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

MAR 4 2011

Dear Reviewer:

In accordance with provisions of the National Environmental Policy Act (NEPA), the National Oceanic and Atmospheric Administration (NOAA) intends to adopt the U.S. Navy's Final Environmental Impact Statement for the Silver Strand Training Complex (FEIS) to comply with NEPA and for agency decision-making purposes. NOAA's proposed action is to issue a one-year incidental harassment authorization (IHA) to the Navy to take marine mammals incidental to its training activities at the Silver Strand Training Complex (SSTC). NOAA has determined that this FEIS adequately analyzes and discloses the environmental impacts associated with this project. Therefore, we enclose this FEIS your review.

This FEIS is prepared pursuant to NEPA to assess the environmental impacts associated with NOAA proceeding with issuing the IHA. NOAA's proposed action (issuance of an IHA) would authorize take of marine mammals incidental to a subset of the activities analyzed in the Navy's SSTC FEIS that are anticipated to result in the take of marine mammals, i.e., those activities that involve underwater detonations and pile driving and removal from training activities. Thus, these components of the Navy's proposed action are interrelated with NOAA's proposed MMPA regulatory action.

NOAA is not required to respond to comments received as a result of issuance of the FEIS. However, comments will be reviewed and considered for their impact on issuance of a record of decision (ROD). Please send comments to the responsible official identified below. The ROD will be made available publicly following final agency action on or after March 4, 2011.

Responsible Official: Eric Schwaab
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National Marine Fisheries Service
National Oceanic and Atmospheric Administration
1315 East-West Highway
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Sincerely,

Paul N. Doremus, Ph.D.
NOAA NEPA Coordinator

Enclosure

# Silver Strand Training Complex

# Environmental Impact Statement

Commander
United States Navy Pacific Fleet

***Lead Agency:***
Department of the Navy

***Action Proponent:***
United States Pacific Fleet

***Cooperating Agency:***
Department of Commerce
National Oceanographic and Atmospheric Administration
National Marine Fisheries Service

Chapters 1-9

**January 2011**

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# COVER SHEET

# ENVIRONMENTAL IMPACT STATEMENT

# SILVER STRAND TRAINING COMPLEX

Lead Agency for the EIS: U.S. Department of the Navy (Navy)

Title of the Proposed Action: Silver Strand Training Complex (SSTC)

Affected Jurisdiction: County of San Diego, Cities of Coronado and Imperial Beach

Designation: Final Environmental Impact Statement (FEIS)

## Abstract

This FEIS has been prepared by the Navy in compliance with the National Environmental Policy Act (NEPA) of 1969 (42 United States Code 4321 et seq.), the Council on Environmental Quality Regulations for Implementing the Procedural Provisions of NEPA (Title 40 Code of Federal Regulations [CFR] Parts 1500-1508), and Navy Procedures for Implementing NEPA (32 CFR 775). Three alternatives are analyzed in this FEIS. The No Action Alternative would continue baseline training activities of the same types, without change in the nature or scope of military activities. Implementation of Alternative 1 would increase training tempo from baseline conditions and add new types of training, conduct existing routine training in additional locations within SSTC established training areas, introduce new platforms and equipment into training, and increase access and availability to existing beach and inland training areas. Alternative 2 is identical to Alternative 1 except that it further increases access to beach training areas.

This FEIS addresses the potential environmental impacts that result or could result from activities under the No Action Alternative, Alternative 1, and Alternative 2. Environmental resource topics evaluated include land use and recreation; geology and soils; air quality; hazardous materials and waste; water resources; acoustic environment (terrestrial); marine biological resources; fish; marine mammals; sea turtles; terrestrial biological resources; birds; cultural resources; transportation and circulation; socioeconomics, environmental justice, and protection of children; and public health and safety.

**Prepared by:** Department of the Navy

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# ES 1 EXECUTIVE SUMMARY

## ES 1.1 INTRODUCTION AND BACKGROUND

The National Environmental Policy Act of 1969 (NEPA) (Title 42 United States Code [U.S.C] 4321 *et seq*.) requires federal agencies to examine the environmental effects of major federal actions in a detailed public document that provides an assessment of the potential effects on human, natural, or physical environment. The United States (U.S.) Department of the Navy (Navy) has prepared this Environmental Impact Statement (EIS) to assess the potential environmental impacts associated with ongoing and proposed naval training activities within the Navy's Silver Strand Training Complex (SSTC) and southern nearshore areas of the Naval Air Station North Island (NASNI). Specifically, the Navy is proposing to continue current training and test and evaluation (T&E) activities conducted within the study area, increase training tempo from baseline conditions, conduct new types of training, conduct current routine training at additional locations within SSTC established training areas, introduce new platforms and equipment, and increase access and availability to existing beach and inland training areas. The Navy is the lead agency for the EIS, and the National Marine Fisheries Service (NMFS) is a cooperating agency for this EIS pursuant to 40 Code of Federal Regulations § 1501.6.

SSTC has been used by the Navy for over 60 years and is located on, and adjacent to, the Silver Strand, a narrow, sandy isthmus separating the San Diego Bay from the Pacific Ocean. SSTC is divided into two non-contiguous areas: SSTC-North (SSTC-N) and SSTC-South (SSTC-S). SSTC-N includes land areas on the northern-half of the Silver Strand peninsula, as well as adjacent nearshore waters of the Pacific Ocean and the San Diego Bay. SSTC-S includes land on the southern-end of the Silver Strand peninsula, as well as adjacent nearshore waters of the Pacific Ocean. SSTC-N and SSTC-S are separated by the Silver Strand State Beach. The NASNI training area is separate from SSTC, but it is used for similar types of training: it is composed of the beaches and near shore waters from Breaker's Beach to Zuniga Jetty, west of the City of Coronado. These areas are depicted in Figure ES-1. The Navy is not proposing to expand the geographic area of SSTC or the NASNI training area.

## ES 1.2 STRATEGIC IMPORTANCE OF THE SSTC

SSTC plays a vital part in the execution of the operational readiness mandate. SSTC has historically been, and continues to be, a critical training range for west coast naval amphibious, special warfare, and mine countermeasure activities.

### ES 1.2.1 SSTC Mission

The mission of SSTC is to support U.S. Navy and Marine Corps amphibious, special warfare, and mine countermeasure training by providing local land, sea, and airspace support services; materiel; and training facilities that will help Naval and Marine Corps forces achieve and maintain the highest level of operational readiness.

### ES 1.2.2 Strategic Attributes of SSTC

SSTC is critical to Navy training programs because of its unique combination of attributes that cannot be duplicated anywhere else in the world. These attributes are described below.

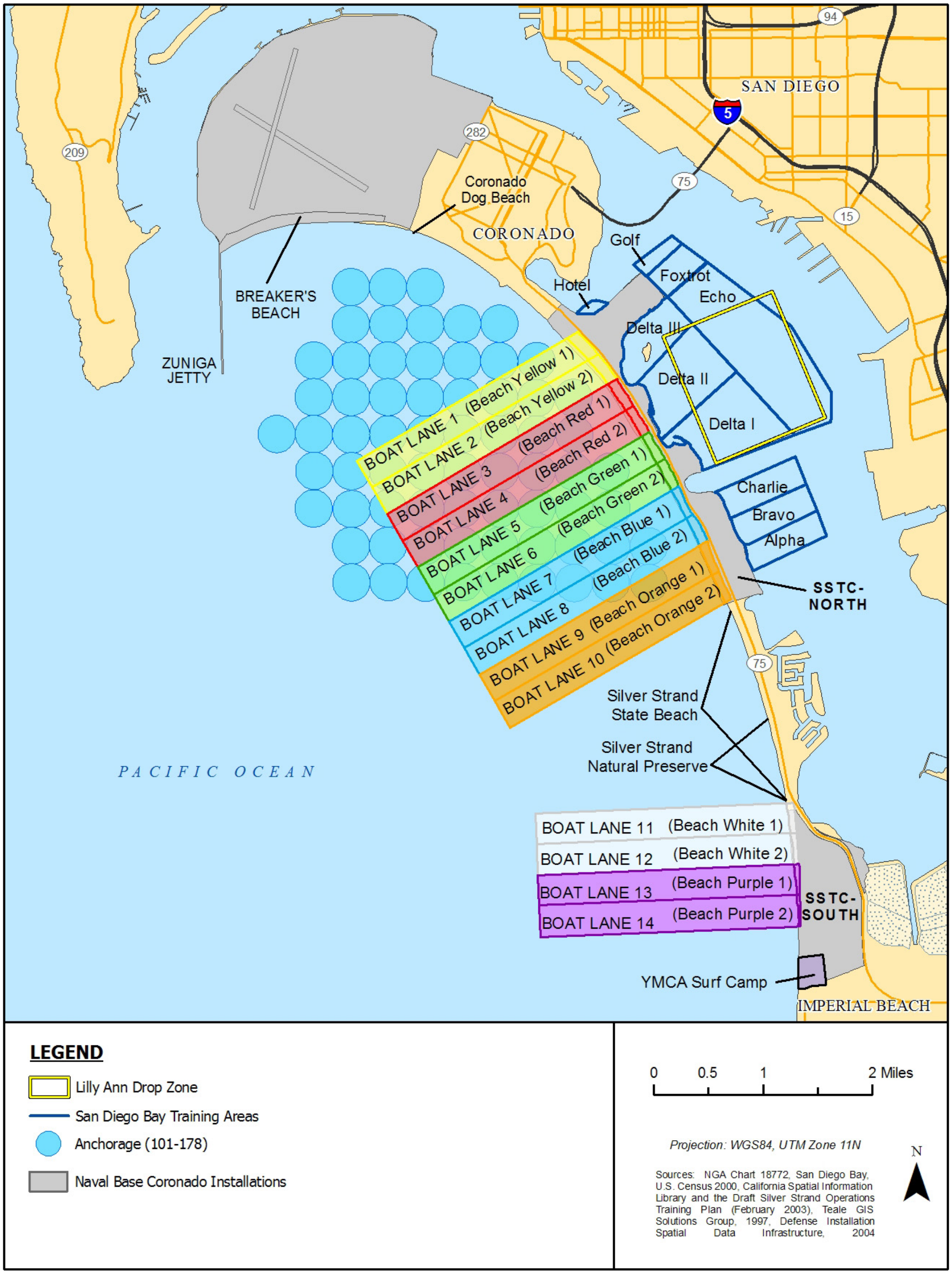


**Figure ES-1: Silver Strand Training Complex**

**Proximity to the Homeport of San Diego**. 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, including two aircraft carriers (with plans to homeport three), over 70 surface combatant ships, amphibious ships, and submarines; several aviation squadrons; and their officers and crews. These naval forces receive support from a range of naval installations in San Diego, including, Naval Amphibious Base (NAB) Coronado, NASNI, Naval Outlying Field (NOLF) Imperial Beach, Naval Base Point Loma, and Naval Base San Diego. SSTC's central location among these installations makes it a critical training range for multiple Navy commands headquartered on the installations. These commands are described in Section 1.4.3.

Local installations provide critical support to training on SSTC, including military command oversight for training, berthing and maintenance for vessels and aircraft used in training, housing for personnel being trained at SSTC, medical services for trainees, depots to supply training materials, and research and development services. The proximity of SSTC to equipment, personnel, facilities, and organizational services that are necessary for training at SSTC, is vital to the execution of Navy training. SSTC provides an efficient training area for commands that are headquartered in San Diego; thereby enabling the commands to meet the aggressive schedules through which groups of trainees are cycled each year. Keeping up with these schedules is necessary to meet the manning needs of the Fleet and ensure readiness for troop deployment.

**Proximity to Other Training Ranges in the Southwest**. The Navy manages a concentrated network of non-contiguous training ranges in the southwestern United States, including SSTC. This network of ranges includes San Clemente Island, NASNI, Naval Air Facility El Centro, NOLF Imperial Beach, Naval Air Station Fallon, Remote Training Site Warner Springs, Naval Air Weapons Station China Lake, Camp Michael Monsoor, Camp Morena and ocean and air areas (Warning Area [W]-291) off the coast of Southern California. This network anchors a west coast regional training capability where each range provides unique, but complementary training resources for different levels and types of training; and it is the most capable and heavily used concentration of Navy ranges in the eastern Pacific Region. Naval forces utilize each of the range areas—depending on the training to be accomplished, and the training resources of a given range. SSTC is a critical asset within this network of training ranges, particularly in amphibious, special warfare, and mine countermeasure training.

**Proximity to Military Families**. The region of San Diego is home to thousands of military families. Per NAVADMIN 300/06 (October 27, 2006), the Navy is required to limit "personnel tempo" (i.e., the amount of time sailors spend away from home). Personnel tempo is an important factor in morale and retention. The proximity of SSTC to NAB Coronado allows the Navy to limit the amount of time sailors spend away from home.

**Training Environment and Terrain**. The temperate, sub-tropical climate—and the attendant dry summers of southern California—allow for year-round training for Fleet readiness. The location of SSTC, with access to the oceanside's rough waters and the bayside's calm waters, allows personnel to start training in a calmer environment, and then quickly transition to more challenging situations as their skills and fitness levels improve. No other training area near San Diego has the capability to train in both calm bayside water and oceanside rough water. Further, SSTC's long stretches of open and accessible beach areas, established ocean anchorages, and the varied and vegetated inland terrain of SSTC-S, make the area ideal for amphibious, special warfare, and mine countermeasure training.

## ES 1.3 PURPOSE AND NEED FOR THE PROPOSED ACTION

The purpose of the Proposed Action is to improve the availability and quality of training opportunities at SSTC—to achieve required levels of operational readiness. In order to meet training requirements, the

Navy proposes to continue current training activities, increase training tempo and types of training, conduct existing routine training at additional locations within SSTC's established training areas, and increase access to and availability of existing beach and inland training areas. A detailed description of the Proposed Action is provided in Chapter 2.

The Proposed Action is needed to provide a training environment consisting of training areas and range facilities with the capacity and capabilities to fully support required training tasks for operational units and military training units / schoolhouses and meet the operational readiness requirements of Title 10 of the United States Code (USC) 5062. The Navy has three primary needs that must be fulfilled to meet these requirements:

- Continue current training and increase the number of existing training activities and introduce new training activities and platforms in support of Fleet Readiness Training Plan (FRTP) and surge requirements;
- Provide assured year-round access and unencumbered use of training areas to meet current and future training needs per the Navy Tactical Task List;
- Provide a training range and training facilities that afford operational commands the flexibility to achieve diverse and realistic training at SSTC.

Each of these three needs is discussed in detail below. The Proposed Action would result in selectively focused, but critical enhancements and increases in training that are necessary if the Navy and Marine Corps are to maintain a state of military readiness commensurate with the national defense mission.

### ES 1.3.1 Need for Increased and Improved Training at SSTC

The Navy and Marine Corps are continuously adapting to meet changing military readiness requirements. Changes within the Navy and Marine Corps are transforming and increasing the training requirements on SSTC:

- The Navy's approach to pre-deployment training (the FRTP), that requires a unit be ready to deploy much earlier in the pre-deployment training cycle (i.e., the ability to surge-deploy). These training cycles require operational commands to increase their training tempos.
- U.S. Special Operations Command's force expansion and restructuring per the December 2002 Office of the Secretary of Defense Program Decision Memorandum, which includes the increase of Naval Special Warfare personnel operating on NAB Coronado, equivalent to one additional Sea, Air, and Land team.
- The Navy's Total Force Strategy, under which Explosive Ordnance Disposal groups have initiated a forcewide realignment, which emphasizes right-place, right-time training and has necessitated expanded use of Southwest Region training venues, including SSTC.
- The Congressionally-authorized increase in Marine Corps personnel to 202,000 active-duty personnel per the 2008 National Defense Authorization Act (Public Law 110 – 181 [H.R. 4986]) will in turn increase the number of Marine Corps personnel cycling through training programs at SSTC.
- Introduction of new platforms, training equipment, and service life extension programs for existing equipment require Navy personnel to begin new training on the new/upgraded equipment, while continuing to train on existing equipment.

These changes reflect increasing and additional requirements for capabilities by overseas operational commanders like U.S. Central Command in Iraq and Afghanistan, and a need to accommodate increases in the number of personnel based in the southern California region. They will require an increase in training types and tempos at SSTC and NASNI and the incorporation of new platforms (e.g., aircraft and equipment) into training at SSTC. They also will require better use of existing training areas within SSTC, but not an expansion of SSTC.

### ES 1.3.2 Need for Year-round Access to Training Areas

In 1983, the Navy initiated consultations under the Endangered Species Act (ESA) because of the Navy's proposed action to construct facilities in support of the Light Airborne Multipurpose System MK III. In preparation for the consultation, the Navy concluded that the proposed action might affect about 68 California least tern nests. California least tern is a federally-listed endangered bird under the ESA, and its displacement triggered a Section 7 consultation under ESA with the U.S. Fish and Wildlife Service (USFWS). One of the results of the consultation was that 75 acres of Navy training beach at Delta North and South (Figure ES-1) were fenced and set aside as California least tern nesting areas. In 1984, the Delta beaches were formally designated as a least tern preserve and are not part of the areas utilized under the Proposed Action.

Since then, the California least tern population has increased on SSTC, now reaching over 1,400 nests, with the majority of those nests occurring on the Delta Beaches. In addition, the California least tern has expanded its nesting range outside of Delta North and South, into and throughout SSTC-N's oceanside beach training lanes (Lanes 1 through 10). Throughout this period, the Navy has engaged in recurring ESA Section 7 consultations with the USFWS, with attention to ongoing military training on these lanes, and has implemented varying strategies to adapt to the growing California least tern nesting population and evolving Navy training needs at SSTC. These recurring consultations were conducted in parallel with the development of this EIS.

Under biological opinion FWS-SDG-3452.3 (March 10, 2005) and associated extensions, the Navy sets aside three beach training lanes (Lanes 8, 9, and 10) for California least tern nesting from April through September each year, in addition to expanded Delta North and South areas. The Navy restricts its training on these three training beaches for approximately 6 months out of the year.

In anticipation of potential increased training at SSTC, the Navy has modeled future training projections to assess its near-future needs for the SSTC-N beach training areas. Results showed that the remaining seven SSTC-N oceanside beach lanes (Lanes 1 through 7) will be insufficient to support future training tempo requirements. As such, the Navy needs additional year-round training space to support future deployment schedules and personal tempo requirements.

### ES 1.3.3 Need for Flexibility and Realistic Training

Military commands use SSTC to accomplish a wide variety of training. They value SSTC for its many different attributes, including unique site improvements as well as the attributes discussed in Section 1.2.2. Each of these military commands has to be able to quickly adapt their training on SSTC to address ever-changing Navy requirements for combat readiness overseas. The commands need a range that realistically simulates environments that operators will encounter overseas, as well as a range that allows them the freedom to quickly alter their training to meet operational needs overseas.

SSTC is located in a populated coastal area; its use for realistic military training can be constrained by adjacent residential, commercial, recreational, cultural, and sensitive natural resource uses. Operational constraints on training areas at SSTC make it challenging for Navy commands to support emerging and expected future training requirements. A training range that realistically simulates environments that operators will encounter overseas, and prevents encumbrances that adversely affect training, is an ongoing need of commands that train at SSTC.

## ES 1.4 THE ENVIRONMENTAL REVIEW PROCESS

NEPA requires federal agencies to examine the environmental effects of their Proposed Actions. This EIS is a detailed public document that provides an assessment of the potential environmental impacts associated with a proposed major federal action. The impacts to be analyzed are those that occur to the human environment, including natural and physical resources. The Navy is the lead agency for this EIS. NMFS is a cooperating agency, pursuant to 40 CFR Section 1501.6. NMFS has jurisdiction by law and special expertise on environmental issues that are being addressed in this EIS.

### ES 1.4.1 NEPA Public Participation

The first step in the NEPA process is the publication of the Notice of Intent (NOI) by the action proponent, after the decision is made to prepare an EIS. The NOI provides an overview of the proposed action and invites the public to participate in identifying the significant issues deserving of study (i.e., participate in scoping). The Navy initiated the process for determining the scope of issues by publishing a NOI to prepare an EIS in the *Federal Register* (66 FR 41009) on August 6, 2001. Copies of the NOI and the Agency Scoping Package were mailed to local, state, and federal elected officials; regulatory agencies; local municipal jurisdictions; public service providers; and other parties known or expected to be interested in the Proposed Action. A copy of the NOI is provided in Appendix A.

Scoping is an early and open process for developing the scope of issues to be addressed in the EIS and for identifying issues related to a Proposed Action. During scoping, the public helps define and prioritize issues; the public conveys these issues to the Navy through written comments. As part of the EIS scoping process, the Navy held meetings on August 28, 2001 in Coronado, CA and August 29, 2001 in Imperial Beach; the meetings were designed to inform the public of the Proposed Action and to solicit the public's participation and comments. The meetings were advertised and the NOI was published in the *San Diego Union-Tribune* from August 6-8, 2001, in the *Coronado Eagle* on August 8, 2001, and in the *Imperial Beach Times* on August 9, 2001. At each meeting, Navy representatives provided an overview of the Proposed Action and alternatives, the NEPA process, training exercises at SSTC, and potential environmental issues on SSTC. Comment sheets were distributed for the public to submit their concerns and comments. Also, a court reporter was available at each meeting to record oral comments.

Independent of the public scoping meetings, the Navy conducted additional focused interviews. These interviews occurred during the 45-day comment period (and the additional 30 day extension of the comment period) and were designed to gather input from local city officials, regulatory agencies, and environmental organizations.

Participants in the scoping process identified several areas of interest and concern, as well as ideas for alternatives to the Proposed Action, which are addressed throughout this EIS. The scoping process resulted in commentary on a variety of topics; the majority of comments received were related to the description of alternatives, other training alternatives, snowy plovers and least terns, marine resources, threatened and endangered species, and effects on environmental health, safety, and recreation.

The Notice of Availability of the Draft EIS and Notice of Public Hearings were published in the Federal Register on January 22, 2010 (75 FR 1768) and notices were placed in the *San Diego Union-Tribune*, *Coronado Eagle*, and in the *Imperial Beach Times* announcing the availability of the EIS. The Navy held two public hearings, February 23 in Imperial Beach, CA, and February 24, 2010, in Coronado, CA. After receiving initial comments during the 45-day comment period, the Navy extended the response period by 30 days to allow the public additional time to review and comment on the Draft EIS. The Draft EIS was distributed to those individuals, agencies, and associations who asked to be notified during the public scoping period, as well as to members of Congress, the Governor of California, and officials in the coastal region surrounding the SSTC Study Area. Additionally, the EIS was made available for general review at two information repositories in the local area, and on the project website (www.silverstrandtrainingcomplexeis.com). A total of 108 individuals and 22 agencies and organizations submitted comments on the Draft EIS.

This final EIS responds to public comments received on the EIS. Responses to public comments may take various forms as necessary, including correction of data, clarifications of and modifications to analytical approaches, and inclusion of additional data or analyses.

The Notice of Availability of the Final EIS was published in the Federal Register and notices were placed in the *San Diego Union-Tribune*, *Coronado Eagle*, and in the *Imperial Beach Times* announcing the availability of the Final EIS. The Notice of Availability of the Final EIS was published in the Federal Register by the EPA. Notification of the availability of the Final EIS was sent to interested individuals, agencies, and associations, as well as elected and other public officials. The Final EIS was distributed to those individuals, agencies, and associations who asked to be notified during the public comment period and at public hearings, as well as members of Congress, the Governor of California, and officials in the coastal region surrounding the SSTC Study Area. Additionally, the SSTC EIS was made available at two information repositories in the local area as well as on the project website (www.silverstrandtrainingcomplexeis.com).

Finally, a Record of Decision (ROD) will be signed by the Assistant Secretary of the Navy (Energy, Installations & Environment) and be issued, no sooner than 30 days after this Final EIS is made available to the public. The ROD summarizes the Navy's decision and identifies the selected alternative, describes the public involvement and agency decision-making processes, and presents commitments to specific mitigation measures.

## ES 1.5 OTHER ENVIRONMENTAL REQUIREMENTS CONSIDERED

The Navy must comply with a variety of other federal environmental laws, regulations, and Executive Orders (EOs). These include (among other applicable laws and regulations) the following:

- Clean Air Act
- Coastal Zone Management Act
- Endangered Species Act
- EO 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations
- EO 13045, Environmental Health and Safety Risks to Children
- Resource Conservation and Recovery Act
- Federal Water Pollution Control Act (Clean Water Act)
- Magnuson-Stevens Fishery Conservation and Management Act
- Marine Mammal Protection Act
- Migratory Bird Treaty Act
- National Historic Preservation Act
- Rivers and Harbors Act

The Navy has consulted with regulatory agencies as appropriate during the NEPA process and prior to implementation of the Proposed Action to ensure requirements are met. A full description is provided in Chapter 6 and Appendix G provides a list of the Silver Strand Training Complex (SSTC) regulatory agency consultation documentation. Agency correspondence and supporting documentation can be found on the SSTC EIS website at www.silverstrandtrainingcomplexeis.com.

In addition, laws and regulations of the State of California appropriate to Navy actions are identified and addressed in the EIS. The EIS will facilitate compliance with applicable, appropriate state laws and regulations.

## ES 1.6 PROPOSED ACTION AND ALTERNATIVES

As presented in Chapter 1, the Navy proposes to implement actions within the SSTC. There are five main components of the Proposed Action:

- Continuation of current training and T&E activities conducted within the study area;
- Increase in training tempo from baseline conditions and additions to types of training;
- Carrying out of existing, routine training at additional locations within SSTC established training areas;
- Introduction of new platforms and equipment;
- Increased access and availability to existing beach and inland training areas.

Through implementation of the components listed above, the Proposed Action would support mission-oriented requirements for SSTC through an increase in diverse and realistic training and improved accessibility to training areas.

### ES 1.6.1 Alternatives Development

NEPA implementing regulations provide guidance on the consideration of alternatives in an EIS. The Navy is required to rigorously explore and objectively evaluate all reasonable project alternatives; further, the Navy is required to briefly discuss the reasons for not evaluating those alternatives that were eliminated from further consideration and detailed study (40 Code of Federal Regulations [CFR] 1502.14).

Alternatives must also include a No Action Alternative. The No Action Alternative ensures that agencies compare the potential impacts of a proposed major federal action to the known impacts of maintaining the status quo. The potential impacts of the No Action Alternative are compared to the potential impacts from activities proposed under Alternative 1 and Alternative 2.

### ES 1.6.2 Criteria for Developing Alternatives

The alternatives were developed by the Navy after careful assessment by subject-matter experts, including units and commands that utilize SSTC, Navy environmental managers and scientists, and the consideration of comments received during scoping. The Navy has developed a set of criteria for use in assessing whether a possible alternative meets the purpose of and need for the Proposed Action (refer to Section 1.5):

- Must meet the requirements of individual and unit-level training (including schoolhouse training)[1];

[1] Schoolhouse training is typically conducted in formal courses with syllabi and instructors including both classroom and field work.

- Must have sufficient available and suitable training space to simultaneously accommodate the training needs of all of the operational users described in Section 1.4.3 so that they can achieve training tempo requirements based on Fleet deployment schedules;
- Must meet future training requirements with year-round, assured access to San Diego Bay, ocean, beach, and inland training areas;
- Must provide a realistic training environment that simulates real world littoral combat conditions and is free of man-made restrictions/objects that interfere with preparing servicemen for operations in real-world conditions;
- Must complete the full range of required training elements at SSTC; and
- Must provide co-location of commands, equipment, facilities, and infrastructure that support existing and future training to meet training and personnel tempo requirements.

Three alternatives are analyzed in the EIS: (1) The No Action Alternative, (2) Alternative 1, and (3) Alternative 2. The No Action Alternative would continue baseline training activities. The Navy would also continue to operate under existing access restrictions. Alternative 1 increases training tempo from baseline conditions, introduces new platforms and equipment into training, and decreases access restrictions and encumbrances on training areas. Alternative 2 is identical to Alternative 1 except that the Navy would utilize all ocean beaches along SSTC-N and SSTC-S, and all bayside training beaches, except the Delta North and South nesting habitat, for continuous, year-round training. Further detail regarding the alternatives considered in the EIS follows.

### ES 1.6.3 Alternatives Eliminated from Further Consideration

Having identified criteria for generating alternatives for consideration in the EIS, the Navy eliminated several alternatives from further consideration after initial review to satisfy 40 CFR Section 1502.14(a). Specifically, the following potential alternatives were not carried forward for analysis:

- Alternate Training Complex Locations
- Training Relocation to SSTC-S
- Training Reductions
- Simulated Training
- Construction and Use of Demolition Pit at SSTC-S
- Allow Unrestricted Usage of Training Lanes 8, 9, and 10 if California Least Tern Nesting Threshold is Reached
- Creating More Than or Less Than 22 Concurrent Buffered and Marked Avoidance Areas for Western Snowy Plover

Rationales for eliminating these alternatives are provided in Chapter 2.

## ES 1.7 No Action Alternative: Baseline Training and Access Restrictions

The Navy has been using SSTC for over 60 years. Under the No Action Alternative, training activities would continue at baseline levels. SSTC would not accommodate an increase in training tempo or type required to execute the FRTP or introduce platforms or equipment. Under the No Action Alternative Navy would not accommodate training requirements for repositioned forces in the Southern California area. In addition, under the No Action Alternative, training access restrictions, including no training in vernal pools as well as seasonal restrictions on Blue 2, Orange 1, and Orange 2 would remain unchanged. Evaluation of the No Action Alternative in the EIS provides a baseline for assessing environmental impacts of Alternative 1 (Preferred Alternative) and Alternative 2, as described in the following subsections.

Each military training activity described in Chapter 2 of the EIS meets a requirement that can be ultimately traced to requirements from the National Command Authority (the President and the Secretary of Defense or their duly deputized alternates or successors). Over the years, the tempo and types of training have fluctuated at SSTC due to changing requirements brought about by the dynamic nature of international events, advances in warfighting doctrine and procedures, and force structure changes. Such developments have influenced the frequency, duration, intensity, and location of required training. The factors influencing tempo and types of training are fluid in nature, and will continue to cause fluctuations in training activities at SSTC. Accordingly, training data used throughout the EIS are a representative baseline for evaluating impacts that may result from the proposed training activities under the No Action Alternative.

With reference to the selection criteria identified in Section ES 1.6.2, the No Action Alternative satisfies current Fleet training requirements; however, because the No Action Alternative does not propose increases in training tempo it does not accommodate training associated with the changes discussed in Section ES 1.3.1. It also does not introduce new platforms and equipment into the Fleet. Nevertheless, the No Action Alternative provides a valuable baseline against which to assess Alternative 1 and Alternative 2.

## ES 1.8 ALTERNATIVE 1: INCREASE TRAINING AND ACCESS TO SSTC TRAINING AREAS (PREFERRED ALTERNATIVE)

Alternative 1, the Navy's preferred alternative, is designed to meet Navy and Department of Defense (DoD) current and near-term operational training requirements. It meets the selection criteria listed in Section 2.1.2. Under Alternative 1, the Navy would increase the tempo of training, introduce new platforms and systems into training, conduct existing routine training at additional locations within SSTC training areas, introduce new platforms and equipment, and increase access and availability to SSTC training areas. The tempo of training would be increased to meet 100 percent of Navy NTA requirements. This represents an increase from the baseline tempo of 3,926 activities annually to approximately 5,343 activities annually. New platforms and equipment would include replacement of Amphibious Assault Vehicles with Expeditionary Fighting Vehicles, an updated Offshore Petroleum Discharge System, and the MH-60S Seahawk Multi-Mission helicopter.

Access and availability to SSTC training areas would be increased through opening of beach lanes Blue 2, Orange 1 and/or Orange 2 for training during the nesting season if one of the following two criteria are met: (1) Beach lanes Red 1 and 2, Green 1 and 2, and Blue 1 are being utilized and the additional training lane(s) are needed, (2) Attributes of those lane(s) make them more suitable for meeting training needs than other available training lanes Examples of lane attributes which may allow usage of Blue 2, Orange 1 and/or Orange 2 include but would not necessarily be limited to: nearshore in-water conditions such as the presence of sand bars or holes, beach conditions such as slope and depth of the beach, distance from other training activities occurring on SSTC-N oceanside beach and boat lanes, and a need for diversity in training locations. The Navy would also mark and buffer no more than 22 concurrent western snowy plover nests for avoidance on SSTC-N and SSTC-S oceanside beaches plus any additional nests that exceed 22 that are initiated in beach lanes Orange 1 and Orange 2. The Navy would also allow limited training involving foot traffic, but not vehicle traffic, in the vernal pools when vernal pool conditions are determined to be dry.

## ES 1.9 ALTERNATIVE 2: INCREASE TRAINING AND FURTHER ENHANCE ACCESS TO SSTC TRAINING AREAS

Alternative 2 meets Navy and DoD current and near-term operational training requirements, and further enhances training capabilities at SSTC. Under Alternative 2, proposed training tempo and types of training, training location and introduction of platforms and equipment into training, would be the same as described under Alternative 1. The Navy would increase the tempo of training to meet 100 percent of Navy NTA requirements. As described under Alternative 1, this would represent an increase from the baseline tempo of 3,926 activities to approximately 5,543 activities annually. The only differences between Alternative 1 and Alternative 2 are additional access and availability of SSTC-N training lanes. Under Alternative 2, the Navy would fully utilize all 7,000 yards of ocean beaches along SSTC-N and SSTC-S, and all bayside training beaches, except the Delta North and South nesting habitat (i.e., Alpha, Bravo, Charlie, Echo, Foxtrot, Golf, and Hotel) for continuous, year-round training. The Navy would continue to conduct existing management practice on the SSTC training beaches including nest relocation, predator management and control, habitat modification, site preparation for maintenance, nest substrate enhancement, signage and education, recreational use restrictions, and rearing of collected eggs, injured and sick individuals.

## ES 1.10 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

The EIS describes existing environmental conditions and assesses the environmental effects of the Proposed Action and alternatives. The affected environment and environmental consequences are described and analyzed according to categories of resources. The categories of resources addressed, and their respective section numbers, in the EIS are listed within Table ES-1.

In the environmental impact analysis process, the resources analyzed are identified and the expected geographic scope of potential impacts for each resource, known as the resource's region of influence, is defined. The discussion and analysis, organized by resource area, covers the ocean lanes of the SSTC, the beach areas of SSTC-N and SSTC-S, the bayside training areas, the inland areas of SSTC-S, and the southern beaches and nearshore waters of NASNI to the extent affected resources or potential impacts are present.

**Table ES-1: Categories of Resources Addressed in the EIS**

| | |
|---|---|
| Land Use (3.1) | Marine Mammals (3.9) |
| Geology and Soils (3.2) | Sea Turtles (3.10) |
| Air Quality (3.3) | Terrestrial Biological Resources (3.11) |
| Hazardous Materials and Waste (3.4) | Birds (3.12) |
| Water Resources (3.5) | Cultural Resources (3.13) |
| Acoustic Environment (Terrestrial) (3.6) | Transportation and Circulation (3.14) |
| Marine Biological Resources (3.7) | Socioeconomics, Environmental Justice, and Protection of Children (3.15) |
| Fish (3.8) | Public Health and Safety (3.16) |

The Navy has a comprehensive management program that considers biological resources, cultural resources, environmental compliance, and environmental resource education and interpretation. The basis for Navy environmental resource management at SSTC is a holistic, long-term view of human activities in conjunction with air/water quality, cultural resources, land uses, noise ordnances, waste management, or other marine or terrestrial biological resources such as, sensitive habitats and federally listed species under the Endangered Species Act (ESA). The Navy is responsible for compliance with applicable federal environmental laws, rules, regulations, policies, and guidelines designed to protect marine and terrestrial environmental and cultural resources at SSTC, concurrent with the Navy's sustained utilization of SSTC for training. Environmental programs at SSTC balance the need for environmental protection with the training mission, such that naval forces maximize the benefits of SSTC training assets while minimizing adverse effects on the environment.

To achieve this balance, the Navy monitors the effects of training activities on environmental resources, using an adaptive management strategy to modify resource management in response to the ongoing influx and evaluation of monitoring data. Through this approach, the Navy's environmental resource managers acquire information to identify potential impacts in a timely manner, thus allowing for ongoing adjustments to training and/or resource management while keeping the training mission on schedule to meet necessary training goals. The monitoring effort is focused not only on the environmental resource, such as a protected species, but also on the operational and administrative setting for training activities potentially affecting the resource.

## ES 1.11 SUMMARY OF EFFECTS

Environmental effects which may result from the implementation of the Navy's Proposed Action or alternatives is summarized in Table ES-2. A summary of effects is presented for each of the resource categories previously listed in Table ES-1.

## ES 1.12 CUMULATIVE IMPACTS

Cumulative impacts were analyzed by following NEPA of 1969, Council on Environmental Quality (CEQ) regulations, and CEQ guidance. Identifiable effects of actions occurring in the past and present were analyzed along with reasonably foreseeable future actions to assess additive impacts of the Proposed Action. Past, present, and planned projects were considered, as well as other activities occurring in the region, including marine traffic, activities contributing to water pollution, and air quality emissions. Cumulative effects were identified for the resource areas and determined to be minimal for land use, air quality, marine biological resources, fish, sea turtles, marine mammals, terrestrial biological resources, birds, cultural resources, transportation and circulation, socioeconomics, and public health and safety. Cumulative effects to geology and soils would be negligible relative to the scale of natural processes operating in the region of influence. Generation of hazardous materials and wastes would be managed as part of the overall hazardous waste stream and existing physical capacities would be sufficient to handle cumulative additions to the existing waste stream. Compliance with state and federal regulations would limit the release of pollutants to *de minimis* amounts, which would not result in substantial cumulative effects to water resources. At SSTC-S, training would also increase the number of intrusive noise events; acoustic effects would result even in the absence of other cumulative projects.

## ES 1.13 MITIGATION MEASURES

NEPA regulations require that the federal agency study means to mitigate adverse environmental impacts of the Proposed Action or alternatives (40 CFR Part 1502.16). Additionally, an EIS is to include study of appropriate mitigation measures not already included in the Proposed Action or alternatives (40 CFR Part 1502.14[f]). Each of the alternatives, including the Proposed Action considered in the EIS, includes mitigation measures intended to reduce the environmental effects of Navy activities. Mitigation measures are discussed throughout the EIS in connection with affected resources, and are also addressed in Chapter 5, Mitigation.

SSTC is located in a populated coastal area, and its use for realistic military training is constrained by adjacent residential, commercial, recreational, cultural, and sensitive natural resource uses. As part of the Navy's commitment to sustainable use of resources and environmental stewardship, the Navy incorporates measures that are protective of the environment into all of its activities. These include employment of best management practices, standard operating procedures, adoption of conservation recommendations, and other measures that mitigate the impacts of Navy activities on the environment. Some of these measures are generally applicable and others are designed to apply to certain geographic areas during certain times of year and for specific types of Navy training. Mitigation measures covering habitats and species occurring in the SSTC have been developed through various environmental analyses conducted by the Navy for land and sea ranges and adjacent coastal waters. These mitigation measures are issued to units and commands participating in an exercise.

**Table ES-2: Summary of Effects**

| Resource | No Action Alternative | Alternative 1 | Alternative 2 |
|---|---|---|---|
| **3.1 Land Use** | • Current Navy activities include long-established military land uses, and the Navy allows the public access to the public beaches adjacent to active training areas. Therefore, public would have ample access to the beach. | • Alternative 1 would include activities that are consistent with long-established military land uses and the Navy allows the public access to public beaches adjacent to active training areas. Use of training areas would increase under Alternative 1. | • The effects of Alternative 2 on land use would be similar to the effects described under Alternative 1. The Navy allows the public access to public beaches adjacent to active training areas. |
| | **Mitigation:** There are mitigation measures in place for other resources (e.g., Acoustic Environment [Section 3.6], Biological Resources [Sections 3.7-3.12], Public Health and Safety [Section 3.16]) that also apply to land use on SSTC, mainly through the stipulation of training parameters. | | |
| **3.2 Geology and Soils** | • Only previously disturbed land areas are affected. Soil disturbances are minor and affect only portions of the area.<br>• Sandy beaches are disturbed; however, the impacts are temporary.<br>• Ocean bottom sediments are disturbed by underwater detonations, but the areas affected are small. | • Proposed training activities would be comparable in type to existing activities, but the level of activity of some activities would increase. The level of disturbance of beach and inland surfaces would incrementally increase the potential for soil erosion, but would still be minor and affect only portions of the area.<br>• Underwater detonations would affect a larger area of bottom sediments than under the No Action Alternative, but the area affected would be small. | • With regard to soils and sediments, the effects of this alternative would be similar to those described for Alternative 1. Overall, the effects of Alternative 2 would be more widely dispersed and training areas formerly avoided would experience a slightly increased level of use over Alternative 1. |
| | **Mitigation:**<br>• Currently, sand (of a quality that is appropriate for nesting California least terns) is periodically replenished on Delta beaches when available, vegetation on the back dunes of SSTC beaches is maintained to reduce water and wind erosion, and in inland SSTC-S areas, vehicles are restricted to existing roads to minimize the loss of vegetation.<br>• Currently, disturbed areas of beach are restored as needed with bulldozers.<br>• The NBC Integrated Natural Resources Management Plan (INRMP) includes strategies to minimize erosion on SSTC and the Navy works to implement these strategies. | | |

**Table ES-2: Summary of Effects (Continued)**

| Resource | No Action Alternative | Alternative 1 | Alternative 2 |
|---|---|---|---|
| **3.3 Air Quality** | • No increases in emissions above baseline. | • Emission increases would be less than the *de minimis* thresholds under the General Conformity Rule. No conformity determination is required. | • Emission increases would be less than the *de minimis* thresholds under the General Conformity Rule. No conformity determination is required. |
| | **Mitigation:** The Navy currently has a comprehensive air quality management program. Mitigation measures that are part of the Navy's air quality management practices are implemented at SSTC. Areas that are used for training exercises are typically vegetated, which reduces fugitive dust emissions associated with ground disturbance. Aircraft, marine vessels, ground vehicles, and Tactical Support Equipment are required to be maintained and meet applicable emission standards (such as smog certification for on-road vehicles) in accordance with state requirements. | | |
| **3.4 Hazardous Materials and Wastes** | • Use of expendable training materials deposits small amounts of nonhazardous inorganic materials on the land ranges which are collected where feasible at the conclusion of training. Only trace amounts of nonhazardous organic compounds are left following a detonation of explosives and are not expected to affect surrounding biological or physical resources.<br>• The Navy's existing hazardous materials management system is sufficient for handling hazardous materials needed for the baseline training activities.<br>• The Navy's existing hazardous waste system is sufficient for handling hazardous wastes generated by baseline training activities. | • Under this alternative, the amounts of expended training materials would increase. The weight of expended flare and smoke canister residues would increase and the amounts of residues from detonations of underwater explosives would increase. Despite these increases, the amounts of expended materials would not have an adverse effect on physical or biological aquatic resources.<br>• The Navy's existing hazardous materials management system is sufficient for handling hazardous materials needed for the proposed training activities.<br>• The Navy's existing hazardous waste management system is sufficient for handling of wastes generated by the Proposed Action. | • Impacts would be similar to those for Alternative 1. |
| | **Mitigation:** The Navy's general instructions (e.g., Chief of Naval Operations Instruction [OPNAVINST] 5090.1) and training activity planning and review processes serve to ensure that hazardous materials and hazardous wastes are stored and handled appropriately. The Navy's current mitigation measures include its business plan, Hazardous Waste Management Plan (*HWMP)*, *NBC Hazardous Substance Release Integrated Contingency Plan* (DoN 2008), and *Regional Explosive HWMP*. Navy personnel also collect expended training materials at the conclusion of a training activity to the extent practicable. | | |

**Table ES-2: Summary of Effects (Continued)**

| Resource | No Action Alternative | Alternative 1 | Alternative 2 |
|---|---|---|---|
| **3.5 Water Resources** | • No effects on surface water or groundwater hydrology (Silver Strand peninsula has no potable surface or groundwaters, so SSTC training activities do not affect freshwater water quality)<br>• Consistent with *Basin Plan* and NRWQC<br>• Releases of munitions constituents and other expended materials during training activities have no measurable effects on water quality<br>• No long-term degradation of marine, surface, or groundwater quality<br>• Consistent with public uses of state or federal waters | • No effects on surface water or groundwater hydrology (Silver Strand peninsula has no potable surface or groundwaters, so SSTC training activities do not affect freshwater water quality)<br>• Consistent with *Basin Plan* and NRWQC<br>• Increased releases of munitions constituents and other expended materials during training activities would not measurably affect water quality<br>• No long-term degradation of marine, surface, or groundwater quality<br>• Increased use of water areas for training would be consistent with public uses of state or federal waters | • Vehicle, boat, and helicopter use and amphibious landings would increase similar to Alternative 1. Effects are the same as described for Alternative 1. |
| | **Mitigation:** The Navy's current practices affecting water quality, primarily hazardous materials handling and waste disposal practices, are based on requirements in OPNAVINST 5090.1. Those requirements, in turn, were developed primarily to comply with federal environmental regulations. Efforts to preserve vegetation on the backsides of dunes along the shoreline may reduce erosion and thus reduce transport of sediments into adjacent surface waters. Collection of spent training materials at the conclusion of training activities also may incrementally reduce the amounts of contaminants transported into adjacent waters.<br><br>With respect to water use, the Navy mitigates potential effects by avoiding washing causeway pier sections in the ocean and by pumping seawater through its Offshore Petroleum Discharge System during training instead of using petroleum products. OPNAVINST also includes guidance on shipboard operations afloat. | | |

**Table ES-2: Summary of Effects (Continued)**

| Resource | No Action Alternative | Alternative 1 | Alternative 2 |
|---|---|---|---|
| **3.6 Acoustic Environment** | • Existing ambient sound levels include sounds from various sources. Training at SSTC-S occasionally creates intrusive sound for short periods, especially during Amphibious Raid and breacher training. Training at SSTC-N occasionally creates intrusive sound for short periods, especially during Elevated Causeway (ELCAS) installation training. Helicopter overflights and ship pass-bys of populated land areas would be audible for a few minutes per day in any one area, without contributing substantially to the long-term average sound level. Small arms (blanks) firing occasionally is audible for short periods in portions of the community. Routine on-site and off-site training-related activities, such as the operation of powered vehicles and equipment, add incrementally to the ambient background sound level, especially during weekdays. Taken together, these sound sources affect the acoustic environment of Silver Strand peninsula. | • Sound levels generated by training would remain the same as the No Action Alternative, but training events producing sound would increase in frequency. Alternative 1 would increase the frequency of aircraft and amphibious vehicle training, ELCAS pile driving, shotgun breacher activities, and use of blanks on the beach. | • The effects of Alternative 2 on the acoustical environment would be substantially the same as the effects described under Alternative 1. |
| | **Mitigation:** Activity planning often considers location (e.g., Breacher training activities are located in inland areas) and time of day. The Navy notifies local emergency personnel prior to exercises that include pyrotechnics or blanks. Call-outs during physical conditioning training are minimized at night and when in residential areas. | | |

**Table ES-2: Summary of Effects (Continued)**

| Resource | No Action Alternative | Alternative 1 | Alternative 2 |
|---|---|---|---|
| **3.7 Marine Biological Resources** | • On the beach, vehicle use, boat landings, helicopter landings, and foot traffic associated with a range of activities could cause temporary localized disturbances of infaunal invertebrates of the sand.<br>• Minimal disturbance of sandy bottom habitat and increased turbidity from amphibious landings and underwater demolitions.<br>• A total of 1.13 acres of eelgrass habitat may be impacted in the designated training lane within the Bravo training area.<br>• With the current protective measures, no adverse effect to EFH and their associated managed species are anticipated during amphibious landing and beach construction activities within the Bravo training area. | • Vehicle, boat, and helicopter use and amphibious landings would increase; however, effects are the same as described for the No Action Alternative. Amphibious activities conducted on the bayside would be limited to the same designated training lane within the Bravo training area.<br>• With the current and proposed protective measures, no adverse effect to EFH and their associated managed species are anticipated during amphibious landing and beach construction activities within the Bravo training area. | • Vehicle, boat, and helicopter use and amphibious landings would increase similar to Alternative 1. Effects are the same as described for the No Action Alternative.<br>• With the current and proposed protective measures, no adverse effect to EFH and their associated managed species are anticipated during amphibious landing and beach construction activities within the Bravo training area. |
| | **Mitigation:** Management practices are in place for jurisdictional waters and special aquatic sites. Additionally, the Navy has consulted with NMFS on EFH. Potential impacts of up to 1.13 acres of eelgrass habitat/EFH for larger boat landings, ELCAS, and causeway insertions in the designated training lane on Bravo Beach will be mitigated consistent with the Southern California Eelgrass Mitigation Policy. This mitigation will occur at an established Navy Eelgrass Mitigation Sites and be drawn as part of the Navy Eelgrass Mitigation Bank.<br><br>As a result of consultation with the NMFS for EFH, the Navy will conduct a new bottom habitat mapping survey to more accurately detail potential habitat types (ex., sand, cobble, rocks) within the oceanside SSTC boat lanes. This effort, scheduled to begin in 2011, is designed to update bottom type classification at finer resolution and spatial scales than previous California State funded surveys from 2002. The goal from this Navy funded survey would be to provide information to NMFS on habitat types within SSTC, and to Navy commands conducting underwater detonations at SSTC for consideration in selection of appropriate bottom-laid detonation sites. | | |

**Table ES-2: Summary of Effects (Continued)**

| Resource | No Action Alternative | Alternative 1 | Alternative 2 |
|---|---|---|---|
| **3.8 Fish** | • Small numbers of fish would be killed by shock waves from underwater detonations associated with the SSTC. However, underwater detonations would occur primarily in low-use habitats.<br>• Noise associated with marine vessels is unlikely to affect fish as source levels from these sources are below those known to cause injury. Noise associated with pile driving would have some lethal and sublethal effects to fish but impacts would be localized due to the nature of the activity.<br>• Groundfish are unlikely to be affected by activities in shallow waters.<br>• With the current protective measures, no adverse effect to EFH and their associated managed species are anticipated. | • Increases in pile driving and underwater detonation activities would increase the lethal and sublethal effect to fish species but fish assemblages would not be expected to be affected.<br>• With the proposed protective measures, no adverse effect to EFH and their associated managed species are anticipated. | • Increases in pile driving and underwater detonation activities would increase the lethal and sublethal effect to fish species but fish assemblages would not be expected to be affected.<br>• With the proposed protective measures, no adverse effect to EFH and their associated managed species are anticipated. |
| | **Mitigation:**<br>• Habitat mitigation for intertidal and subtidal areas, including eelgrass, provide a degree of mitigation for fish species documented to reside within those habitats.<br>• The mitigation for 1.13 acres of lost eelgrass habitat would provide alternative habitat for fish species potentially lost or displaced from eelgrass by activities described in this section, thus mitigating effects to fish. | | |

**Table ES-2: Summary of Effects (Continued)**

| Resource | No Action Alternative | Alternative 1 | Alternative 2 |
|---|---|---|---|
| **3.8 Fish (Continued)** | • As a result of the EFH consultation with the NMFS, the Navy will conduct a new bottom habitat mapping survey to more accurately detail potential habitat types (ex., sand, cobble, rocks) within the oceanside SSTC boat lanes. Similar to the measures used to avoid sensitive habitats when selecting underwater explosive device detonation sites, the nearshore habitat survey data will also be used to ensure the OPDS system is not placed within any sensitive habitats.<br><br>• The Navy will conduct April to May pre-event surveys for grunion prior to SSTC training events that could to disturb intertidal beach areas. From Table 2-1, events identified for grunion pre-event surveys include 41- Causeway Pier Insertion and Retraction training (max. of 10 per year), and 42-ELCAS (max. of four per year). These training events generally occur within only a few boat\beach lanes in SSTC-N and can occur throughout the year. For events that have a requirement to occur in April and May, the Navy will use predicted grunion spawning periods obtained from the California Department of Fish and Game (http://www.dfg.ca.gov/marine/grunionschedule.asp ) to anticipate times to survey 10-14 days prior to the next ELCAS or Causeway Pier Insertion and Retraction.<br><br>• This survey will identify if grunion spawning occurred or did not occur on the beach area scheduled for training. If grunion spawning is documented, then a determination on the spatial extent of spawn across the planned training area and magnitude of spawning (on the standard grunion 0-5 spawning scale) will be made. For cases in which a significant spawning run is observed (4 or 5 on the spawning scale) coincidental with and at the same location as the beach-impacting training event, the Navy will attempt to delay the event or move to a training area of lower density spawning or an area of no spawning. If such a shift cannot be done due to schedule conflict over multiple SSTC boat and beach lanes, logistic requirements to use a specific lane or area within a lane that precludes a shift, or safety considerations (ex., weather conditions, sea state), then the Navy will inform NMFS Southwest Region that training was conducted on that site for the specified reason.<br><br>• As a result of the NMFS IHA consultation, there will likely be annual SSTC-specific reporting requirements on the quantities (number of detonations) and types (charge weight) of individual explosive used. In addition, also as part of the IHA monitoring requirement, the Navy will be conducting representative mitigation monitoring for a sub-set of the total underwater detonations authorized by NMFS. This is approximately 4-16 individual detonation training events. During this monitoring, civilian marine biologists will independently observe the oceanside detonation site for marine mammals and sea turtles to ensure and document that the correct protective measures are applied. Under the EFH consultation, these biologists will also document the extent and quantity of any fish morality (or lack of mortality). This information will be included in the Navy's annual monitoring report to NMFS. | | |

**Table ES-2: Summary of Effects (Continued)**

| Resource | No Action Alternative | Alternative 1 | Alternative 2 |
|---|---|---|---|
| **3.9 Marine Mammals** | • Modeling estimates for the No Action Alternative indicate that exposures are not expected to result in injury, severe injury, or mortality of marine mammals. Without implementation of current mitigation measures, underwater detonations and pile driving could result in behavioral and temporary threshold shift (TTS) (Level B) harassment exposures. 78 annual exposures to pressure from underwater detonations could result in TTS and 68 annual exposures could result in nonphysiological behavioral exposures (Level B harassments). In addition, 30 annual exposures (20 bottlenose dolphins, 10 harbor seals) from pile installation activities and 144 annual exposures (3 gray whales, 84 bottlenose dolphins, 51 California sea lions, and 6 harbor seals) pile removal activities could result in Level B harassment. No exposures are expected to result in injury, severe injury, or mortality.<br>• Implementation of current mitigation measures minimizes potential impacts to marine mammal species in the SSTC ROI.<br>• Ship collisions are unlikely due to the low density of marine mammals in the area. | • Modeling estimates for Alternative 1 indicate that without implementation of current mitigation measures, an increased tempo of underwater detonations and pile driving could result in an increase of behavioral and TTS (Level B) harassment. 153 annual exposures to pressure from underwater detonations could result in TTS and 114 annual exposures could result in nonphysiological behavioral exposures (Level B harassments). In addition, 60 annual exposures (40 bottlenose dolphins, 20 harbor seals) from pile installation activities and 288 annual exposures (6 gray whales, 168 bottlenose dolphins, 102 California sea lions, and 12 harbor seals) pile removal activities could result in Level B harassment. No exposures are expected to result in injury, severe injury, or mortality.<br>• Implementation of current mitigation measures would minimize potential impacts to marine mammal species in the SSTC ROI.<br>• Ship collisions are unlikely due to the low density of marine mammals in the area.<br>• Effects from other activities are the same as described under the No Action Alternative. | • With implementation of current mitigation measures, effects are the same as described under Alternative 1. |

**Table ES-2: Summary of Effects (Continued)**

| Resource | No Action Alternative | Alternative 1 | Alternative 2 |
|---|---|---|---|
| **3.9 Marine Mammals (Continued)** | **Mitigation:**<br>For very shallow water (VSW) underwater detonations on SSTC oceanside (0-24 feet):<br>• Easily visible anchored floats will be positioned on a 1,200 foot or 400 yard radius of a roughly semi-circular zone (the shoreward half being bounded by shoreline and immediate off-shore water) around the detonation location for small explosive exercises at the SSTC. These mark the outer limits of the mitigation zone.<br>• For each VSW underwater detonation event, a safety-boat with a minimum of one observer is launched 30 or more minutes prior to detonation and moves through the area around the detonation site. The task of the safety observer is to exclude humans from coming into the area and to augment a shore observer's visual search of the mitigation zone for marine mammals. The safety-boat observer is in constant radio communication with the exercise coordinator and shore observer discussed below.<br>• A shore-based observer will also be deployed for VSW detonations in addition to boat based observers. The shore observer will indicate that the area is clear of marine mammals after 10 or more minutes of continuous observation with no marine mammals having been seen in the mitigation zone (1,200 feet or 400 yards) or moving toward it.<br>• At least 10 minutes prior to the planned initiation of the detonation event-sequence, the shore observer, on an elevated on-shore position, begins a continuous visual search with binoculars of the mitigation zone. At this time, the safety-boat observer informs the shore observer if any marine mammal has been seen in the zone and, together, both search the surface within and beyond the mitigation zone for marine mammals (and other protected species such as sea turtles).<br>• The observers (boat and shore based) will indicate that the area is not clear any time a marine mammal is sighted in the mitigation zone or moving toward it and, subsequently, indicate that the area is clear of marine mammals when the animal is out and moving away and no other marine mammals have been sited.<br>• Initiation of the detonation sequence will only began on final receipt of an indication from the shore observer that the area is clear of marine mammals and will be postponed on receipt of an indication from that any observer that the area is not clear of marine mammals.<br>• Following the detonation, visual monitoring of the mitigation zone continues for 30 minutes for the appearance of any marine mammal in the zone. Any marine mammal appearing in the area will be observed for signs of possible injury.<br>• Any marine mammal observed after a VSW underwater detonation either injured or exhibiting signs of distress will be reported to Navy environmental representatives from the regional Navy shore commander (Commander, Navy Region Southwest) and U.S. Pacific Fleet, Environmental Office, San Diego Detachment. The Navy will report these events to the Stranding Coordinator of NMFS' Southwest Regional Office using Marine Mammal Stranding communication trees and contact procedures established for the Southern California Range Complex. These voice or email reports will contain the date and time of the sighting, location (or if precise latitude and longitude is not currently available, then the approximate location in reference to an established SSTC beach feature), species description (if known), and indication of the animal's status. | | |

**Table ES-2: Summary of Effects (Continued)**

| Resource | No Action Alternative | Alternative 1 | Alternative 2 |
|---|---|---|---|
| **3.9 Marine Mammals (Continued)** | Mitigation measures for shallow water underwater detonations on SSTC oceanside (24-72 feet):<br>• A mitigation zone of 1,500 feet or 500 yards will be established around each underwater detonation point. This mitigation zone is based on the maximum range to onset-TTS (either 23 psi or 182 dB)<br>• A minimum of two boats, including but not limited to small zodiacs and 11-meter Rigid Hulled Inflatable Boats (RHIB) will be deployed. One boat will act as an observer platform, while the other boat is typically the diver support boat.<br>• Two observers with binoculars on one small craft/boat will survey the detonation area and the mitigation zone for marine mammals from at least 30 minutes prior to commencement of the scheduled explosive event and until at least 30 minutes after detonation.<br>• In addition to the dedicated observers, all divers and boat operators engaged in detonation events can potentially monitor the area immediately surrounding the point of detonation for marine mammals (and other protected species such as sea turtles).<br>• If a marine mammal is sighted within the 1,500 foot or 500 yard mitigation zone or moving towards it, underwater detonation events will be suspended until the marine mammal has voluntarily left the area and the area is clear of marine mammals for at least 30 minutes.<br>• Immediately following the detonation, visual monitoring for marine mammals within the mitigation zone will continue for 30 minutes. Any marine mammal observed after an underwater detonation either injured or exhibiting signs of distress will be reported to Navy environmental representatives from the regional Navy shore commander (Commander, Navy Region Southwest) and U.S. Pacific Fleet, Environmental Office, San Diego Detachment. The Navy will report these events to the Stranding Coordinator of NMFS' Southwest Regional Office using Marine Mammal Stranding communication trees and contact procedures established for the Southern California Range Complex. These voice or email reports will contain the date and time of the sighting, location (or if precise latitude and longitude is not currently available, then the approximate location in reference to an established SSTC beach feature), species description (if known), and indication of the animal's status.<br><br>Mitigation for ELCAS/Pile Driving Activities on SSTC oceanside:<br>• A mitigation zone will be established at 150 feet or 50 yards from ELCAS pile driving and pile removal events. This mitigation zone is base on the predicted range to Level A harassment (180 dB RMS) for cetaceans, and is being applied conservatively to both cetaceans and pinnipeds.<br>• Monitoring will be conducted within the 150 foot or 50 yard mitigation zone surrounding ELCAS pile driving and removal events for the presence of marine mammals (and other protected species such as sea turtles) before, during, and after pile driving and removal events.<br>• If marine mammals are found within the 150 foot or 50 yard mitigation zone, pile removal events will be halted until the marine mammals (or sea turtles) have voluntarily left the mitigation zone.<br>• Monitoring for marine mammals (or sea turtles) will take place concurrent with pile removal events and 30 minutes prior to pile driving and removal commencement. A minimum of one trained observer will be placed on shore, on the ELCAS, or in a boat at the best vantage point(s) practicable to monitor for marine mammals. | | |

**Table ES-2: Summary of Effects (Continued)**

| Resource | No Action Alternative | Alternative 1 | Alternative 2 |
|---|---|---|---|
| **3.9 Marine Mammals (Continued)** | • Monitoring observer(s) will implement shut–down/delay procedures when applicable by calling for shut–down to the hammer operator when marine mammals (or sea turtles) are sighted within the mitigation zone.<br>• Soft Start - Providing additional protection for marine mammals (and sea turtles), ELCAS pile driving includes a soft start as part of normal construction procedures. The pile driver increases impact strength as resistance goes up. At first, the pile driver piston drops a few inches. As resistance goes up, the pile driver piston will drop from a higher distance thus providing more impact due to gravity. This will allow marine mammals in the project area to vacate or begin vacating the area minimizing potential harassment. The ELCAS soft start is not the traditional soft-start used in bigger civilian construction projects, and doesn't include a waiting period (an initial set of several strikes from the impact hammer at 40-60 percent energy levels, followed by a one minute waiting period, then two subsequent 3 strike sets), but does provide additional time for marine mammals to vacate the area.<br><br>For underwater detonations on SSTC oceanside under Alternative 1 and 2:<br>• The buffer for very shallow water detonations (0 to 24 feet of water) and for shallow water detonations (in 24 to 72 feet of water) will be the same as described for the No Action Alternative.<br><br>For SWAG charges laid bayside on SSTC under Alternative 1 and 2:<br>• A buffer zone of 180 feet will be established around each SWAG detonation point.<br>• Observer(s) with binoculars and small craft will survey the detonation area and the buffer zone for marine mammals from at least 10 minutes prior to commencement of the scheduled explosive event until at least 10 minutes after detonation. Observers will pay extra attention within the buffer zone to large amounts of floating kelp strands and other marine debris (if any), since these may provide shelter and food for marine mammal prey.<br>• Divers placing charges on mines and dive support vessels will check the area immediately around the mine location for marine mammals.<br>• If a marine mammal is sighted within the buffer zone or moving towards it, exercises will be suspended until the animal has voluntarily left the area and the area is clear of sea turtles and marine mammals for at least 10 minutes.<br>• Immediately following the detonation, visual monitoring for marine mammals within the buffer zone will continue for 10 minutes. Any animals appearing will be observed for signs of injury. Injured marine mammals will be reported to the CNRSW Environmental Director, the PACFLT Environmental Office, and NMFS.<br><br>Mitigation for ELCAS/Pile Driving Activities on SSTC oceanside:<br>• The Navy proposes, under the associated SSTC marine mammal monitoring plan, to conduct underwater acoustic propagation monitoring during the first available ELCAS deployment at the SSTC under the Incidental Harassment Authorization application. This acoustic monitoring would provide empirical field data on ELCAS pile driving and removal underwater source levels, and propagation specific to ELCAS training at the SSTC. These results will be used to either confirm or refine the Navy's exposure predictions. | | |

**Table ES-2: Summary of Effects (Continued)**

| Resource | No Action Alternative | Alternative 1 | Alternative 2 |
|---|---|---|---|
| **3.10 Sea Turtles** | • Underwater detonations, vessel strikes, and noise associated with marine vessels and pile driving are unlikely to adversely impact sea turtles due to their rarity in the SSTC, the concentration of activities in ocean boat lanes, and implementation of mitigation measures.<br>• Training activities under the No Action Alternative may affect, but is not likely to adversely affect, ESA-listed turtles. | • Training tempo would increase; however, impacts are expected to be substantially the same as the No Action Alternative.<br>• Training activities under Alternative 1 may affect, but is not likely to adversely affect, ESA-listed turtles. | • Training tempo would increase; however, impacts are expected to be substantially the same as the No Action Alternative.<br>• Training activities under Alternative 1 may affect, but is not likely to adversely affect, ESA-listed turtles. |
| | **Mitigation:**<br>• Current mitigation measures for pre- and post- underwater detonation and ELCAS monitoring, including restriction of activities when sea turtles are within a buffer zone, will continue to be implemented as they are for marine mammals. Similar mitigation measures for underwater detonations would be implemented for SWAG and ELCAS under Alternatives 1 and 2.<br>As a result of the informal green sea turtle consultation with NMFS, the Navy will implement an additional mitigation measure:<br>• If there are sea turtles known to be equipped with sonic tags in the area of and during pile driving operations, Navy will collaborate with NMFS to analyze movements of these turtles in the immediate area during pile driving. Following any monitoring of sound attenuation associated with pile driving, the Navy will share the results with NMFS and provide recalculations of buffer zones as they are available. | | |

**Table ES-2: Summary of Effects (Continued)**

| Resource | No Action Alternative | Alternative 1 | Alternative 2 |
|---|---|---|---|
| **3.11 Terrestrial Biological Resources** | • Effects to San Diego Fairy Shrimp would be negligible. With access restrictions, management and conservation measures, training activities may affect, but are not likely to adversely affect, ESA-listed San Diego fairy shrimp.<br>• Potential impacts to federal and state protected plants and invertebrates and CNPS special status plants from air and marine vessel activities are expected to be minimal, as activities occur in the air and below the high tide line. Foot and vehicle traffic may have the greatest effect on terrestrial biological resources; though effects are expected to be temporary and cease at the termination of an activity.<br>• Effects on wildlife would be limited to temporary disturbance under this alternative. | • Foot traffic in vernal pool areas could adversely impact individual fairy shrimp. However, impacts would be minimized, due to the low levels of foot traffic that would occur in the pools, exclusion of certain pools from any access at any time to training, and the limitation of activities in training-accessible to when those vernal pools are dry. Potential impacts to the San Diego fairy shrimp are also associated with emergency vehicle use in emergency situations in the vernal pool area. With access restrictions, management and conservation measures, training activities may affect, but are not likely to adversely affect, San Diego fairy shrimp. The USFWS signed a Biological Opinion (signed July 7, 2010) concluding that the Proposed Action would not jeopardize the continued existence of the San Diego fairy shrimp.<br>• Potential increased training on SSTC-N beach lanes Blue 2, Orange 1 and Orange 2 could increase impacts to special status plants and invertebrates in these areas while decreasing impacts at other locations. Some trampling of vegetation at these locations is expected, though the overall effect on non-avian biological resources is expected to be short term and of moderate intensity due to the potential overlap of concentrated activities in the dunes and upper beach areas. These activities do not pose long-term impacts, effects are expected to be temporary and cease at the termination of an activity. Increased foot traffic could cause behavioral impacts to surrounding wildlife, though this effect is expected to be temporary.<br>• Various activities have the potential to impact Brand's phacelia within the Bravo training area. | • Effects of Alternative 2 would be different from those under Alternative 1 because of the increased access to SSTC-N oceanside training lanes. Activity levels would not increase, so effects from those activities which access the SSTC-N lanes would be spread more widely across the ROI. Plants and animals in the unrestricted training lanes could be more affected due to the increase in frequency of use, whereas plants and animals in other lanes could be less affected due to reduced usage. |

**Table ES-2: Summary of Effects (Continued)**

<table>
<tr><th>Resource</th><th>No Action Alternative</th><th>Alternative 1</th><th>Alternative 2</th></tr>
<tr><td>3.11 Terrestrial Biological Resources<br>(Continued)</td><td colspan="3">Mitigation:<br>• Under the No Action Alternative and Alternative 1, Vehicle Patrolling and LARC V Operator Training are limited to training lanes Yellow 1 and 2 and Green 1 and 2, and will not occur in Red, Blue, or Orange Beach Lanes.<br>• For the San Diego fairy shrimp, under the Proposed Action, the Navy will avoid vernal pools occupied by San Diego fairy shrimp and their watersheds when designating parachute drop zones in SSTC-S Inland. Vernal pools will be identified to assure that drop zones are located at least 30 m (100 ft) from each occupied pool. The Navy will restrict parachutists to the southern portion of the established Kaufman drop zone.<br>• The Navy will consider the location of vernal pools occupied by San Diego fairy shrimp and their watersheds when planning training involving off-road foot traffic at SSTC-S Inland. To the maximum extent consistent with training need, off-road foot traffic will avoid the occupied vernal pools and their watersheds. The Navy will avoid the occupied vernal pools and their watersheds adjacent to the road at SSTC-S Inland (i.e., pools 1 through 7 marked with flexi-stakes) year round to the maximum extent consistent with training need. Avoidance may be accomplished using markers, maps, GPS coordinates or any other means consistent with training needs. Training would not be allowed in the remaining vernal pools when conditions are wet. Foot traffic would be permitted in the pools when conditions are dry.<br>• The Navy will be completing and submitting a Vernal Pool Management and Monitoring Plan to the USFWS and the California Coastal Commission in order to help identify whether the impacts identified in this EIS remain at the low levels expected. The Plan will include focused invasive plant survey in the pools and their watersheds; plant, topographic, hydrological, and water quality surveys (including salinity); and protocol fairy shrimp surveys. The Vernal Pool Management and Monitoring Plan will list: 1) what criteria are used to determine that the pools are dry, and 2) who makes the “dry” determination, i.e., the qualifications of the person responsible for determining wet and dry conditions. The Plan will identify measures to minimize the potential for adverse effects to fairy shrimp from weed abatement, pool restoration, or pool augmentation. The Navy will be establishing the baseline distribution and abundance of San Diego fairy shrimp and condition of the vernal pool habitat prior to initiating training activities in or around the vernal pools at SSTC-S Inland. The Navy will report monitoring results and any observed incidental take to the USFWS and California Coastal Commission annually, and will adjust management to the vernal pools occupied by San Diego fairy shrimp to minimize any training impacts detected by monitoring. If impacts are more than the low levels anticipated or impacts could lead to the extirpation of fairy shrimp from any individual pool, then the Navy will reinitiate consultation with the USFWS.<br>• Current natural resource protection measures would continue, such as those derived through Navy Instructions, ecosystem-based planning in the INRMPs, and the employment of best management practices and standard operating procedures to avoid and minimize environmental impacts. Existing measures include invasive species control, erosion control, inventory, monitoring, and habitat enhancement.</td></tr>
</table>

**Table ES-2: Summary of Effects (Continued)**

| Resource | No Action Alternative | Alternative 1 | Alternative 2 |
|---|---|---|---|
| **3.12 Birds** | • Current management practices restrict activities from occurring in some nesting areas during the breeding season, particularly three SSTC-N beach lanes Blue 2, Orange 1, and Orange 2 as well as Delta North and South.<br>• Potential impacts from air and marine vessel activities, as well as LCAC activities are expected to be minimal to nesting species, as activities occur or are scheduled for areas with no or minimal nesting.<br>• If there are birds found diving or circling around an underwater detonation point, activities will be halted until the birds have left the area, which minimizes the potential for blast impacts to diving birds.<br>• Habitat for nesting and foraging migratory land birds, as well as for shorebirds and seabirds may be degraded due to the presence of foot traffic and from land detonations and pyrotechnics. None of these temporary effects are expected to have an adverse effect on migratory birds at the population level.<br>• The majority of beach activities occur away from nests on the beach, below the high tide line. Activities occurring near the nesting area potentially affect nesting birds. However, current management practices minimize adverse effects. | • Alternative 1 would have additional effects on birds. The increased frequency and intensity of these activities would encourage birds to avoid the area.<br>• Vehicle patrolling and testing at SSTC-N would minimally impact nesting migratory birds or shorebird foraging under this Alternative, because these activities would be restricted to specific training lanes.<br>• Habitat for nesting and foraging migratory land birds, as well as for shorebirds and seabirds may be degraded due to the presence of foot traffic, and noise from pyrotechnics. While impacts to nesting habitats would increase under this Alternative, existing infrastructure, training requirements, scheduling needs, and mitigation measures will naturally pull activities away from these habitat areas, minimizing impacts. None of the temporary effects from training are expected to have an adverse effect on migratory birds at the population level.<br>• Losses in California least terns and western snowy plover nesting is expected to be minimally increased from current, No Action Alternative levels. Current and proposed mitigation measures well compensate for these losses.<br>• The Navy has consulted with the USFWS under Section 7 of ESA. The USFWS concluded that the proposed action is not likely to jeopardize the continued existence of ESA-listed species (signed Biological Opinion, July 7, 2010). | • Effects are the same as described for the No Action Alternative for air and marine vessel activities as well as LCAC and ELCAS activities. Effects of other activities are the same as Alternative 1.<br>• Under Alternative 2, training has the option of going into Lanes 8, 9, and 10 and impact nesting birds there. Migratory birds that coincidently use this area would also be impacted. Military activities will not often go into these training lanes, however, due to the infrastructure, training requirements, scheduling needs, and mitigation measures causing activities to naturally gravitate away from nesting areas.<br>• Losses in California least terns nesting is expected to increase, and losses to western snowy plover nesting is expected to be minimally increased from current, No Action Alternative levels. Current and proposed mitigation measures well compensate for these losses. |

**Table ES-2: Summary of Effects (Continued)**

| Resource | No Action Alternative | Alternative 1 | Alternative 2 |
|---|---|---|---|
| **3.12 Birds (continued)** | • Loss in California least tern nesting historically has been and is expected to continue to be small when compared to overall nesting levels. Current mitigation measures well compensate for these losses. | | |
| | **Mitigation:**<br>• Current mitigation measures include: communication and coordination of training area protocols, nest relocation, predator management and control, habitat modification, site preparation, nest substrate enhancement, signage and education, recreational use restriction, rearing of collected eggs, injured, and sick individuals, a western snowy plover health study, and monitoring.<br>• Under Alternative 1, vehicle patrolling and LARC V Operator Training would not occur in Red, Blue or Orange Beach Lanes. Observation for birds will be conducted prior to and after underwater detonations and detonation activities would be delayed if flocks of diving birds are present. Mitigation measures are described in detail in Sections 3.12.4, 3.12.3.2.1, 3.12.3.2.2 and 3.12.3.2.3.<br>• Develop and implement a Long-term Site Enhancement Plan that includes invasive vegetation control on SSTC oceanside beach lanes, establishing dunes on the windward (west) edges of Delta North and South that would enhance this area for plovers, create a source of sand for the least tern nesting area, and establish a better visual barrier between SR-75 and the nesting colony.<br>• Install temporary barriers and improved signage on the southern end of SSTC-N to more clearly notify the public of the Navy's exclusive use of SSTC-N beach and existing restrictions on public usage of those beaches.<br>• The Navy will consider the tide conditions when developing training schedules, and schedule training activities that could be conducted on the hardpack during low tides when consistent with training needs.<br>• The Navy will mark and buffer up to 22 concurrent snowy plover nests established at SSTC-N and SSTC-S beaches plus any additional nests that exceed 22 that are initiated in beach lanes Orange 1 and Orange 2.<br>• Under baseline conditions, the southern 3 beach lanes are marked to facilitate avoidance of tern and plover nests. The Navy is developing a marking strategy to delineate least tern and snowy plover nesting areas that does not encumber training activities. Such a marking strategy may entail signage affixed to existing beach lane sign posts and a limited number of additional markers.<br>• The Navy will delineate the boundary of SSTC-S that parallels the mean high tide line in a manner that does not encumber training exercises. | | |

**Table ES-2: Summary of Effects (Continued)**

| Resource | No Action Alternative | Alternative 1 | Alternative 2 |
|---|---|---|---|
| **3.12 Birds (Continued)** | **Mitigation (Continued):**<br>• If relocation of any least tern or snowy plover nest/egg is necessary as a protective measure, each nest/egg will be relocated the shortest distance possible into suitable habitat by Service-approved monitors to increase the chances for nest success. The weekly reports to be submitted to the CFWO under the proposed project will include: a) date the nests/eggs were moved, b) number of nests/eggs moved, c) original and ending location of nests/eggs moved, and (d) distance the nests/eggs were moved.<br>• The NBC Natural Resources staff will brief all dog handlers annually, or more frequently if necessary, of guidelines pertaining to the use of military working dogs on SSTC beaches. Military working dog handlers will be notified weekly of the locations of plover nests and, to the maximum extent possible, remain a minimum of 30 m (90 ft) from markers that delineate the locations of nesting plovers. Outside of the nesting season (15 Sept through end of February), training may occur unencumbered.<br>• Physical conditioning will primarily occur on the hard pack sand on SSTC oceanside beaches. If physical conditioning on soft pack sand is necessary, handlers and military working dogs will run on the sand road (SSTC-N only) or within 20 feet of the hard pack sand (SSTC-S only) to reduce the disturbance and impact to nesting terns and plovers.<br>• At SSTC-N, military working dogs will exercise primarily between beach lanes Yellow 1 and Blue 1, where they may cross the beach to get to the sand road at the existing route immediately to the north of the demo pit. The Navy will not conduct physical conditioning using dogs in the southern three beach lanes until: a) completing a study to evaluate the effects of military working dogs on terns and plovers and b) coordinating with the USFWS to develop conservation measures to minimize any additional effects. The Navy will submit the study design and scope of work to the Service for review and approval. The Navy will allow the Service 30 days to submit comments and an additional 30 days to approve the final study design and scope of work.<br>• If military working dog training is requested as part of Platoon Over-the-Beach activities at SSTC-N, these activities will be scheduled in beach lanes Yellow 1, the north half of Yellow 2, Green 1 or Green 2, pending the results of the Navy's study to evaluate the response of terns and plovers to military working dog presence.<br>• The Navy will coordinate with the Service in the development of the Long Term Habitat Enhancement Plan for SSTC and will submit the plan to the Service for review and approval. . The Navy will allow the Service 30 days to submit comments and an additional 30 days to approve the final study design and scope of work.<br>• The Navy will include the following information in the yearly reports to be submitted to the USFWS under the proposed project: a) the number and distribution of terns and plovers observed in each training lane; b) the number of any dead or injured least terns or snowy plovers (including eggs, chicks or adults) observed in each training lane; c) the hatching rate of terns and plovers in each beach lane; d) maps of the locations of tern and plover roosts within the action area; e) the timing and number of training events within the southern 3 beach lanes, and other beach lanes, to the extent available; f) the date and condition of any dead or injured tern or plover; and g) any measures taken to prevent additional tern or plover death or injury.<br>• The Navy will ensure that biological monitors look for and document the location of least tern or snowy plover nests, eggs and chicks prior to and after all military training exercises, to allow assessment of take associated with training activities. | | |

**Table ES-2: Summary of Effects (Continued)**

| Resource | No Action Alternative | Alternative 1 | Alternative 2 |
|---|---|---|---|
| **3.12 Birds (Continued)** | **Mitigation (Continued):**<br>• The Navy will provide California Coastal Commission staff monitoring reports prepared for the U.S. Fish and Wildlife Service under the July 7, 2010 Biological Opinion .<br>• Consistent with other applicable laws and to the extent possible and practical, the Navy will maintain signs and enforce the existing ban on the public bringing nonmilitary working dogs to Navy-controlled beaches. | | |
| **3.13 Cultural Resources** | • Vehicular activities and other ground disturbing activities are excluded from cultural resource sites and their immediate surrounding areas. Foot traffic does not constitute an adverse effect.<br>• Training activities may occur in areas with known submerged cultural resources; however, resources are avoided as necessary to prevent damage. | • Vehicular activities and other ground disturbing activities are excluded from cultural resource sites and their immediate surrounding areas. Foot traffic does not constitute an adverse effect.<br>• Training activities may occur in areas with known submerged cultural resources; however, resources would be avoided as necessary to prevent damage. | • The effects of Alternative 2 on cultural resources would be to the same as those described under Alternative 1. |
| | **Mitigation:**<br>The Navy currently employs the following management practices to avoid impacts to cultural resources: restricts digging near any cultural resource site that is known to be eligible for listing in the National Register of Historic Places (NRHP), limits of operational training access on or across the recorded areas of eligible or potentially eligible archaeological sites to foot traffic only, and no alteration or damage to the appearance, structure, or features of NRHP-eligible built properties is permitted without appropriate Section 106 review and compliance. | | |

**Table ES-2: Summary of Effects (Continued)**

| Resource | No Action Alternative | Alternative 1 | Alternative 2 |
|---|---|---|---|
| **3.14 Transportation and Circulation** | • Intersections and roadways within the ROI experience an acceptable Level of Service (LOS). Although the intersections at Gates 1 and 2 experience unacceptable LOS, traffic related to the No Action Alternative represents less than 1% of the volume at these intersections.<br>• Marine traffic is diverted from training areas while some training is being conducted; however, vessels are not prevented from getting to their desired locations. | • Increases in military training vehicle trips per day would represent less than 2% of the total daily traffic and would be well within the capacities of the existing regional roadway network.<br>• Intersections and roadways within the ROI experience an acceptable LOS. Although the intersections at Gates 1 and 2 experience unacceptable LOS, traffic related to Alternative 1 represents less than 1% of the morning volume and less than 2% of the evening traffic at these intersections.<br>• Marine traffic is diverted from training areas while some training is being conducted; however, vessels are not prevented from getting to their desired locations. | • Potential effects on transportation and circulation from Alternative 2 would be the same as effects from implementation of Alternative 1. |
| | **Mitigation:**<br>The Navy strives to ensure that it retains access to oceanside and bayside training areas as necessary to accomplish its mission, while facilitating joint military-civilian use of such areas to the extent practicable and consistent with safety. These goals of military access, joint use, and safety are promoted through various coordination and outreach measures, including publication of potentially hazardous activities planned for the oceanside and bayside areas through Notices to Mariners issued by the U.S. Coast Guard. | | |

**Table ES-2: Summary of Effects (Continued)**

<table>
<tr><th>Resource</th><th>No Action Alternative</th><th>Alternative 1</th><th>Alternative 2</th></tr>
<tr><td rowspan="2">3.15 Socioeconomics, Environmental Justice, and Protection of Children</td><td>• Navy presence currently has a beneficial socioeconomic impact on the region.<br>• EO 12898 – There are no disproportionately high and adverse human health or environmental effects of the No Action Alternative on minority populations and low-income population or Indian tribes.<br>• EO 13045 – Under the No Action Alternative no disproportionate environmental health and safety risks specific to children are expected.</td><td>• Socioeconomics - Existing regional population and associated housing impacts, employment rates, and regional economy would remain unchanged.<br>• EO 12898 – There would be no disproportionately high and adverse human health or environmental effects of Alternative 1 on minority populations and low-income populations or Indian tribes.<br>• EO 13045 – Under Alternative 1 no disproportionate environmental health and safety risks specific to children are expected.</td><td>• Impacts are expected to be the same as Alternative 1.</td></tr>
<tr><td colspan="3">Mitigation: Mitigation measures proposed for other resources (e.g., Water Resources [Section 3.5], Acoustic Environment [Section 3.6], and Public Health and Safety [Section 3.16]) would serve to further minimize effects related to environmental justice and protection of children.</td></tr>
</table>

**Table ES-2: Summary of Effects (Continued)**

| Resource | No Action Alternative | Alternative 1 | Alternative 2 |
|---|---|---|---|
| **3.16 Public Health and Safety** | • Routine training activities conducted within SSTC pose little risk to public health or safety outside of the training areas.<br>• Risks to the public from rotary-wing aircraft supporting SSTC training is minimal, based on past safety record, low number of flights, and over-water flight paths.<br>• Risks to the public from marine vessels supporting SSTC training and small craft participating in training are minimal based on past safety record and established right-of-way conventions and avoidance procedures. | • On-site training activities would increase. The Navy would continue to implement Range Control Coordination Procedures to avoid public safety issues. Unauthorized access may decrease because more frequent and visible use of beach training areas by military units could discourage the public from entering beach training areas.<br>• Air support and marine vessel support would increase, but for the reasons noted under the No Action Alternative, public safety would be maintained. | • Impacts would be similar to those under Alternative 1. Increased training and more visible use of Blue 2, Orange 1, and Orange 2 may further discourage unauthorized access. |
| | **Mitigation:** Mitigation measures for other resources that affect public health and safety (e.g. noise, hazardous materials and waste, water resources) would be implemented. Current measures in place to ensure that nonparticipants are not endangered by Navy actions would continue: buffers for underwater detonations, existing guards and/or gates around many training areas, and monitoring for non-participants during training. | | |

## ES 1.14 OTHER REQUIRED CONSIDERATIONS

### ES 1.14.1 Possible Conflicts with Objectives of Federal, State, and Local Plans, Policies, and Controls

Implementation of the Navy's alternatives, including the Proposed Action for the SSTC EIS, would not conflict with the objectives or requirements of federal, state, regional, or local plans, policies, or legal requirements. The Navy has consulted with regulatory agencies as appropriate during the NEPA process and prior to implementation of the Proposed Action to ensure requirements are met. A full description is provided in Chapter 6 but is summarized for consultations in the following table. Appendix G provides a list of the Silver Strand Training Complex (SSTC) regulatory agency consultation documentation. Agency correspondence and supporting documentation can be found on the SSTC EIS website at www.silverstrandtrainingcomplexeis.com.

**Table ES-3: Summary of Environmental Compliance for the Proposed Action**

| Plans, Policies, and Controls | Responsible Agency | Status of Compliance |
|---|---|---|
| Coastal Zone Management Act (CZMA) (16 C.F.R. §§ 1451 *et seq*.) | California Coastal Commission (CCC) | A Coastal Consistency Determination (CCD) was prepared in compliance with the CZMA, which states that Federal actions that have reasonably foreseeable effects on coastal uses or resources must be consistent to the maximum extent practicable with the enforceable policies of approved state coastal management programs. Applicable sections of the California Coastal Act of 1976 (14 California Code of Regulations § 13001 *et seq*.) were thoroughly analyzed against the Proposed Action.<br>• The Navy submitted the CCD to the CCC on May 26, 2010.<br>• Coastal Consistency Determination conditional concurrence received on August 17, 2010.<br>• The Navy submitted a conditional concurrence response letter to the California Coastal Commission on August 20, 2010.<br>• Final Consistency Determination Notification letter to California Coastal Commission dated November 23, 2010. The Navy determined that the conditions of concurrence proposed by the California Coastal Commission are not necessary for the proposed activities to be consistent to the maximum extent practicable with the applicable enforceable policies of the California Coastal Management Program (CCMP) as the Navy's proposed activities are consistent to the maximum extent practicable with the CCMP. |
| Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. §§ 1801-1802) | National Oceanic and Atmospheric Administration (NOAA) - National Marine Fisheries Service (NMFS) | Implementation of the Proposed Action would result in a direct effect on eelgrass. However, based upon the minimal short-term impacts associated with the Proposed Action and extensive mitigation through eelgrass planting, there will not be any adverse effects to Essential Fish Habitat (EFH). The Navy submitted an EFH assessment to NMFS that reviews the impacts of the Proposed Action on EFH that includes applicable mitigation measures. The Navy has completed consultation NMFS and has received concurrence that with implementation of mitigation measures, there will not be any adverse effects to Essential Fish Habitat (EFH). |

**Table ES-3: Summary of Environmental Compliance for the Proposed Action (Continued)**

| Plans, Policies, and Controls | Responsible Agency | Status of Compliance |
|---|---|---|
| Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. §§ 1801-1802)<br>(Continued) | National Oceanic and Atmospheric Administration (NOAA) - National Marine Fisheries Service (NMFS) | • The Navy submitted an EFH assessment to NMFS on March 22, 2010.<br>• EFH updated to reflect discussions during the consultation process. A revised EFHA was submitted (September 27, 2010) to NMFS with inclusion of measures in the proposed action to include updated benthic habitat mapping, pre-event beach survey, eelgrass mitigation, and underwater detonation reporting.<br>• Consultation with NMFS was completed on (November 10, 2010) with the Navy's submission of its response letter to NMFS. |
| Endangered Species Act (ESA) (16 U.S.C. §§ 1531 et seq.) | U.S. Navy, U.S. Fish and Wildlife Service (USFWS) | The EIS analyzes potential effects to species listed under the ESA. In accordance with ESA requirements, the Navy has completed consultation under Section 7 of the ESA with USFWS and which indicates that the Proposed Action may affect, not likely to adversely affect, ESA-listed species. With regard to USFWS jurisdiction over species present in SSTC, the Navy has conducted its activities in accordance with any applicable Biological Opinions.<br>• The Navy initiated consultation with USFWS on September 22, 2008.<br>• Between November 18, 2008 and April 27, 2009, the Navy and USFWS met regularly to discuss the Proposed Action, effects to species and associated incidental take, and conservation measures to avoid, minimize, and monitor impacts.<br>• USFWS provided a draft Biological Opinion to the Navy for review and comment on August 28, 2009. The Navy provided preliminary comments on the draft biological opinion on September 28, 2009. The Navy and USFWS discussed the Navy's comments at meetings held on September 21 and September 29, 2008. USFWS addressed these comments and provided a revised draft biological opinion to the Navy on January 15, 2010. The Navy provided additional comments on the revised draft Biological Opinion to USFWS, via electronic mail, on March 3, 2010. The Navy and USFWS discussed the Navy's additional comments at meetings held on March 4 and May 26, 2010. The USFWS addressed the Navy's comments in the final Biological Opinion.<br>USFWS Biological Opinion signed on July 7, 2010 (FWS-SDG-08B0503-09F0517). |
| Endangered Species Act (ESA) (16 U.S.C. §§ 1531 et seq.) | U.S. Navy and NMFS | The Navy has also conducted informal consultation with NMFS for the green sea turtle. In accordance with ESA requirements, the Navy has completed informal consultation under Section 7 of the ESA with NMFS. NMFS has concurred that that the Proposed Action may affect, but is not likely to adversely affect, ESA-listed species.<br>• The Navy initiated informal consultation with NMFS for potential impacts to green sea turtles on March 15, 2010. |

**Table ES-3: Summary of Environmental Compliance for the Proposed Action (Continued)**

| Plans, Policies, and Controls | Responsible Agency | Status of Compliance |
|---|---|---|
| Endangered Species Act (ESA) (16 U.S.C. §§ 1531 et seq.) (Continued) | U.S. Navy and NMFS | • The Navy coordinated two exchanges of comments and responses with NMFS.<br>• NMFS informal consultation on green sea turtles completed with letter of concurrence on (November 17, 2010). |
| Marine Mammal Protection Act (16 U.S.C. §§ 1431 *et seq.*) | NOAA-NMFS | The Navy has submitted an application for an IHA to NMFS per the requirements of MMPA for proposed training activities that have the potential to incidentally take marine mammals.<br>• Received comments from NMFS on the IHA request on September 9, 2010.<br>• The Navy submitted the Final IHA to NMFS on September 15, 2010.<br>• Notice of Receipt of the IHA request published in the Federal Register on (October 19, 2010).<br>• After consideration of public comments on the IHA application, NMFS may grant the authorization to take small numbers of marine mammals by harassment if it finds that the taking will have a negligible impact on the species or stock(s) on subsistence uses (where relevant). NMFS will identify appropriate mitigation, monitoring and reporting requirements. |

### ES 1.14.2 Relationship between Short-term Uses and Long-term Productivity

The majority of activities addressed in the EIS would be categorized as long-term. For example, although the use of training areas for individual training activities (e.g., breacher) may be of short duration, the training areas would continue to receive increased and repeated use for the foreseeable future. As the Proposed Action includes an increase in training tempo, areas designated for training would accommodate a higher level of operational uses in the long-term which would, in turn, affect the long-term productivity of environmental resources in those areas. The Navy's proposal to increase access and availability of SSTC-N and SSTC-S oceanside beach training lanes and SSTC-S inland areas for military training is an example of the balancing of long-term productivity of the environment with the need to address range capability shortfalls. Addressing such shortfalls through planning and accommodation of future training tempo requirements and deployment schedules will allow the Navy to more readily facilitate long-term resource management strategies while achieving the near-term goal of providing the capacity and capabilities to fully support required training tasks and meet the Title 10 mandate.

### ES 1.14.3 Irreversible or Irretrievable Commitment of Resources

Increased training activities at the SSTC would result in the irretrievable commitment of nonrenewable energy resources, primarily in the form of fossil fuels (including fuel oil), natural gas, and gasoline construction equipment. Implementation of the Proposed Action would require fuels used by aircraft, vessels, and ground-based vehicles. Since fixed- and rotary-wing flight, amphibious vessels, and small craft activities could increase, total fuel use would increase. Fuel use by ground-based vehicles involved in training activities would also increase. Therefore, total fuel consumption would increase and this nonrenewable resource would be considered irreversibly lost.

### ES 1.14.4 Energy Requirements and Conservation Potential

Increased training activities on SSTC would result in an increase in energy demand over the No Action Alternative. Although the required electricity demands would be met by the existing electrical infrastructure at SSTC, energy requirements would be subject to any established energy conservation practices. The use of energy sources would be minimized wherever possible without compromising safety, training, or testing operations.

### ES 1.14.5 Natural or Depletable Resource Requirements and Conservation Potential

Resources that will be permanently and continually consumed by project implementation include water, electricity, natural gas, and fossil fuels. To the extent practicable, pollution prevention considerations are included. In addition, sustainable range management practices are in place that protect and conserve natural and cultural resources while preserving of access to training areas for current and future training requirements.

# Acronyms and Abbreviations

| | |
|---|---|
| AAAV | Advanced Amphibious Assault Vehicle |
| AAV | Amphibious Assault Vehicle |
| AB | Assembly Bill |
| ABLTS | Amphibious Bulk Liquid Transfer System |
| ACS | American Community Survey |
| ADT | average daily trips |
| AESO | Aircraft Environmental Support Office |
| AGL | Above Ground Level |
| AICUZ | Air Installation Compatible Use Zone |
| AMNS | Airborne Mine Neutralization System |
| AOU | American Ornithologists Union |
| APCD | Air Pollution Control District |
| APE | Area of Potential Effect |
| APHIS | Animal and Plant Health Inspection Service |
| APZ | Accidental Potential Zone |
| ARD | Audible Recall Device |
| ARPA | Archaeological Resources Protection Act |
| ASBS | Areas of Special Biological Significance |
| ASDS | Advanced SEAL Delivery System |
| AUV | Autonomous Underwater Vehicle |
| BA | Biological Assessment |
| BASH | Bird/Animal Aircraft Strike Hazard |
| BCC | Birds of Conservation Concern |
| BEPA | Bald Eagle Protection Act |
| BIU | Beach Interface Unit |
| BMP | Best Management Practice |
| BO | Biological Opinion |
| BP | before present |
| BSSC | Bird Species of Special Concern |
| BTU | Beach Termination Unit |
| BUD/S | Basic Underwater Demolition/SEAL |
| C | Candidate |
| C-4 | Composition 4 |
| CAA | Clean Air Act |
| CAAA | Clean Air Act Amendments |
| CAAQS | California Ambient Air Quality Standards |
| CalCOFI | California Cooperative Oceanic Fisheries Investigations |
| Cal-EPA | California Environmental Protection Agency |
| Caltrans | California Department of Transportation |
| CARB | California Air Resources Board |
| CASHPO | California State Historic Preservation Office |
| CCA | California Coastal Act |
| CCC | California Coastal Commission |
| CCD | Coastal Consistency Determination |
| CCP | Comprehensive Conservation Plan |
| CCR | California Code of Regulations |
| CDFG | California Department of Fish and Game |
| CDNL | C-weighted Day Night Level |
| CDPR | California Department of Parks and Recreation |
| CDMG | California Department of Mines and Geology |
| CE | State Endangered |
| CERCLA | Comprehensive Environmental Response, Compensation and Liability Act |
| CEQ | Council on Environmental Quality |
| CFP | CDFG Fully Protected |
| CFR | Code of Federal Regulations |
| CGS | California Geological Survey |
| CHPMM | Center for Health Promotion and Preventative Medicine |
| CISS | cast-in-steel-shell |
| CLZ | Craft Landing Zone |
| CMP | Coastal Management Plan |
| CNEL | Community Noise Equivalent Level |
| CNO | Chief of Naval Operations |
| CNPS | California Native Plant Society |
| CNRSW | Commander Navy Region Southwest |
| CO | Carbon Monoxide |
| $CO_2$ | Carbon Dioxide |
| COMNAVSPECWARCOM | Commander, Naval Special Warfare Command |
| COMNAVSURFPAC | Commander, Naval Surface Force, U.S. Pacific Fleet |
| COMPACFLT | Commander, U.S. Pacific Fleet |
| CPS | Coastal Pelagic Species |
| CQC | Close Quarters Combat |
| CQD | Close Quarters Defense |
| Cr | Coastal Beaches (soil type) |
| CRE | Comprehensive Range Evaluation |
| CRMP | Coordinated Resource Management & Planning Council |
| CRRC | Combat Rubber Raiding Craft |
| CSC | California Special Concern |
| CT | California Threatened |
| CUPA | Certified Unified Program Agency |
| CV | Coefficient of Variation |
| CVN | Nuclear Powered Aircraft Carrier |
| CWA | Clean Water Act |
| CZMA | Coastal Zone Management Act |
| DA | Direct Action Operations |
| dB | decibel |
| dBA | A-weighted decibel |
| dBC | C-weighted decibel |
| dBP | peak decibel |
| DDT | dichlorodiphenyltricholoroethane |
| DO | Dissolved Oxygen |
| DoD | Department of Defense |
| DoN | Department of the Navy |
| DNL | Day-Night Noise Level |
| DTSC | Department of Toxic Substances Control |
| DWT | dead weight tons |
| DZ | Drop Zone |
| EA | Environmental Assessment |
| EFD | Energy Flux Density |
| EFH | Essential Fish Habitat |
| EFV | Expeditionary Fighting Vehicle |
| EIS | Environmental Impact Statement |
| ELCAS | Elevated Causeway System |
| EMFAC | Emission Factors |
| EMR | Electromagnetic Radiation |
| EO | Executive Order |
| EOD | Explosive Ordnance Disposal |
| EODGRU | Explosive Ordnance Disposal Group |
| EPA | Environmental Protection Agency |
| EPCRA | Emergency Planning and Community Right-to-Know Act |
| ESA | Endangered Species Act |

| | |
|---|---|
| ESQD | Explosive Safety Quantity Distance |
| EWTGPAC | Expeditionary Warfare Training Group Pacific |
| °F | degrees Fahrenheit |
| FC | Federal Candidate Species |
| FE | Federal Endangered |
| FEIS | Final Environmental Impact Statement |
| FFCA | Federal Facilities Compliance Act |
| FM | Frequency Modulated |
| FMP | Fishery Management Plan |
| FOD | foreign object debris |
| FRTP | Fleet Readiness Training Plan |
| FSC | Federal Species of Concern |
| FT | Federal Threatened |
| FTX | Field Training Exercise |
| g | gram(s) |
| GHG | Greenhouse Gas |
| GPS | Global Positioning System |
| ha | hectare(s) |
| HAP | Hazardous Air Pollutant |
| HAPC | Habitat Area of Particular Concern |
| HC | High Concern |
| Md | Made Lands (soil type) |
| HERF | Hazards of Electromagnetic Radiation to Fuel |
| HERO | Hazards of Electromagnetic Radiation to Ordnance |
| HERP | Hazards of Electromagnetic Radiation to Personnel |
| HI | Highly Imperiled |
| HMMWV | High Mobility Multipurpose Wheeled Vehicle |
| HMTA | Hazardous Materials Transportation Act |
| HMX | High Melting Explosive |
| HrC | Huerhuero Loam (soil type) |
| HRST | Helicopter Rope Suspension Training |
| HS | Hydrogen sulfide |
| HSC | Health and Safety Code |
| HuC | Huerhuero Urban (soil type) |
| HWMP | Hazardous Waste Management Plan |
| Hz | hertz |
| I MEF | First Marine Expeditionary Force |
| IAD | Immediate Action Drills |
| IBS | Inflatable Boat, Small |
| IED | Improvised Explosive Device |
| IHA | Incidental Harassment Authorization |
| INLS | Improved Navy Lighterage System |
| INRMP | Integrated Natural Resources Management Plan |
| IRP | Installation Restoration Program |
| ITE | Institute of Transportation Engineers |
| JLOTS | Joint Logistics Over-the-Shore |
| KCRC | Kumeyaay Cultural Repatriation Committee |
| kHz | kilohertz |
| kg | kilogram(s) |
| km | kilometer(s) |
| kph | kilometer(s) per hour |
| L | liter |
| LAMPS | Light Airborne Multipurpose System |
| LAR | Lung Automatic Rebreather |
| LARC V | Lighter, Amphibious, Resupply, Cargo-5 ton |
| LCAC | Landing Craft, Air Cushion |
| LCM | Landing Craft Mechanized |
| LCP | Local Coastal Plan |
| LCU | Landing Craft Utility |
| LD | Lethal Dose |
| $L_{dn}$ | Day-Night Noise Level |
| $L_{eq}$ | Equivalent Noise Level |
| LIDAR | Light Detection and Ranging |
| LOS | level of service |
| LUPZ | Land Use Planning Zones |
| LZ | Landing Zone |
| m | meter(s) |
| $m^2$ | square meter(s) |
| $m^3$ | cubic meter(s) |
| MAGTF | Marine Air Ground Task Force |
| MAT | Maintenance and Training |
| MATLAB | Matrix Laboratory |
| MBTA | Migratory Bird Treaty Act |
| MC | Munitions Constituent |
| MCAS | Marine Corps Air Station |
| MCB | Marine Corps Base |
| MCM | Mine Countermeasures |
| MCT | Marine Corps Task |
| MW | mini-enclosure |
| MEC | munitions and explosives of concern |
| MEF | Marine Expeditionary Force |
| mg | milligram |
| MHHW | Mean Higher High Water |
| MIC | Marina Loamy Coarse Sand (soil type) |
| MLLW | Mean Lower Low Water |
| MMC | Marine Mammal Commission |
| MMPA | Marine Mammal Protection Act |
| MMR | Military Munitions Rule |
| MMRP | Military Munitions Response Program |
| MMS | Marine Mammal Systems |
| MOU | Memorandum of Understanding |
| MPFUB | Maritime Prepositioned Force Utility Boat |
| mph | mile(s) per hour |
| MPS | Maritime Prepositioning Ship |
| MRA | Marine Resources Assessment |
| MRP | Munitions Response Program |
| msl | mean sea level |
| MSE | Multiple Successive Explosions |
| msec | millisecond |
| MWR | Morale, Welfare, and Recreation |
| μPa | micropascal |
| μg | microgram |
| μm | micron |
| MSCP | Multiple Species Conservation Plan |
| N | North |
| NAAQS | National Ambient Air Quality Standards |
| NAB | Naval Amphibious Base |
| NAGPRA | Native American Graves Protection & Repatriation Act |
| NASNI | Naval Air Station North Island |
| NAVFACSW | Naval Facilities Engineering Command Southwest |
| NAVOCEANO | Naval Oceanographic Office |
| Navy | U.S. Department of the Navy |
| NRWQC | National Recommended Water Quality Criteria |
| NBC | Naval Base Coronado |
| NBG | Naval Beach Group |
| NBPL | Naval Base Point Loma |
| NCA | National Command Authority |
| NCW | Naval Coastal Warfare |
| NDAA | National Defense Authorization Act |
| NDDB | Natural Diversity Database |
| NE | Not Eligible |

| | |
|---|---|
| NECC | Navy Expeditionary Combat Command |
| NEMS | Navy Eelgrass Mitigation Sites |
| NEPA | National Environmental Policy Act |
| NEW | Net Explosive Weight |
| NHPA | National Historic Preservation Act |
| nm | nautical mile(s) |
| NMFS | National Marine Fisheries Service |
| $NO_2$ | Nitrogen Dioxide |
| NOAA | National Oceanic and Atmospheric Administration |
| NOI | Notice of Intent |
| NOLF | Naval Outlying Landing Field |
| NOTMAR | Notice to Mariners |
| $NO_x$ | oxides of nitrogen |
| NPDES | National Pollutant Discharge Elimination System |
| NRC | National Research Council |
| NRHP | National Register of Historic Places |
| NRRF | Naval Radio Receiving Facility |
| NRWQC | National Recommended Water Quality Criteria |
| NSR | New Source Review |
| NSW | Naval Special Warfare |
| NSWC | Naval Special Warfare Center |
| NTA | Navy Tactical Task (Action)s |
| NTTL | Navy Tactical Task List |
| NWR | National Wildlife Refuge |
| NWRC | National Wildlife Research Center |
| OAMCM | Organic Airborne Mine Countermeasures |
| OASIS | Organic Airborne Surface Influence Sweep |
| OPA | Oil Pollution Act |
| $O_3$ | Ozone |
| OPAREA | Operating Area |
| OPDS | Offshore Petroleum Discharge System |
| OPNAV | Office of the Chief of Naval Operations |
| OPNAVINST | Chief of Naval Operations Instruction |
| OSD | Office of the Secretary of Defense |
| OSP | Optimal Sustainable Population |
| OTB | Over-the-Beach |
| OUB | Operation Utility Boat |
| Pa | Pascals |
| PAH | polycyclic aromatic hydrocarbons |
| Pb | Lead |
| PACFLT | U.S. Pacific Fleet |
| PCB | polychlorinated biphenyls |
| PCFA | Pacific Coast Feeding Aggregation |
| PDM | Program Decision Memorandum |
| PE | Potentially Eligible |
| PETN | pentaerythritol tetranitrate |
| pH | hydrogen ion concentration (alkalinity) |
| PFMC | Pacific Fisheries Management Council |
| $PM_{2.5}$ | particulate matter less than 2.5 microns |
| $PM_{10}$ | particulate matter less than 10 microns |
| PMAR | Primary Mission Areas |
| POSD | Port of San Diego |
| PPA | Pollution Prevention Act |
| ppm | parts per million |
| ppt | parts per thousand |
| psi | pounds per square inch |
| R | Radius |
| RAQS | Regional Air Quality Strategy |
| RCA | Range Condition Assessment |
| RCD | Required Capabilities Document |
| RCRA | Resource Conservation and Recovery Act |
| RDT&E | Research, Development, Test, and Evaluation |
| RDX | Royal Demolition Explosive |
| RHA | Rivers and Harbors Act |
| RHIB | Rigid Hull Inflatable Boat |
| REFMS | Reflection and Refraction in Multilayered Ocean/Ocean Bottoms with Shear Wave Effects |
| RL | Received Exposure Levels |
| RMS | root mean squared |
| ROD | Record of Decision |
| ROG | Reactive Organic Gasses |
| ROI | Region of Influence |
| ROWPU | Reverse Osmosis Water Purification Unit |
| RRDF | Roll on/Roll Off Discharge Facility |
| RSD | Rare in San Diego County |
| RSEPA | Range Sustainability Environmental Program Assessment |
| RTSWS | Remote Training Site, Warner Springs |
| RV | Recreational Vehicle |
| RWQCB | Regional Water Quality Control Board |
| S | South |
| SAIA | Sikes Act Improvement Act |
| SALM | Single Anchor Leg Moor |
| SANDAG | San Diego Association of Governments |
| SANTEC | San Diego Traffic Engineers Council |
| SAR | Stock Assessment Report |
| SCAQMD | South Coast Air Quality Management District |
| SCB | Southern California Bight |
| SCE | Southern California Eddy |
| SCI | San Clemente Island |
| SCUBA | Self-Contained Underwater Breathing Apparatus |
| SDAB | San Diego Air Basin |
| SDIA | San Diego International Airport |
| SDUPD | San Diego Unified Port District |
| SDV | SEAL Delivery Vehicles |
| SEAL | Sea, Air, and Land |
| SEL | Sound Exposure Level |
| SIP | State Implementation Plan |
| SIT | Squadron Integrated Training |
| SLI | Slight Lung Injury |
| SMNWR | Sweetwater Marsh National Wildlife Refuge |
| $SO_2$ | Sulfur Dioxide |
| $SO_4$ | Sulfate |
| SOC | Special Operations Capable |
| SOCAL | Southern California |
| SOF | Special Operations Forces |
| SOP | Standard Operating Procedure |
| SPCC | Spill Prevention, Control, Countermeasures |
| SQT | Seal Qualification Training |
| SRA | Sub Regional Area |
| SR | State Route |
| SRO | Sustainable Range Oversight |
| SSLC | Silver Strand Littoral Cell |
| SSTC | Silver Strand Training Complex |
| SSNP | Silver Strand Natural Preserve |
| SSSB | Silver Strand State Beach |
| SUROBS | Surf Observations |
| SV | Sound Velocity |
| SVP | sound velocity profile |
| SWAG | Shock Wave Generator |
| SWDA | Solid Waste Disposal Act |
| SWFSC | Southwest Fisheries Science Center |
| SWRCB | State Water Resources Control Board |

| | |
|---|---|
| T&E | Test and Evaluation |
| TAP | Tactical Training Theater Assessment and Planning |
| TAR | Training Area and Range |
| TCP | Traditional Cultural Properties |
| Tf | Tidal Flats (soil type) |
| TL | transmission loss |
| TM | tympanic membrane |
| TMR | tympanic membrane rupture |
| TNT | Trinitrotoluene |
| TRAP | Tactical Recovery of Aircraft and Personnel |
| TRI | Toxic Release Inventory |
| TS | Threshold Shift |
| TSCA | Toxic Substances Control Act |
| TSD | Treatment, Storage, or Disposal |
| TSE | Tactical Support Equipment |
| TSNWR | Tijuana Slough National Wildlife Refuge |
| TSS | Total Suspended Solids |
| TTS | Temporary Threshold Shift |
| UAS | Unmanned Aircraft System |
| UJTL | Universal Joint Task List |
| U.S. | United States |
| USACE | U.S. Army Corps of Engineers |
| USAF | United States Air Force |
| USC | United States Code |
| USCG | U.S. Coast Guard |
| USDA | U.S. Department of Agriculture |
| USEPA | U.S. Environmental Protection Agency |
| USFWS | U.S. Fish and Wildlife Service |
| USIBWC | U.S. International Boundary Waters Commission |
| UUV | Unmanned Underwater Vehicle |
| UXO | Unexploded Ordnance |
| VFR | Visual Flight Rules |
| VSW | Very Shallow Water |
| W- | Warning Area |
| WRCC | Western Regional Climate Center |
| WQCA | Water Quality Control Act |
| yd | yard(s) |
| YMCA | Young Men's Christian Association |
| ZOI | zone of influence |
| ZOE | zone of exposure |

# 1 Purpose and Need for Proposed Action

# 1 PURPOSE AND NEED FOR PROPOSED ACTION

## 1.1 INTRODUCTION

The United States (U.S.) Department of the Navy (Navy) has prepared this Environmental Impact Statement (EIS) to assess the potential environmental impacts associated with ongoing and proposed naval training activities within the Navy's Silver Strand Training Complex (SSTC) and southern beaches and nearshore waters of Naval Air Station North Island (NASNI). SSTC is a critical Navy range for west coast naval amphibious, special warfare, and mine countermeasure training activities, and has been used by the Navy for military training for over 60 years.

SSTC is an integrated set of training areas located on and adjacent to the Silver Strand, a narrow, sandy isthmus separating the San Diego Bay from the Pacific Ocean. It is divided into two non-contiguous areas: SSTC-North (SSTC-N) and SSTC-South (SSTC-S). SSTC-N includes land areas on the northern-half of the Silver Strand peninsula, as well as adjacent nearshore waters of the Pacific Ocean and the San Diego Bay. SSTC-S includes land on the southern-end of the Silver Strand peninsula, as well as adjacent nearshore waters of the Pacific Ocean. SSTC-N and SSTC-S are separated by the Silver Strand State Beach. The NASNI training area is composed of the beaches and nearshore waters from Breaker's Beach to Zuniga Jetty, west of the City of Coronado. These areas are depicted in Figure 1-1.

The Navy is proposing to implement the follow actions within SSTC and the southern beaches and nearshore waters of NASNI: continue current training activities, increase training tempo from baseline conditions and the types of training, conduct existing routine training at additional locations within established training areas on SSTC and NASNI, introduce new platforms and equipment, and increase access to and availability of existing beach and inland training areas. The Navy is not proposing to increase the size of the SSTC or NASNI training areas. Details of the Proposed Action and alternatives are presented in Chapter 2.

The Navy needs to implement its Proposed Action to provide a training environment, with the capacity and capabilities to fully support required training tasks for operational units and military schools, to achieve and maintain the required levels of operational readiness as mandated by Title 10 of the United States Code (USC) Section 5062. Title 10 requires the Navy to organize, train, equip, and maintain combat-ready naval forces capable of winning wars, deterring aggression, and maintaining freedom of the seas.

The Proposed Action is designed to provide a training environment in which personnel can train and meet required levels of operational readiness. The decision to be made by the Assistant Secretary of the Navy (Installations & Environment) is to determine both the scope of training to be conducted and the nature of range improvements to be made within SSTC and the southern beaches and nearshore waters of NASNI, pursuant to the guidance provided in Title 40 of the Code of Federal Regulations (CFR) Section 1501.1.

The EIS identifies objectives and criteria for naval training activities at SSTC and the southern beaches and nearshore waters of NASNI to support an informed decision. The core of the EIS is the development and analysis of a reasonable range of alternatives that meet the purpose and need of the Navy's Proposed Action. Alternatives development is a complex process, particularly in the dynamic context of military training. The development of alternatives must meet the mandate for operational readiness. The criteria for developing and analyzing alternatives to meet these objectives are set forth in Chapter 2. Once alternatives are developed based on these criteria, analysis of the environmental effects of the alternatives is presented in Chapter 3.

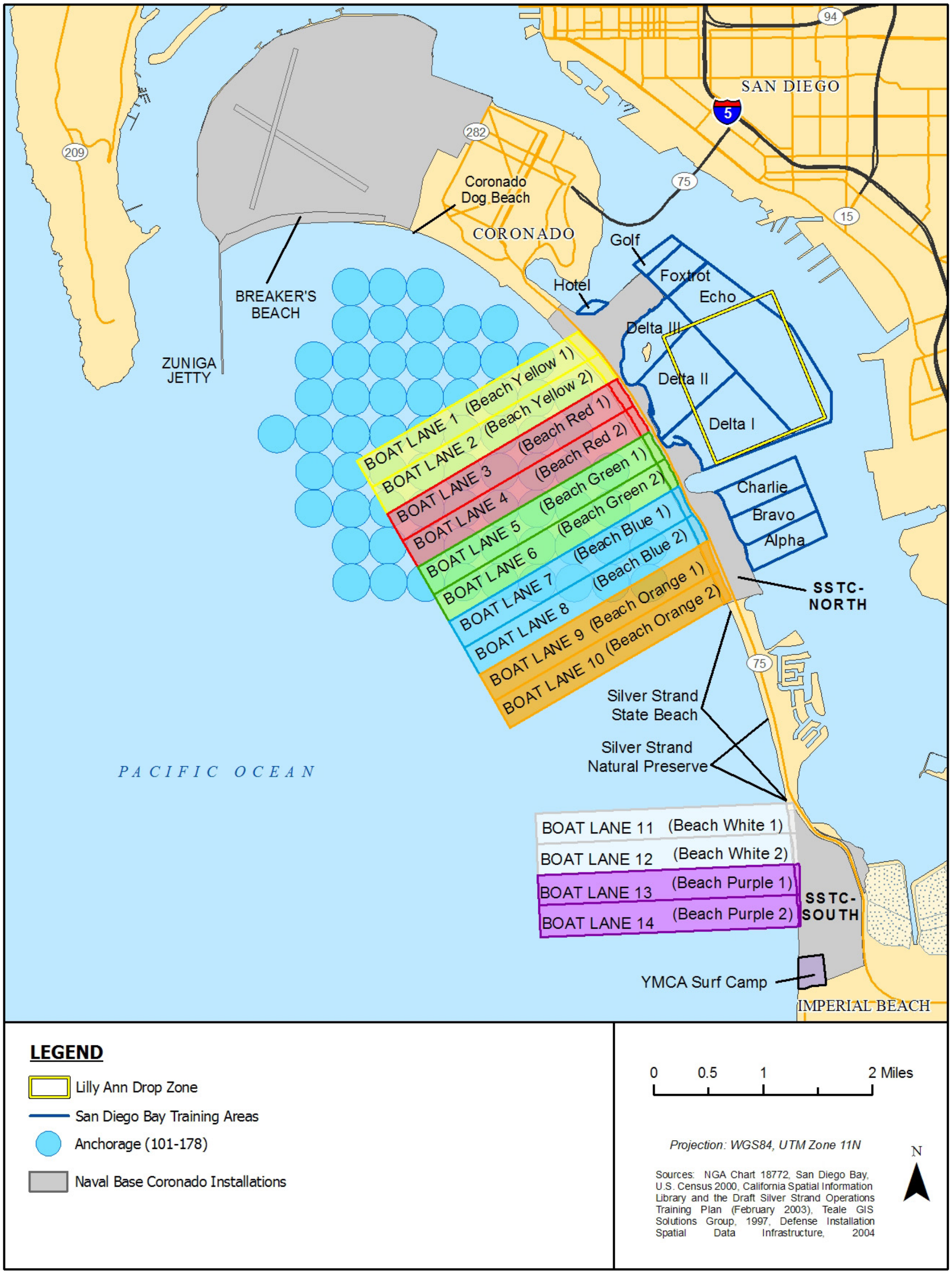


**Figure 1-1: Silver Strand Training Complex**

This EIS was prepared in compliance with the National Environmental Policy Act (NEPA), the Council on Environmental Quality (CEQ) Regulations for Implementing the Procedural Provisions of NEPA (40 CFR Parts 1500-1508), and Navy Procedures for Implementing NEPA (32 CFR Part 775). The Navy was the lead agency for this EIS; the National Marine Fisheries Service (NMFS) was a cooperating agency.

NEPA efforts leading to this EIS started in 1995 with the initiation of an environmental assessment (EA). In 1999, the Navy determined that preparation of an EIS, rather than the completion of the EA, for training activities on SSTC, as well as the southern nearshore area of NASNI, was necessary because of the high density of nesting birds that are federally threatened or endangered on oceanside training beaches at SSTC, as well as the level of potential impact from the proposed action.

## 1.2 OVERVIEW OF SSTC AND NASNI TRAINING AREAS

SSTC-N is composed of ten oceanside beach and boat training lanes (numbered as Boat Lanes 1-10; Yellow 1 & 2, Red 1 & 2, Green 1 & 2, Blue 1 & 2, and Orange 1 & 2), ocean anchorage areas (numbered 101 through 178), bayside water training areas (Alpha through Hotel), and bayside beaches (Alpha through Charlie, Delta North and Delta South) (Figure 1-2 and Table 1-1). The anchorages lie offshore of SSTC-N in the Pacific Ocean and overlap a portion of Boat Lanes 1-10. The SSTC-N consists of 745 acres of land owned by the federal government and approximately 257 acres leased by the State of California (described in Sections 3.1.1.4, 3.1.1.5, and 3.13.1.1.2). SSTC-S consists of four oceanside beach and boat training lanes (numbered as Boat Lanes 11-14), and inland training areas and facilities inside a fenced area (Figure 1-3 and Table 1-1). SSTC-S consists of approximately 548 acres of land owned by the federal government down to the high tide line. Due to a geographic mapping error, the northern boundary of SSTC-S appears on maps north of its correct termination point at the south end of Silver Strand State Beach. The Navy is working with NOAA to correct this error. No Navy training occurs along Silver Strand State Beach. In all, SSTC includes nearly 3.9 nautical miles (nm) of coastline (2.6 nm of coastline at SSTC-N and 1.3 nm of coastline at SSTC-S).

The southern beaches and nearshore waters of NASNI are geographically separate from SSTC-N and SSTC-S, located adjacent to, and bordering the western edge of the City of Coronado. Training associated with the Proposed Action occurs on the southern beach and nearshore training areas off of NASNI, from the rocky Zuniga Point and Jetty south to Breaker's Beach (Figure 1-1 and Table 1-1). The NASNI training area is also under federal ownership.

## 1.3 WHY THE NAVY TRAINS

The U.S. military is maintained at specific levels of operational readiness to ensure the freedom and safety of all Americans both at home and abroad. The Navy's mission to achieve operational readiness, 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."

Modern war and security operations are complex: modern military actions require teamwork between hundreds or thousands of people and their various equipment, vehicles, ships, and aircraft, all working individually and as a coordinated unit to achieve success. Navy training addresses all aspects of the team from individual to joint efforts, and coalition teamwork. To achieve this, the Navy employs a building block approach to training. Training doctrine and procedures are based on operational requirements for

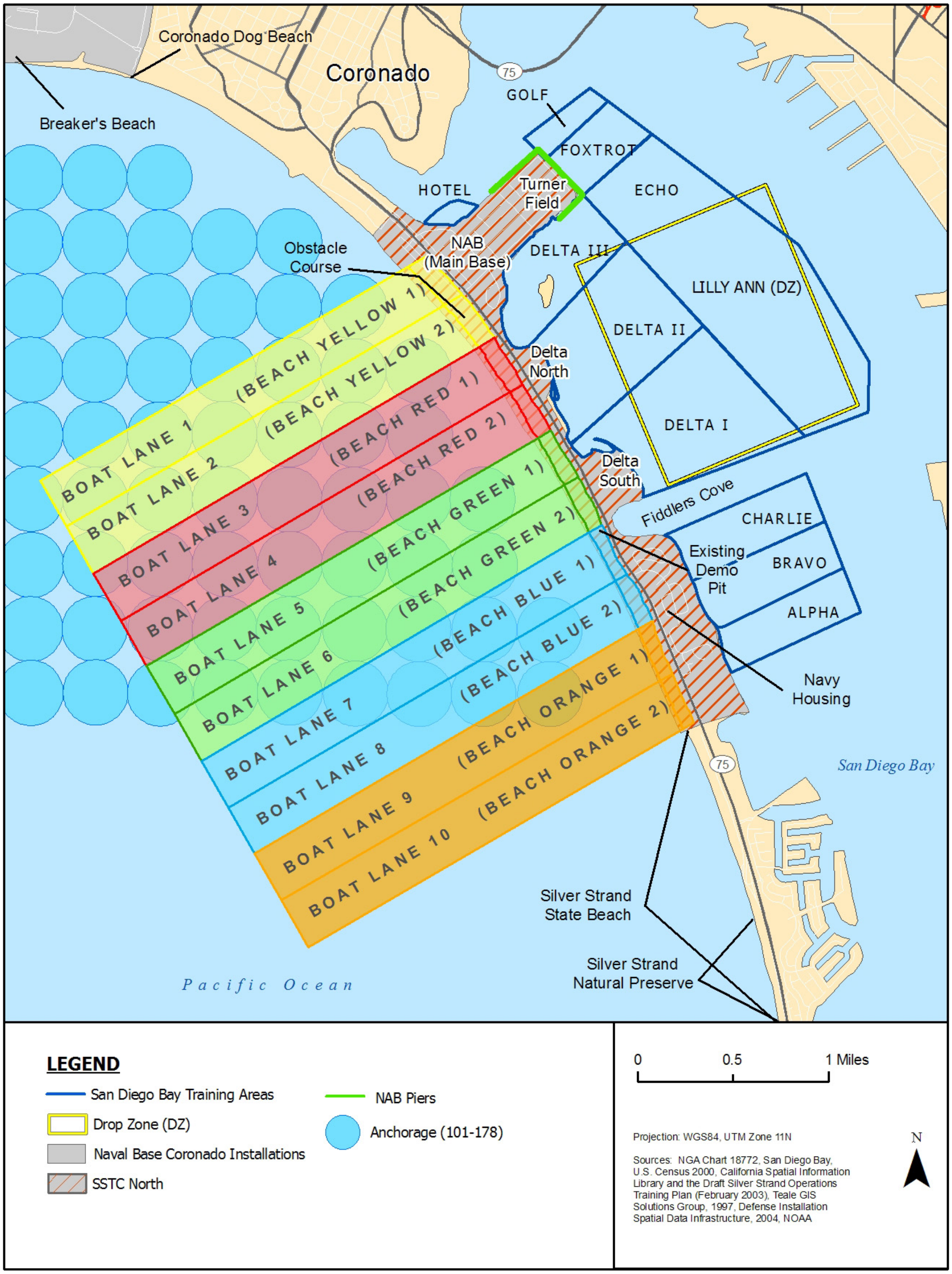


**Figure 1-2: SSTC-N Training Areas**

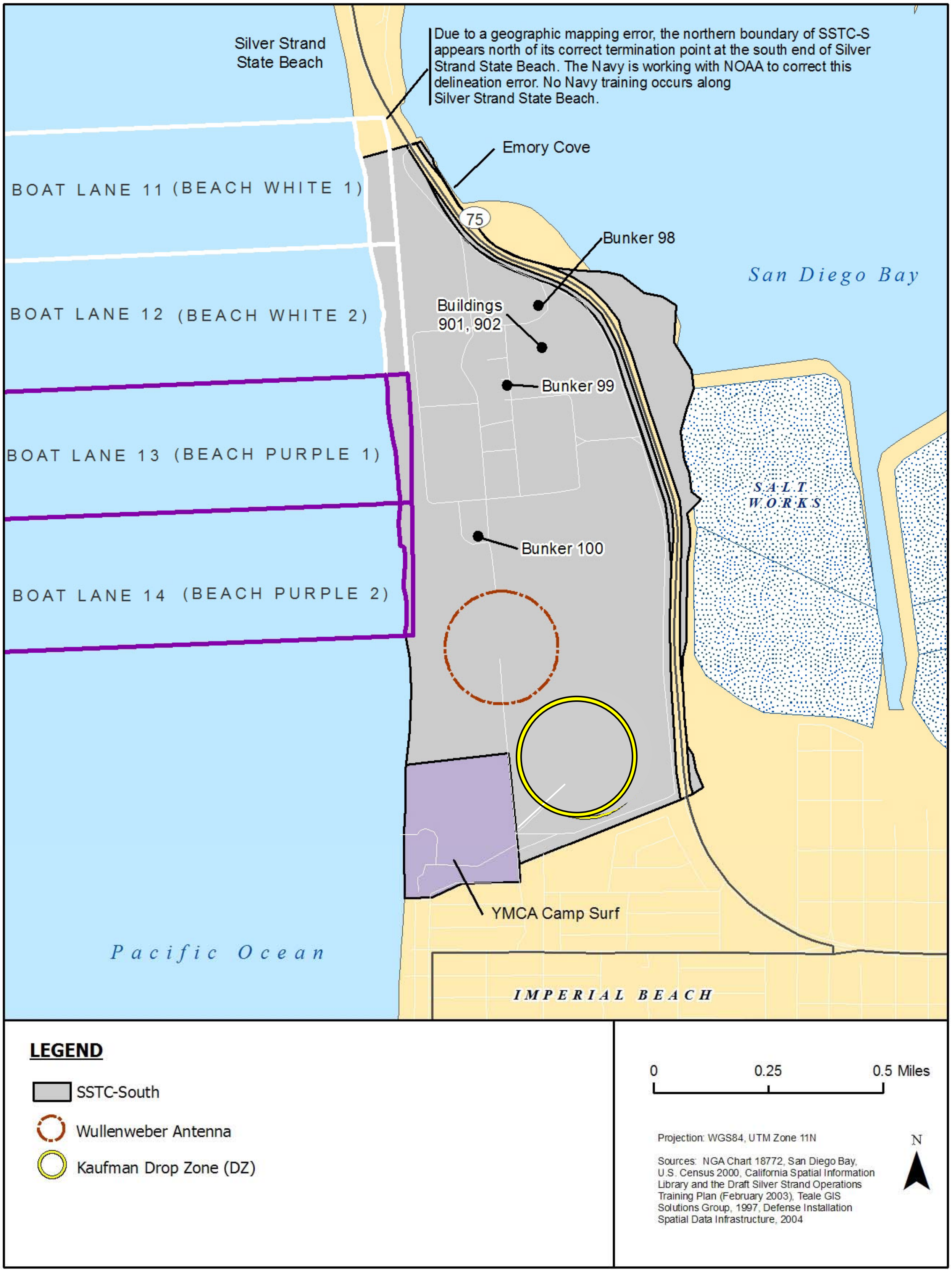


**Figure 1-3: SSTC-S Training Areas**

**Table 1-1: Summary of SSTC and NASNI Training Areas**

| Training Area | Description |
|---|---|
| Boat Lanes (1-10) and Beach Training Areas (SSTC-N) | The 10 ocean training lanes are each 500 yards wide stretching 4,000 yards seaward and forming a 5,000-yard-long contiguous training area. The boat lanes, similar to the beach areas, are identified by color and number (Yellow 1 through Orange 2, Figure 1-1). Each boat lane is 500 yards wide (1,000 yards per color) and follows the boat lanes by stretching 5,000 yards north to south. A demolition pit and obstacle course are located within the beach training areas. A rappel tower is located adjacent to the beach training area just inside the fenced compound. |
| Bayside In-water and Beach Training Areas (SSTC-N) | Bayside training beaches consist of Delta North and South, and Alpha through Charlie, as well as bayside in-water training areas, Alpha through Hotel. This area also includes the piers and Lilly Ann Drop Zone (DZ) (Figure 1-2). The Turner Field helipad is located on land within the NAB Coronado bayside areas (Figure 1-2). |
| Anchorages (SSTC-N) | Anchorages are numbered 101 through 178 and are 654 yards in diameter. They are grouped together in an area located primarily due west of SSTC-N, east of Zuniga Jetty and the restricted areas on approach to the San Diego Bay entrance (Figure 1-1). |
| Boat Lanes (11-14) and Beach Training Areas (SSTC-S) | There are four beach training areas as well as four contiguous boat lanes (11-14) at SSTC-S. The four ocean training lanes are each 500 yards wide stretching 4,000 yards seaward. Each boat lane (1,000 yards per color) follows the other boat lanes by stretching 2,000 yards north to south and are divided (for scheduling purposes) into White 1 and 2 and Purple 1 and 2. Each color section is 1,000 yards wide for a total of 2,000 yards (Figure 1-3). |
| SSTC Inland Areas (SSTC-S) | A multi-use facility located on land containing training infrastructure for use primarily by Naval Special Warfare (NSW) and Explosive Ordnance Disposal (EOD) forces, the Kaufman DZ is located at the south eastern corner of SSTC-S (Figure 1-3). A helipad is located adjacent to Building 902. |
| NASNI Training Areas | The NASNI training areas include the beaches and nearshore waters from Breaker's Beach to Zuniga Jetty and the nearshore waters surrounding NASNI (see Figure 1-1). |

deployment of naval forces. Training proceeds on a continuum—from the teaching of basic and specialized individual military skills (including schoolhouse training), to intermediate skills (or small unit training), to advanced, integrated training events, and finally culminating in multiservice (Joint) exercises, or pre-deployment certification (e.g., certification of combat readiness) events.

In order to provide experiences vital to success and survival, training must be as realistic as possible. In the early stages of training, the Navy often employs simulators and synthetic training to provide skill repetition and to enhance teamwork; but live training in a realistic environment is pivotal to the success of a mission and personnel survival. Realistic training requires sufficient land, sea, and airspace to maneuver tactically; further, this type of training requires realistic targets and objectives, the proper support equipment and on-range facilities, and an opposing force to create a realistic enemy.

Training ranges like SSTC provide a controlled and safe environment with threat-representative targets that enable U.S. forces to conduct realistic, combat-like training as they undergo all phases of the graduated buildup needed for combat-ready deployment. Navy ranges provide the space necessary to conduct controlled and safe training scenarios representative of those that military men and women would face in actual combat. The ranges are designed to provide the most realistic training in the most relevant environments, replicating as closely as possible the expected challenges. The integration of undersea ranges with land-based ranges, safety landing fields, and amphibious landing sites are critical to this realism, allowing real-time practice of complex scenarios. Live training is the cornerstone of readiness for U.S. military forces in a security environment characterized by uncertainty and surprise.

### 1.3.1 Predeployment Training

Predeployment training is governed by the Fleet Readiness Training Plan (FRTP). The FRTP establishes a training cycle that includes four phases: (1) maintenance; (2) unit-level training; (3) integrated training; and (4) sustainment. Established in 2003, the FRTP changed the Fleet training cycle, accelerating the cycle and necessitating near-simultaneous execution of similar training events. Navy forces must be ready to deploy with necessary force (or “surge”) on short-notice to directives from the commander-in-chief and the U.S. Secretary of Defense. One objective of the FRTP is to provide this surge capability. Deployment schedules are not fixed, but must remain flexible and responsive to the nation’s security needs. The capability and capacity of ranges such as SSTC to support the training continuum must be available when and as needed.

### 1.3.2 Schoolhouse Training

In addition to cyclical predeployment training governed by the FRTP, the Navy also has programs that train individuals that are newly reporting into Navy commands. Often called “schoolhouse” training, individual training is typically conducted in formal courses with syllabi and instructors including both classroom and field work. Individual training provides new military personnel with basic tactical knowledge, skills and abilities necessary for them to work within the unit and command to which they are assigned.

## 1.4 THE STRATEGIC IMPORTANCE OF THE SSTC

SSTC plays a vital part in the execution of the operational readiness mandate. SSTC has historically been, and continues to be, a critical training range for west coast naval amphibious, special warfare, and mine countermeasure activities.

### 1.4.1 SSTC Mission

The mission of SSTC is to support U.S. Navy and Marine Corps amphibious, special warfare, and mine countermeasure training by providing local land, sea, and airspace support services; materiel; and training facilities that will help Naval and Marine Corps forces achieve and maintain the highest level of operational readiness.

### 1.4.2 Strategic Attributes of SSTC

SSTC is critical to Navy training programs due to its unique combination of attributes that cannot be duplicated anywhere else in the world. These attributes are described below.

**Proximity to the Homeport of San Diego**. 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, including two aircraft carriers, over 70 surface combatant ships, amphibious ships, and submarines; several aviation squadrons; and their officers and crews. Supporting these naval forces are a range of naval installations in San Diego, including Naval Amphibious Base (NAB) Coronado, NASNI, Naval Outlying Field (NOLF) Imperial Beach, Naval Base Point Loma, and Naval Base San Diego. SSTC’s central location amongst these installations makes it a critical training range for multiple Navy commands headquartered on the installations. These commands are described in Section 1.4.3.

Local installations provide critical support to training on SSTC, including military command oversight for training, berthing and maintenance for vessel and aircraft used in training, housing for personnel being trained at SSTC, medical services for trainees, depots to supply training materials, and research and development services. The proximity of SSTC to equipment, personnel, facilities, and organizational services that are necessary for training at SSTC is vital to the execution of Navy training. SSTC provides an efficient training area for commands that are headquartered in San Diego; thereby enabling the commands to meet the aggressive schedules through which groups of trainees are cycled each year. Keeping up with these schedules is necessary to meet the manning needs of the Fleet and ensure readiness for troop deployment.

**Proximity to Other Training Ranges in the Southwest**. The Navy manages a concentrated network of training ranges in the southwestern United States, including SSTC. This network of ranges includes San Clemente Island, NASNI, Naval Air Facility El Centro, NOLF Imperial Beach, Naval Air Station Fallon, Remote Training Site Warner Springs, Naval Air Weapons Station China Lake, Camp Michael Monsoor and ocean and air areas (Warning Area [W]-291) off the coast of Southern California. This network anchors a west coast regional training capability which provides complementary training resources for different levels and types of training, and is the most capable and heavily used concentration of Navy ranges in the eastern Pacific Region. Naval forces utilize each of the range areas as appropriate, depending on the training to be accomplished, and the training resources of a given range. SSTC is a critical asset within this network of training ranges, particularly in amphibious and special operations training.

**Proximity to Military Families**. The region of San Diego is home to thousands of military families. Per NAVADMIN 300/6 (October 27, 2006), the Navy is required to limit "personnel tempo" (i.e., the amount of time sailors spend away from home). Personnel tempo is an important factor in morale and retention. The proximity of SSTC to NAB Coronado allows the Navy to limit the amount of time sailors spend away from home.

**Training Environment and Terrain**. The temperate, sub-tropical climate and the attendant dry summers of southern California allow for year-round training for Fleet readiness. The location of SSTC, with easy access to the oceanside's rough waters and the bayside's calm waters, allows personnel to start training in a calmer environment, and then quickly and easily transition to more challenging situations as their skills and fitness levels improve. SSTC is unique in this as there are no other training areas located in or around San Diego that have such a capability. Further, SSTC's long stretches of open and accessible beach areas, established ocean anchorages, and the varied and vegetated inland terrain of SSTC-S, make the area ideal for amphibious, special warfare, and mine countermeasure training.

### 1.4.3 SSTC Operational Users

SSTC is critical to a wide-range of commands and units, many of which are headquartered on SSTC. These commands have invested decades of resources within and adjacent to SSTC and rely on SSTC to perform their daily training activities.

Operational users conducting training at SSTC report to one of four major commands:

- Commander, Naval Surface Force, U.S. Pacific Fleet Commander, Naval Surface Forces (COMNAVSURFOR)
- Commander, Naval Special Warfare Command (COMNAVSPECWARCOM)
- Commander, Navy Expeditionary Combat Command (NECC)
- First Marine Expeditionary Force (I MEF)

**COMNAVSURFOR**. COMNAVSURFOR administers to assigned forces, conducts training, provides for logistics support, and exercises operational control of forces not assigned to other commanders as directed by Commander, U.S. Pacific. The mission of COMNAVSURFOR is to ensure maximum support is provided to maintain all surface units of the U.S. Pacific Fleet in the optimum state of training, readiness, discipline, and morale to ensure the maximum degree of readiness (Department of the Navy

[DoN] 2004). COMNAVSURFOR has a variety of subordinate commands that are headquartered on SSTC-N including Naval Beach Group 1 and Maritime Expeditionary Security Group 1.

**COMNAVSPECWARCOM**. COMNAVSPECWARCOM focuses on Special Warfare and is responsible for training, equipping, supporting, and providing trained and ready forces to combatant commanders (DoN 2004). COMNAVSPECWARCOM and a number of its subordinate commands are headquartered on SSTC including: Naval Special Warfare (NSW) Group 1 and Naval Special Warfare Center, which runs the Basic Underwater Demolition/Sea, Air, and Land (SEAL) (BUD/S) training program. This training program is held only at SSTC; every recruit needs to complete the BUD/S course in order to become qualified as a Navy SEAL. Classes are conducted throughout the year.

**Commander, NECC**. The mission of NECC is to organize, man, train, equip and maintain Navy expeditionary forces, be a global force provider of naval expeditionary capabilities to warfighting commanders, and to extend the maritime battlespace. NECC also provides effective waterborne and ashore anti-terrorism, force protection, and humanitarian assistance/disaster relief contingencies. Upon request, NECC supplements U.S. Coast Guard (USCG) homeland security requirements while training and equipping forces to support mission requirements. NECC has a number of subordinate commands that are headquartered on SSTC-N including: Explosive Ordnance Disposal Group 1 and Expeditionary Warfare Training Command Pacific (EWTGPAC) which have schools on SSTC. The schools provide scheduled year-round training for Navy sailors and Marines on SSTC.

**I MEF**. I MEF is located at Marine Corps Base Camp Pendleton (MCB CP). The mission of I MEF includes the training and predeployment certification of Marines, Marine units, and Marine Air Ground Task Forces. I MEF conducts the majority of its training on MCB CP, but occasionally trains at SSTC to diversify its training.

### 1.4.4 Training Activities at SSTC

Most of the training conducted at SSTC is individual-level, schoolhouse training discussed in Section 1.3.2. Two commands conduct individual-level schoolhouse programs at SSTC: NSW and EWTGPAC. NSW's BUD/S program and SEAL Qualification Training build individual tactical abilities in multiple areas, including basic physical fitness, movement from water/air to land, reconnaissance, and basic field skills. EWTGPAC runs two individual-level and unit-level training programs at SSTC: The Strategic Sealift program trains personnel in basic skills associated with the logistical movement of equipment and supplies from ship to shore; the Marine Raid and Troop Training Program prepares individuals and unit-level teams in a variety of areas, including survival in-water, raids onto the beach, and reconnaissance.

Integrated and sustainment phase training are also conducted at SSTC, to a lesser extent. Integrated phase training combines the elements of unit training into larger engagements in a simulated higher-threat environment. Integrated training differs from unit level training in complexity, intensity, duration, and level of threat. Sustainment phase training combines all the elements of the integrated phase into coordinated large-scale missions in a high-threat, combat environment in the period prior to deployment. Integrated and sustainment exercises are infrequent and occur primarily at sea, only occasionally including a small portion of SSTC.

### 1.4.5 Navy Tactical Tasks at SSTC

The content of U.S. military training is directed by the Chairman, Joint Chiefs of Staff, who publishes the *Universal Joint Task List* [CJCSM 3500.04D]. Each of the military services develops specific statements of required tactical capabilities so military units are effective in organizing and maneuvering forces in battle to achieve a limited or immediate goal. The staff of the Office of the Chief of Naval Operations published the *Navy Tactical Task List 3.0*, January 30, 2007, which provides the organizing structure of the training activities. Naval tactical capabilities are organized around seven major categories by Navy Tactical Task (NTA)/Marine Corps Task; four of the seven tasks are conducted at SSTC (Deploy/Conduct Maneuver, Develop Intelligence, Perform Logistics and Combat Service Support, and Protect the Force). Each major task is further defined by a hierarchy of subordinate tasks; detailed discussions of NTA subtasks that are currently performed or proposed at SSTC are described in Chapter 2.

## 1.5 PURPOSE AND NEED FOR THE PROPOSED ACTION

The purpose of the Proposed Action is to improve the availability and quality of training opportunities at SSTC to achieve required levels of operational readiness. In order to meet training requirements, the Navy proposes to continue current training activities, increase training tempo and types of training, conduct existing routine training at additional locations within SSTC's established training areas, and increase access to and availability of existing beach and inland training areas. A detailed description of the Proposed Action is provided in Chapter 2.

The Proposed Action is needed to provide a training environment consisting of training areas and range facilities with the capacity and capabilities to fully support required training tasks for operational units and military schools and meet the operational readiness requirements of Title 10 of the USC (10 USC 5062). The Navy has three primary needs that must be fulfilled to meet these requirements:

- continue current training and increase the number of existing training activities and introduce new training activities and platforms in support of FRTP and surge requirements;
- provide assured year-round access and unencumbered use of training areas to meet current and future training needs per the Navy Tactical Task List; and
- provide a training range and training facilities that afford operational commands the flexibility to achieve diverse and realistic training at SSTC.

Each of these three needs is discussed in detail below. The Proposed Action would result in selectively focused, but critical enhancements and increases in training that are necessary if the Navy and Marine Corps are to maintain a state of military readiness commensurate with the national defense mission.

#### 1.5.1.1 Need for Increased and Improved Training at SSTC

The Navy and Marine Corps are continuously adapting to meet changing military readiness requirements. Changes within the Navy and Marine Corps are transforming and increasing the training requirements on SSTC:

- The Navy's approach to pre-deployment training (the FRTP), that requires a unit be ready to deploy much earlier in the pre-deployment training cycle (i.e., the ability to surge-deploy). These training cycles require operational commands to increase their training tempos.
- U.S. Special Operations Command's force expansion and restructuring per the December 2002 Office of the Secretary of Defense Program Decision Memorandum, which includes the increase of Naval Special Warfare personnel operating on NAB Coronado, equivalent to one additional SEAL team.
- The Navy's Total Force Strategy, under which EOD groups have initiated a forcewide realignment which emphasizes right-place, right-time training and has necessitated expanded use of Southwest Region training venues, including SSTC.

- The Congressionally-authorized surge in the strength of the Marine Corps to 202,000 active-duty personnel per the 2008 National Defense Authorization Act (Public Law 110 – 181 [H.R. 4986]) will in turn increase the number of Marine Corps personnel cycling through EWTGPAC training programs at SSTC.
- Introduction of new platforms, training equipment and service life extension programs for existing equipment require Navy personnel to begin new training on the new/upgraded equipment while continuing to train on existing equipment.

These changes reflect increasing and additional requirements for capabilities by overseas operational commanders like Central Command in Iraq and Afghanistan, and a need to accommodate increases in the number of personnel based in the southern California region. They'll require an increase in training types and tempos at SSTC and North Island and the incorporation of new platforms (e.g., aircraft and equipment) into training at SSTC. They also will require better use of existing training areas within SSTC, but not an expansion of SSTC.

#### 1.5.1.2 Need for Year-round Access to Training Areas

In 1983, the Navy initiated consultations under the Endangered Species Act (ESA) because of the Navy's proposed action to construct facilities in support of the Light Airborne Multipurpose System MK III. In preparation for the consultation, the Navy concluded that the proposed action may affect about 68 California least tern nests. California least tern is a federally-listed endangered bird under the ESA, and its displacement triggered a Section 7 consultation under ESA with the U.S. Fish and Wildlife Service (USFWS). One of the results of the consultation was that 75 acres of Navy training beach at Delta North and South (Figure 1-2) were fenced and set aside as California least tern nesting areas. In 1984, the Delta beaches were formally designated as a least tern preserve and are not part of the areas utilized under the Proposed Action.

Since then, the California least tern population has increased tenfold on SSTC, now reaching over 1,400 nests. In addition, the California least tern has expanded its nesting range outside of Delta North and South, into and throughout SSTC-N's oceanside beach training lanes (Lanes 1 through 10). Throughout this period, the Navy has engaged in recurring ESA Section 7 consultations with the USFWS, with attention to ongoing military training on these lanes, and has implemented varying strategies to adapt to the growing California least tern nesting population and evolving Navy training needs at SSTC. These recurring consultations were conducted in parallel with the development of this EIS.

Under Biological Opinion FWS-SDG-3452.3 (10 March 2005) and associated extensions, the Navy sets aside three beach training lanes (Lanes 8, 9, and 10) for California least tern nesting from the beginning of April through September each year, in addition to expanded Delta North and South areas. The Navy restricts its training on these three training beaches for 6 months out of the year.

In anticipation of potential increased training at SSTC, the Navy has conducted modeled schedule projections of future training to assess its near-future needs for the SSTC-N beach training areas (see Section 3.12.3.1). Results showed that the remaining seven SSTC-N oceanside beach lanes (Lanes 1 through 7) will be insufficient to support future training tempo requirements. As such, the Navy needs additional year-round training space to support future deployment schedules and personal tempo requirements.

#### 1.5.1.3 Need for Flexibility and Realistic Training

SSTC is located in a populated coastal area, and its use for realistic military training is constrained by adjacent residential, commercial, recreational, cultural, and sensitive natural resource uses. Operational constraints on training areas at SSTC make it challenging for Navy commands to support emerging and expected future training requirements. A training range that realistically simulates environments that operators will encounter overseas, and prevents encumbrances that adversely affect training, is an ongoing need of commands that train at SSTC.

## 1.6 THE ENVIRONMENTAL REVIEW PROCESS

NEPA requires federal agencies to examine the environmental effects of their Proposed Actions. This EIS is a detailed public document that provides an assessment of the potential environmental impacts associated with a proposed major federal action. The impacts to be analyzed are those that occur to the human environment, including natural and physical resources. The Navy is the lead agency for this EIS. NMFS is a cooperating agency, pursuant to 40 CFR Section 1501.6. NMFS has jurisdiction by law and special expertise on environmental issues that are being addressed in this EIS.

### 1.6.1 NEPA Public Participation

The first step in the NEPA process is the publication of the Notice of Intent (NOI) by the action proponent after the decision is made to prepare an EIS. The NOI provides an overview of the proposed action and invites the public to participate in identifying the significant issues deserving of study (i.e., participate in scoping). The Navy initiated the process for determining the scope of issues by publishing a NOI to prepare an EIS in the *Federal Register* (66 FR 41009) on August 6, 2001. Copies of the NOI and the Agency Scoping Package were mailed to local, state, and federal elected officials; regulatory agencies; local municipal jurisdictions; public service providers; and other parties known or expected to be interested in the Proposed Action. A copy of the NOI is provided in Appendix A.

Scoping is an early and open process for developing the scope of issues to be addressed in the EIS and for identifying issues related to a Proposed Action. During scoping, the public helps define and prioritize issues and convey these issues to the Navy through written comments. As part of the EIS scoping process, the Navy held meetings on August 28, 2001, in Coronado, CA, and on August 29, 2001, in Imperial Beach, CA., which were designed to inform the public of the Proposed Action and to solicit the public's participation and comments. The meetings were advertised and the NOI was published in the *San Diego Union-Tribune* from August 6-8, 2001, in the *Coronado Eagle* on August 8, 2001, and in the *Imperial Beach Times* on August 9, 2001. At each meeting, Navy representatives provided an overview of the Proposed Action and alternatives, the NEPA process, training exercises at SSTC, and potential environmental issues on SSTC. Comment sheets were distributed for the public to submit their concerns and comments. A court reporter also was available at each meeting to record oral comments.

Independent of the public scoping meetings, the Navy conducted additional focused interviews. These interviews occurred during the 45-day comment period (and the additional 30 day extension of the comment period) and were designed to gather input from local city officials, regulatory agencies, and environmental organizations. Individual meetings were conducted between the Navy and the following:

- Audubon Society
- California Coastal Commission
- California Department of Fish and Game
- California Department of Parks and Recreation
- San Diego Regional Water Quality Control Board
- California State Lands Commission
- City of Imperial Beach

- National Marine Fisheries Service
- San Diego Association of Governments
- San Diego Unified Port District
- Sierra Club
- Southwest Fisheries Science Center
- United States Coast Guard Marine Safety Office
- United States Fish and Wildlife Service
- YMCA

Participants in the scoping process identified several areas of interest and concern, and ideas for alternatives to the Proposed Action, which are addressed throughout this EIS. The scoping process resulted in commentary on a variety of topics; the majority of comments received were related to the description of alternatives, other training alternatives, snowy plovers and least terns, marine resources, threatened and endangered species, and effects on environmental health, safety, and recreation.

Subsequent to the scoping process, the Draft EIS was prepared to assess the potential effects of the Proposed Action and Alternatives on the environment.

The Notice of Availability of the Draft EIS and Notice of Public Hearings was published in the Federal Register on January 22, 2010 (75 FR 1768) and notices were placed in the *San Diego Union-Tribune*, *Coronado Eagle*, and in the *Imperial Beach Times* announcing the availability of the EIS. The Navy held two public hearings, February 23 in Imperial Beach, CA and February 24, 2010, in Coronado, CA. After receiving initial comments during the 45-day comment period, the Navy extended the response period by 30 days to allow the public additional time to review and comment on the Draft EIS. The Draft EIS was distributed to those individuals, agencies, and associations who asked to be notified during the public scoping period, as well as to members of Congress, the California governor, and officials in the coastal region surrounding the SSTC Study Area. Additionally, the EIS was made available for general review at two information repositories in the local area, and on the project website (www.silverstrandtrainingcomplexeis.com). A total of 108 individuals and 22 agencies and organizations submitted comments on the Draft EIS.

This Final EIS responds to public comments received on the EIS. Responses to public comments may take various forms as necessary, including correction of data, clarifications of and modifications to analytical approaches, and inclusion of additional data or analyses.

The Notice of Availability of the Final EIS was published in the Federal Register by the EPA and notices were placed in the *San Diego Union-Tribune*, *Coronado Eagle*, and in the *Imperial Beach Times* announcing the availability of the Final EIS. Notification of the availability of the Final EIS was sent to interested individuals, agencies, and associations, as well as elected and other public officials. The Final EIS was distributed to those individuals, agencies, and associations who asked to be notified during the public comment period, as well as members of Congress, the Governor of California, and officials in the coastal region surrounding the SSTC Study Area. Additionally, the SSTC EIS was made available at two local information repositories and on the project website (www.silverstrandtrainingcomplexeis.com).

Finally, a Record of Decision (ROD) will be signed by the Assistant Secretary of the Navy (Energy, Installations & Environment) and be issued, no sooner than 30 days after this Final EIS is made available to the public. The ROD summarizes the Navy's decision and identifies the selected alternative, describes the public involvement and agency decision-making processes, and presents commitments to specific mitigation measures.

### 1.6.2 Other Environmental Requirements Considered

The Navy must comply with a variety of other federal environmental laws, regulations, and Executive Orders (EOs). These include (among other applicable laws and regulations) the following:

- Clean Air Act
- Coastal Zone Management Act
- Endangered Species Act
- EO 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations
- EO 13045, Protection of Children from Environmental Health Risks and Safety Risks
- Federal Water Pollution Control Act (Clean Water Act)
- Magnuson-Stevens Fishery Conservation and Management Act
- Marine Mammal Protection Act
- Migratory Bird Treaty Act
- National Historic Preservation Act
- Resource Conservation and Recovery Act
- Rivers and Harbors Act

The Navy has consulted with regulatory agencies as appropriate during the NEPA process and prior to implementation of the Proposed Action to ensure requirements are met. A full description is provided in Chapter 6 and Appendix G provides a list of the Silver Strand Training Complex (SSTC) regulatory agency consultation documentation. Agency correspondence and supporting documentation can be found on the SSTC EIS website at www.silverstrandtrainingcomplexeis.com.

In addition, laws and regulations of the State of California appropriate to Navy actions are identified and addressed in this EIS. This EIS will facilitate compliance with applicable, appropriate state laws and regulations.

## 1.7 RELATED ENVIRONMENTAL DOCUMENTS

According to CEQ regulations for implementing NEPA, material relevant to an EIS may be incorporated by reference with the intent of reducing the size of the document (40 CFR 1502.21). Some of the programs and projects at the SSTC that have undergone, or are undergoing, environmental review and documentation to ensure NEPA compliance, and which are incorporated herein by reference, are listed below. All listings are authored by the Navy:

- EA for the Naval Base Coronado Integrated Natural Resources Management Plan (INRMP) (DoN 2002a)
- EA for the San Diego Bay INRMP (DoN 2001)
- Final EIS for Advanced Amphibious Assault Vehicle (DoN 2003)

- Final Supplemental EIS for Developing Home Port Facilities for Three NIMITZ-Class Aircraft Carriers in Support of the U.S. Pacific Fleet (DoN 2008a)
- Marine Resource Assessment for the Southern California (SOCAL) Operating Area (DoN 2005)
- Naval Base Coronado INRMP (DoN 2002b)
- Programmatic EA for Grow the Force Permanent Bed Down Facilities at Marine Corps Base Camp Pendleton (DoN 2009)
- San Diego Bay INRMP (DoN 2000)
- San Diego Metropolitan Area Programmatic Agreement (DoN 2003)
- SOCAL Range Complex Final EIS/Overseas EIS (DoN 2008b)

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# 2 Description of Proposed Action and Alternatives

# 2 DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES

As presented in Chapter 1, the Navy proposes to implement actions within the Silver Strand Training Complex (SSTC). There are five main components of the Proposed Action:

- the continuation of current training and test and evaluation (T&E) activities conducted within the study area;
- an increase in training tempo from baseline conditions and additions to types of training;
- the carrying out of existing, routine training at additional locations within SSTC established training areas;
- the introduction of new platforms and equipment; and
- increased access and availability to existing beach and inland training areas.

Through implementation of the components listed above, the Proposed Action would support mission-oriented requirements for SSTC through an increase in diverse and realistic training and improved accessibility to training areas.

## 2.1 OVERVIEW OF PROJECT ALTERNATIVES

### 2.1.1 Alternatives Development

National Environmental Policy Act (NEPA) implementing regulations provide guidance on the consideration of alternatives in an Environmental Impact Statement (EIS). The Navy is required to rigorously explore and objectively evaluate all reasonable project alternatives; further, the Navy is required to briefly discuss the reasons for not evaluating those alternatives that were eliminated from further consideration and detailed study (40 Code of Federal Regulations [CFR] 1502.14).

Alternatives must also include a No Action Alternative. The No Action Alternative ensures that agencies compare the potential impacts of a proposed major Federal action to the known impacts of maintaining the status quo. The potential impacts of the No Action Alternative are compared to the potential impacts from activities proposed under Alternative 1 and Alternative 2.

### 2.1.2 Criteria for Developing Alternatives

The alternatives were developed by the Navy after careful assessment by subject-matter experts, including units and commands that utilize SSTC, Navy environmental managers and scientists, and the consideration of public comments received during scoping. The Navy has developed a set of criteria for use in assessing whether a possible alternative meets the purpose of and need for the Proposed Action (see Section 1.5):

1. Must meet the requirements of individual and unit-level training;
2. Must have sufficient available and suitable training space to simultaneously accommodate the training needs of all of the operational users described in Section 1.4.3 so that they can achieve training tempo requirements based on Fleet deployment schedules;
3. Must meet future training requirements with year-round, assured access to San Diego Bay, ocean, beach, and inland training areas;
4. Must provide a realistic training environment that simulates real world littoral combat conditions and is free of man-made restrictions/objects that interfere with preparing servicemen for operations in real-world conditions;

5. Must complete the full range of required training elements at SSTC;
6. Must provide co-location with commands, equipment, facilities, and infrastructure on Naval Amphibious Base (NAB) Coronado that support existing and future training and meet training and personnel tempo requirements described in Section 1.4.2.

### 2.1.3 Alternatives Eliminated from Further Consideration

#### 2.1.3.1 Alternate Training Complex Locations

Historically, as discussed in Section 1.4, SSTC continues to be a critical training range for the west coast naval amphibious and special warfare activities. SSTC derives its unique value and high utility for training of naval forces from its unique environment and terrain, as well as its proximity to the homeport of San Diego, other training ranges in the southwest, and military families. Local installations host naval organizations that provide military command oversight, facilities management, vessel and aircraft maintenance, depots to supply materials, and research and development services. The proximity of SSTC to equipment, personnel, facilities, and organizational services that are necessary for training at SSTC is vital to the efficient execution of Navy training. Training ranges outside of the San Diego area do not meet criterion #6, above, to provide co-location of commands, equipment, facilities and infrastructure that support existing and future training to meet training and personnel tempo requirements. SSTC is critical to Navy training programs due to its unique combination of attributes that cannot be duplicated. These unique attributes and training resources are described in detail in Section 1.4.2. These critical training resources are concentrated on SSTC, NAB Coronado, and portions of Naval Air Station, North Island (NASNI).

Other military training areas located within the San Diego area, such as the Marine Corps Base (MCB) Camp Pendleton, San Clemente Island, Remote Training Site Warner Springs (RTSWS), do not meet the criterion necessary for amphibious and special warfare training (i.e. criterion #4). Further, these other training areas already sustain their own training activity schedules and priorities; thus, they would be unable to meet the tempo requirements of criterion #2. The points below—describing why MCB Camp Pendleton is not a feasible relocation site—provide examples as to why relocation is not feasible.

1. Most training involves a large number of personnel, slow-moving barge-type vessels, inflatable vessels, and/or heavy equipment, all of which are stationed and maintained in housing/command facilities, piers, and yards on NAB Coronado. None of these could be quickly moved on a daily basis back and forth from NAB Coronado to Camp Pendleton. Most basic training schedules already take the full working day without transport time. Training activities are integrated with other types of activities in the same day using necessary facilities, personnel, and command infrastructure on NAB Coronado. Additional transport time back and forth from NAB Coronado and Camp Pendleton would hinder the commands' abilities to meet both tight deployment schedules and personal tempo requirements.

2. The training environment at Camp Pendleton is not appropriate for most types of training that is conducted at SSTC. For example, the underwater terrain has a much steeper grade as it approaches the beach at Camp Pendleton. The deeper water is a safety hazard for new personnel who are learning basic skills crossing the hazardous and challenging surf conditions. Camp Pendleton is a more appropriate environment for integrated training exercises where personnel are more experienced in handling the rough surf conditions.

3. Camp Pendleton does not offer 3.9 nautical miles of coastline necessary for relocation of Navy training. Most of Camp Pendleton's coastline is encumbered by sensitive natural resources, some similar to those at SSTC, and unavailable for Navy training. Camp Pendleton's remaining available coastline is already heavily scheduled for Marine Corps training and would not be able to sustain the additional load of SSTC training.

4. Camp Pendleton does not offer calm water necessary for most types of training. New personnel need to begin learning in calmer, safer waters and, only after they have mastered the calmer waters, transition into the rougher ocean surf waters. SSTC offer large open areas of calm San Diego Bay water where multiple commands can simultaneously train.

For the rationale described above, alternate training locations have been eliminated from further consideration in this EIS.

#### 2.1.3.2 Training Relocation to SSTC-S

An alternative that would relocate part of or all training activities from SSTC-North (SSTC-N) to SSTC-South (SSTC-S) was originally presented in the Notice of Intent for SSTC EIS as a component of Alternative 2 (Appendix A). The Navy considered the location of all of the training activities conducted on SSTC. Many training activities are already conducted on SSTC-S. The Navy considered each of the remaining activities on SSTC-N and found that it was not feasible to relocate them to SSTC-S because of its infrastructure and because of increased time requirements associated with planning, logistics, and training.

SSTC-S beach lanes do not have the same physical attributes as their northern counterparts. The four boat lanes are more shallow in depth and do not provide adequate space for many activities, resulting in restricted maneuvering areas. The surf in front of SSTC-S has more sand bars, reducing its accessibility for landing craft and there are no charted anchorage sites or moorings, which are required for some activities. Activities involving groups on foot originating out of housing and/or classrooms on SSTC-N would be infeasible because of the additional travel distance to SSTC-S—between two and six miles each way. Many training activities require facilities on SSTC-N that are not available on SSTC-S, including the extensive obstacle course on SSTC-N. Thus, this alternative cannot meet criterion #5 above because of the inability to train due to constraints or lack of resources at SSTC-S.

In addition, the time required for planning, logistics, and transport would be increased if activities were relocated to SSTC-S. Most training involves a large number of personnel who typically move to the training site on foot, slow-moving barge-type vessels, inflatable vessels, and/or slow-moving tracked heavy equipment, all of which are stationed and maintained in housing/command facilities, piers, and yards on NAB Coronado. None of these could be quickly moved on a daily basis back and forth from NAB Coronado to SSTC-S. The increased logistics hurdles could interfere with execution of training, such as planning around lack of immediate highway access and procurement and ensuring the accessibility of logistical transport vehicles. In addition, more logistical time would be required to transport the personnel, equipment and transition vessels berthed on NAB Coronado to the designated training site. Most basic training schedules are full curriculums that already take the full working day without additional transport time. Training activities are integrated with other types of activities in the same day using necessary facilities, personnel, and command infrastructure on NAB Coronado. Additional transport time back and forth from NAB Coronado and SSTC-S would add time to curriculums that are already packed and hinder the commands' abilities to meet both tight deployment schedules and personal tempo requirements.

In addition, SSTC-S low-tide beaches are used by the public, while public use of all areas of SSTC-N beaches are restricted. This public usage would create additional training concerns and conflict with many activities in terms of safety (e.g., heavy equipment usage), security (clandestine attacks), and training realism. For the reasons outlined in this discussion, a relocation of training from SSTC-N to SSTC-S was eliminated from further consideration in the EIS.

#### 2.1.3.3 Training Reductions

Reductions in training from current levels at SSTC would not support the Navy's ability to meet training requirements consistent with the Fleet Readiness Training Plan (FRTP) (criteria #2 and #6). A reduction in the types, or tempo of training activities available at SSTC would mean that local units/users would have to routinely travel to other range complexes to fulfill training requirements. As outlined in Section 2.1.3.1, this is not a feasible alternative. For these reasons, this alternative has been eliminated from further consideration in the EIS.

#### 2.1.3.4 Simulated Training

An alternative that would rely entirely on computer-simulated training would not meet the purpose and need for the Proposed Action (Section 1.5). Although computer simulation is used to enhance combat performance, sailors and marines must be able to practice communicating, maneuvering, operating, repairing equipment, and firing weapons in as high-stress and realistic an environment as is possible, for days at a time, in order to achieve necessary levels of proficiency. Currently, the Navy (and Marine Corps) makes use of computer-simulated virtual training environments—the Navy conducts command and control activities without operational forces (constructive training) where possible. These training methods have substantial value in achieving limited training objectives. Computer technologies provide excellent tools for implementing a successful, integrated training program while reducing the risk and expense associated with military training. However, virtual and constructive training are an addition to, not a substitute for, live training. Unlike live training, simulated training does not provide the requisite level of training or realism necessary to attain combat readiness and simulated training cannot replicate the high-stress environment encountered during an actual contingency situation (criterion #4 above). Therefore, this alternative was eliminated from further consideration.

#### 2.1.3.5 Construction and Use of Demolition Pit at SSTC-S

An alternative that would construct a land demolition pit at SSTC-S for land detonation training was evaluated. Training activities evaluated under this alternative consisted of the detonation of explosives using various Net Explosive Weight (NEW) charges, up to 5 lbs, to fulfill requirements associated with explosive ordnance disposal and special warfare training. The Navy conducted noise modeling to predict the impulse sound levels the neighboring residences, recreational users, natural resources, etc., that use the land surrounding SSTC-S might experience from detonations in the proposed demolition pit. The Navy also evaluated other locations outside of SSTC for installation of demolition pit. In the end, the Navy found other potential locations and a different preferred location for land demolition training and will conduct separate NEPA documentation on these locations in the future as appropriate.

#### 2.1.3.6 Allow Unrestricted Usage of Training Lanes 8, 9, and 10 if California Least Tern Nesting Threshold is Reached

The Navy originally considered allowing full-year, unrestricted usage of Blue 2, Orange 1, and Orange 2 beach lanes for training if 1,120 California least tern nests occur the previous year on Naval Base Coronado (NBC) property excluding nests in the lanes(s) (Blue 2, Orange 1, and/or Orange 2). If the nesting threshold was not met, the lanes would not be opened except in other proposed alternatives**.** The intent of this consideration was to allow for unencumbered training while still ensuring a high level of California least tern nesting at SSTC. Under the nesting threshold of 1,120, the Navy would maintain more than its currently high percentage of breeding pairs (15 to 20 percent) at NBC necessary to support a viable population (5,000 pairs, as stated in Akcakaya et al. 2003). The California least tern nesting threshold was calculated as follows:

*NP = Number of pairs needed rangewide to maintain a viable population = 5,000 pairs, as provided in most recent population viability assessment (PVA) by Akcakaya* et al. *in 2003.*

*R = Ratio between nests observed statewide in a given year (8,173 nests in 2006) and the average between the estimated minimum and maximum number of breeding pairs statewide in the same year [(7,006 pairs + 7293 pairs) / 2], using 2006 data provided in the CDFG California Least Tern Breeding Survey (*Marschalek *2007) (i.e. 8,173 nests / 7,149.5 = 1.143 nests/pair).*

*NBCF = Fraction of rangewide nests maintained on NBC lands = 1,605 nests on NBC/8,173 nests rangewide = 0.196, using data provided in the 2006 CDFG California Least Tern Breeding Survey.*

*Nesting Threshold for the Least Tern = NP x R x NBCF = 5000 pairs x 1.143 nests/pair x 0.196 = 1,120 nests.*

During consultation with the U.S. Fish and Wildlife Service (USFWS) in late 2009, this criterion was eliminated from consideration and replaced with different criterion (Section 2.3.5). The USFWS felt that the criterion was too complicated, and that a nesting threshold would not be scientifically defendable.

#### 2.1.3.7 Creating More Than or Less than 22 Concurrent Buffered and Marked Avoidance Areas for Western Snowy Plovers

Currently, the Navy buffers and marks avoidance areas around each western snowy plover nest that establishes on SSTC. The Navy considered caps on the number of concurrent western snowy plover nests buffered at SSTC, as it was concerned that an increase in western snowy plover nesting population would adversely affect training.

The Navy considered creating an avoidance cap of more than 22 concurrent western snowy plover nests, but found that that approach would render training lane(s) unusable. Twenty-two concurrent nests would translate into approximately two concurrent nests in each viable lane on SSTC (i.e., 14 training lanes excluding Lanes 1, 5, and 6, which have not historically had nests due to the shallow beach and hummocks). Two nests per lane could encumber 60 meters (m) of the 500 m beach lane width (12%). If the nests happen to be spaced closely together and/or close to the edge of the lane, the area in between the nests or between the nests and the edge of the lane may also become unusable for training (e.g., 40% of the training lane could be rendered unusable). Adding a third nest could render the entire lane unusable.

Because of the potential impacts of 22 concurrent nests on military training on SSTC, the Navy also considered buffering less than 22 concurrent nests. However, the Navy believed that 22 nests would best support USFWS's recovery criteria. The Western Snowy Plover Recovery Plan provides a "management potential" for number of breeding birds broken down by location. The management potential for the action area is 95 breeding birds (including non-Navy Silver Strand State Beach [SSSB]). To meet the management potential, 48 pairs would need to be in the action area (including SSSB). NASNI supported at minimum 14 pairs in 2008, and SSSB supported 8 pairs. Assuming SSSB supports at least another 2 pairs and the Delta Beaches another 2 pairs, 22 pairs would be needed at SSTC to meet the recovery goals in the action area. This does not include Coronado Beach which could also contribute to recovery of the western snowy plover.

### 2.1.4 Proposed Action and Alternatives Considered

Three alternatives are analyzed in this EIS: (1) The No Action Alternative, (2) Alternative 1, and (3) Alternative 2. These alternatives are summarized below and discussed in detail in the following sections.

The No Action Alternative would continue baseline training activities. Approximately 3,926 activities are conducted. The Navy would also continue to operate under existing access restrictions. These include the restriction of training within beach lanes Blue 2, Orange 1, Orange 2, and Delta North and Delta South during the nesting season, except for designated beach crossing lanes. At SSTC-S, vehicle and foot traffic is not permitted in vernal pools. In addition, training is not permitted inside buffer zones that are established around all western snowy plover nests.

Alternative 1 would increase training tempo from baseline conditions, conduct existing routine training at additional locations within SSTC established training areas, introduce new platforms and equipment into training, and increase access and availability to existing beach and inland training areas. Training would be allowed in Blue 2, Orange 1, and/or Orange 2 during the nesting season if other similar lanes are occupied or otherwise unavailable for use, or if attributes of these lanes make them more suitable for training than other similar lanes. The Navy would restrict training from occurring in buffer zones surrounding up to 22 western snowy plover nests at one time, not all western snowy plover nests. Also, the Navy would conduct training involving foot traffic, but not vehicle traffic, in the vernal pools when conditions are determined to be dry.

Alternative 2 is identical to Alternative 1, except that the Navy would utilize all 7,000 yards of ocean beaches along SSTC-N and SSTC-S, and all bayside training beaches, except the Delta North and South nesting habitat (i.e., Alpha, Bravo, Charlie, Echo, Foxtrot, Golf, and Hotel) for continuous, year-round training. Similar to the No Action Alternative and Alternative 1, the Navy would continue to conduct existing management practices on these lanes, including, nest relocation, predator management and control, habitat modification, site preparation for maintenance, nest substrate enhancement, signage and education, recreational use restrictions, and rearing of collected eggs, injured and sick individuals. Delta North and Delta South would continue to be managed as a California least tern nesting habitat during the five to six month breeding season, and used for training during the non-nesting period. Monitoring of the California least tern and western snowy plover at SSTC-N oceanside beaches would be performed for effect and take associated with military training.

## 2.2 No Action Alternative: Baseline Training and Access Restrictions

The No Action Alternative would continue current training under baseline operational tempos. Access restrictions would remain unchanged. Details regarding the No Action Alternative are contained in the following subsections.

### 2.2.1 Baseline Training Tempo

Under the No Action Alternative, training activities would continue at baseline levels. The No Action Alternative is required by regulations of the Council on Environmental Quality; the evaluation of the No Action Alternative in this EIS provides a baseline for assessing environmental impacts of Alternative 1 and Alternative 2, as described in the following subsections. Baseline training activities conducted on SSTC are described below. Each military training activity described in this EIS meets a requirement that can be traced to requirements from the National Command Authority. The No Action Alternative's current baseline tempo of 3,926 activities—organized into basic categories by Navy Tactical Tasks (NTA).

Over the years, the tempo and types of training activities have fluctuated within SSTC because of changing environments, the introduction of new technologies, the dynamic nature of international events, advances in warfighting doctrine and procedures, and force structure changes. Such developments have influenced the frequency, duration, intensity, and location of required training. The factors influencing tempo and types of operations are fluid in nature, and will continue to cause year-to-year fluctuations in training activities at SSTC. Accordingly, operational data used throughout this EIS are a representative baseline for evaluating impacts that may result from the proposed training activities under the No Action Alternative.

The Navy established its baseline training tempo by considering available historical usage data at SSTC, specifically, from 2001 through 2007. It is important to note that, during this period, the U.S. military commenced operations in Afghanistan and Iraq. Many of the units that would normally be training at SSTC were deployed overseas. Additionally, the focus of individual and unit training temporarily shifted to inland (desert or mountainous) environments to prepare personnel for conditions they would encounter in combat operations overseas. As such, SSTC has experienced a temporary decrease in training usage and tempo during the period being evaluated (2001 through 2007). To establish baseline training tempos, the Navy evaluated available 2001 through 2007 training data, considering year-to-year fluctuations as well as the recent progressive decline in training tempo at SSTC. For each training activity, the Navy selected 2001-2007 data that were most reflective of the average historical training conditions over the past few decades. Training at SSTC is not only expected to return to normal baseline levels after the conclusion of military combat operations in Iraq and Afghanistan, but to increase beyond baseline levels to support organizational realignments and address new surge requirements.

With reference to the selection criteria identified in Section 2.1.2, the No Action Alternative satisfies Fleet training requirements; however, because the No Action Alternative does not propose increases in training activities it does not accommodate training associated with the changes discussed in Section 1.5. Also, the No Action Alternative does not introduce new platforms and equipment into the Fleet; nevertheless, it provides a valuable baseline against which to assess Alternative 1 and Alternative 2.

### 2.2.2 Description of Baseline SSTC Training

SSTC has a key role in providing training assets in support of Navy, Marine Corps, and Special Operations individual and unit/Fleet training activities. A wide range of military commands, using a variety of personnel, vessels, vehicles, equipment, and aircraft, train at SSTC in different ways to meet their military readiness requirements. General descriptions of vessels, vehicles, and aircraft used in training activities is provided in Appendix B. A brief description of training activities are listed in Table 2-1 which also presents an elaboration of tempos for baseline training, total number of days devoted to each activity and specific training location areas within SSTC. In practice, some training activities may be combined with others to create more comprehensive, integrated training. Each of the basic NTA categories listed encompasses defined activities that are listed following Section 2.2.2 in Table 2-1 and analyzed in this EIS by grouping components of each activity (aircraft operations, marine vessel use, underwater detonation, etc.). For purposes of later comparison, training tempos proposed under Alternatives 1 and 2 are also provided.

As discussed in Chapter 1, tactical training activities as a part of the FRTP cover the spectrum of tactical training levels. Table 2-1 is representative of activities which are typical of the type of training that is currently being conducted at SSTC. The majority of activities are individual or unit level training consisting of 2 to 60 persons. Select activities coordinate and integrate multi-warfare missions from multiple units and, thus, are larger in scale, complexity, intensity, and duration.

**Maneuver—Move Forces (NTA 1.1.2)**. Anchoring, towing, and mooring to a buoy are conducted by marine vessels within the Silver Strand Anchorages Area, which lay south of Zuniga Point and within the colored boat lanes as far south as the Orange 1 boat lane. During mooring activities, Rigid Hull Inflatable Boats (RHIBs) support personnel transfer and observation. This training may be done day or night.

**Mine Countermeasures (NTA 1.3.1)**. Mine Countermeasures (MCM) and surface training at SSTC consist of activities conducted by Explosive Ordnance Disposal (EOD), Naval Special Warfare (NSW), and Helicopter Sea Combat units and involve location, identification, neutralization, and management of floating or underwater ordnance.

Simulated (inert) water mines may be floating, mid-column, or bottom-laid on the oceanside waters of SSTC-S from the shore. The mines are located and assessed using diving or swimming teams arriving on inflatable boats or para-dropped into the water from aircraft, typically UH-60 helicopters. Flares or smoke grenades may be used to signal personnel. Navy-owned marine mammals housed at Naval Base Point Loma are also sometimes used to locate mines. The simulated mines are neutralized using a variety of charges and at a variety of depths. The locations, depth and tempo of these activities are presented in Table 2-2. After neutralization, the mines may be raised, towed to shore, and beached. Water activities may also include the use of Autonomous Underwater Vehicles (AUVs) that hover over the ocean bottom and explore the area, photographing and collecting hydrographic information.

**Maritime Interdiction (NTA 1.4.6)**. Maritime Interdiction training at SSTC consists of Visit, Board, Search, and Seizure unit training activities for afloat units within the waters defined by SSTC-N beach lanes. The activities involve the interception, hailing, and armed boarding and search of a vessel underway or at anchor, primarily using boats, but sometimes involve helicopter assistance.

**Amphibious Operations (NTA 1.5.4)**. Amphibious activities at SSTC are designed to prepare personnel for insertion/extraction on the beach and dealing with aggressor forces on the beach. Insertion may occur via boat, swimming, aircraft, or vehicles. Expeditionary Warfare Training Group Pacific (EWTGPAC), First Marine Expeditionary Force, Naval Beach Group and NSW conduct these training activities. Amphibious training occurs throughout SSTC.

Personnel learn to handle small inflatable craft, such as Combat Rubber Raiding Craft (CRRCs) and Inflatable Boats Small (IBSs), including navigation to and from the shore, passage through surf conditions, and landing on the beach.

Personnel learn to tow the craft and launch them from larger Landing Craft Utility (LCUs) offshore. Preparation for landing may include hydrographic reconnaissance of bottom terrain and clearing of obstacles, as well as observation of surf rhythms. Once on the beach, personnel also train on dealing with aggressor forces, which may include the use of pyrotechnics and blanks to simulate attacks. Training also includes setting up a Craft Landing Zone for Landing Crafts, Air Cushioned (LCACs), or hovercrafts, to land on the beach.

The LCAC operates in waters regardless of depth, underwater obstacles, shallows or adverse tides. It can proceed inland on its air cushion, clearing obstacles up to four feet, regardless of terrain or topography, including mud flats, sand dunes, ditches, marshlands, riverbanks, wet snow, or slippery and icy shorelines.

Amphibious raids that can incorporate multiple amphibious activities are conducted at SSTC-S. Airborne raids can include insertion of personnel from helicopters hovering or landing at a designated inland drop zone in northern part of SSTC-S. Waterborne raids include beaching of inflatable craft, landing craft, and hovercraft. The Amphibious Assault Vehicle (AAV) is used in these waterborne raids and is an armored amphibious vehicle capable of seamlessly transporting Marines from Naval ships located beyond the visual horizon to inland objectives.

Surface raids include heavy tracked and light-wheeled vehicles offloaded from landing craft onto the beach. Activities may also include reconnaissance and response to mock enemy personnel on the beach.

**Naval Special Warfare (NTA 1.5.6)**. Training conducted under this NTA develops combat-ready NSW units, including Sea, Air, and Land (SEAL) teams, for clandestine Over-the-Beach (OTB) and amphibious assaults. Activities are conducted on both the bayside and oceanside of SSTC. NSW training on specialized, individual mission skills and physical fitness training (as opposed to Unit-level training) are categorized under NTAs 4.9.1 and 4.9.4, respectively.

During OTB training, personnel approach a beach lane from the water in CRRCs. The team waits for an advance swimmer to signal the area is safe for landing. The team portages (carries their CRRC) to the other side of SSTC isthmus and continues the drill while being prepared for any threat or situation. Activities may include concealing small boats on the beach by covering them with sand or carrying them to another beach, where the group reenters the water. Alternatively, the team may be inserted in front of a beach jetty and instructed to portage their inflatable boats over the jetty as a team. Personnel may also proceed inland and perform stalking activities where they conceal themselves with vegetation and move and hide through vegetation. Often, hydrographic reconnaissance is included in this training. Amphibious assaults consist of amphibious landings and may include setting up multiple observation posts on the beach. Mock enemy personnel may be used in the activities to simulate attacks. Other activities include testing of vehicles and practicing vehicle patrolling on the beach. Breacher training is also conducted at SSTC-S on temporary doors and frames erected in or near the existing bunkers. Training on manual (e.g., sledgehammers), gas compression, and shotgun breaching techniques are performed on these temporary doors.

**Tactical Reconnaissance and Surveillance (NTA 2.2.3)**. This activity consists of Helicopter Rope Suspension Training (HRST)/Cast and Recovery Operation, performed by EOD and NSW units, and the use of SEAL Delivery Vehicle/Advanced SEAL Delivery System (SDV/ASDS) by SDV Teams. SDV/ASDS activities are composed of multiple individual activities, including navigation runs, hydrographic reconnaissance, OTB, and underwater detonation training. SEAL Delivery Systems were designed to reduce the risk to Navy Special Warfare forces (SEALs) when required to transit from a submarine to shore. The submersible is capable of operating independently or with other existing Navy ships and allows NSW teams to arrive near their target with only a short swim or immersion.

During HRST training, personnel are attached to ropes, or slide on fast ropes, or jump into water from helicopters. Some activities require personnel to swim to shore from the drop site, and others extract the personnel from the site. HRST is the collective term for rappel, fast rope, and Special Insertion/Extraction activities. HRST systems were developed as a means to insert or extract ground force personnel (primarily reconnaissance teams) by helicopter into or from situations where aircraft landings are impractical due to terrain or tactical situations. Cast and Recovery activities deal with the delivery and retrieval of CRRC into open water from a helicopter.

SDV/ASDS activities are composed of multiple individual activities, including navigation runs, hydrographic reconnaissance, OTB, combat swimmer, and underwater detonation training. Activities may culminate in Full Mission Profiles that are graded to certify personnel for deployment.

**Construct, Maintain, and Operate Logistics Over-the-Shore (NTA 4.5.6)**. Naval Beach Group units and EWTGPAC provide support during amphibious assaults to load and unload ships with equipment and supplies without the benefit of deep draft-capable, fixed port facilities in friendly or undefended territory. Essentially, these units create and operate facilities ashore where no facilities exist, and bring equipment and supplies from ships at sea to ashore staging points for use by forces ashore. They require shore support activities including the use of heavy equipment.

Under this NTA, there are five basic Cargo Offloading and Transfer activities used. These include a roll-on roll-off discharge facility, floating causeway insertion/retraction, barge ferry insertion/extraction of causeway piers, elevated causeways (ELCAS), and Maritime Prepositioning Ships (MPS) offload. The ELCAS provides an interface between lighterage (small craft designed to transport cargo or personnel from ship to shore) and shore by bridging the surf zone. It is assembled by joining standard causeway sections together and can be assembled in 10 days.

Additional logistical training includes transfer of equipment from amphibious ships to LCUs, deployment of the Offshore Petroleum Discharge System (OPDS) and Amphibious Bulk Liquid Transfer System (ABLTS), which transfer petroleum and water products to the shore (only water is used during training), and Landing Craft, Utility and Landing Craft, Mechanized (LCU/LCM) towing and beaching. OPDS provides a semipermanent, all-weather facility for bulk transfer of refined bulk petroleum (e.g., JP5 and JP8) directly from an offshore tanker to a Beach Interface Unit (BIU) located immediately inland from the high watermark. Major OPDS components are: the OPDS tanker with booster pumps and spread mooring winches, a recoverable Single Anchor Leg Moor (SALM) to accommodate four tankers up to 70,000 dead weight tons, ship to SALM hose lines, up to four miles of six-inch (internal diameter) conduit for pumping liquids to the beach (only one mile is used during training), and two Beach Termination Units (BTUs) to interface with the shoreside systems. The ABLTS Hosereel system provides the capability to deliver fuel and/or water from ship to shore. System includes 10,000 feet of six-inch buoyant hose for fuel, and 10,000 feet of four-inch buoyant hose for water.

Beach party command posts may be established on the beach to support and direct onshore logistical activities. Beach camps and Reverse Osmosis Water Purification Units (ROWPUs) may be set up to support and supply personnel operating on the beach over multiple days. The ROWPU provides potable water from any water source. The ROWPU produces potable water from a variety of raw water sources such as wells, lakes, seas, lagoons, rivers, oceans and ice holes. The water is pumped from its raw source into the ROWPU module. Next, it is run through a multi-media filter where it undergoes ion exchange. It is then pumped through a cartridge filter which is usually spiral-wound cotton. This process clarifies the water of any particles larger than five micrometers and eliminates almost all turbidity.

**Mission Area (NTA 4.9.1)**. NSW conducts a comprehensive set of diving and ocean training classes, insertions, extractions, reconnaissance, information relay, Close Quarters Combat (CQC), and other training at SSTC. Combat-ready NSW units and physical fitness training are categorized under NTAs 1.5.6 and 4.9.4, respectively. NSW Mission Area Qualification Training is composed of the following general activity categories:

*Naval Special Warfare Diving and Beach Activities*. Numerous activities are performed to enhance NSW skills. Hydrographic Reconnaissance is conducted to survey underwater terrain conditions for amphibious landings. Reconnoitering of beaches and surf conditions are performed to find and clear underwater obstacles and to determine the feasibility of landing an amphibious force on a particular beach. Activities are also performed with Lung Automatic Rebreather (LAR) V-Closed Circuit Breathing Diving which recirculates exhaust air. Trainees also must be comfortable with open-circuit Self-Contained Underwater Breathing Apparatus (SCUBA) dive training to complete their training. Activities may include OTB activities (discussed under NTA 1.5.6).

*Naval Special Warfare Land Warfare*. This training provides students with combat skills in the foot patrol of SSTC beach lanes and inland areas while in formations. Inert weapons are carried to simulate combat realism. Trainees are required to react to various situations such as defensive measures to perceived threats.

*Naval Special Warfare Advanced Training*. This training provides classroom and practical training in special warfare. Personnel observe locations and record activity by photo images, sketching, or range estimation. Personnel learn to control Unmanned Aircraft System (UASs) for overhead flights for more observation. Similar activities entail the clandestine patrols of teams to assess risks of potential enemy forces. CQC / Close Quarters Defense activities train personnel with the skills to safely and efficiently move through a building. Activities may be performed in conjunction with OTB activities (discussed under NTA 1.5.6). Activities could also include insertion from helicopter or light wheeled vehicles to secure a building or area for a larger team. Classroom training may also be conducted in communications and special programs. Through a culmination of learned skills, classroom and experiential, students are trained for any possible situation. Squadron Integrated Training (SIT) brings team members, equipment, air assets, and EOD components of a squadron together for conducting a one-mission or multi-mission scenario. SIT incorporates many skills including reconnaissance, data collection and analysis, and urban movement.

**Physical Fitness Training (NTA 4.9.4)**. NSW and other units conduct a wide variety of physical training for individuals stationed on SSTC. Personnel must complete timed runs, marches with backpacks, boat paddling and portages, and ocean swims in a variety of temperatures, terrains, distances, and surf conditions to pass the training requirements. Occasionally, military working dogs also engage in physical conditioning activities. The obstacle course on Yellow 2 beaches are used to assist in physical conditioning.

**Industrial and Environmental Health Services (NTA 4.12.6)**. Navy Environmental and Preventive Medicine Unit Five provides consultation and recommendations in matters of preventive medicine and environmental health to commands afloat and ashore. They conduct environmental health site assessments to understand the potential health risks in operational environments. Training at SSTC is usually conducted as part of another training event and consists of establishing a small camp and interacting with other units. Students learn how to provide preventative medicine to field personnel. Part of their training may include learning to conduct and analyze air and soil samples in areas where operations occur.

**Protect Against Combat Area Hazards (NTA 6.1.1)**. MCM and surface activities at SSTC consist of training activities conducted by EOD units and involve location, identification, neutralization, and management of surface emplaced ordnance.

Simulated (inert) surface emplaced munitions may be placed or buried on the beach or inland throughout SSTC. The munitions are located using a variety of methods, including mounted and dismounted searching, probing techniques and metal detectors. Buried munitions may require hand tools and digging for excavation. Once exposed and identified, the simulated munitions may be transported offsite for neutralization. Training may include OTB activities where personnel are inserted into the water via boat or helicopter, clandestinely move towards shore and inland areas, perform land patrolling and reconnaissance activities, and may include reaction to simulated attacks from aggressor forces using pyrotechnics and blanks.

**Force Protection: Protect and Secure Area of Operations (NTA 6.3.1)**. These activities are conducted by Naval Coastal Warfare (NCW), Harbor Defense Command Units, and Mobile Inshore Undersea Warfare Units throughout SSTC and the San Diego Bay. Joint Exercises with personnel from EOD and Amphibious Construction Battalion can periodically occur as schedule and unit availability dictates. The activities consist of a field training event, conducting port and coastal waterborne force protection, harbor defense, seaward security, as well as military activities other than war. Manning can vary from 50 to 1,000 personnel depending on scope and participation of the activity. During field training, NCW campsites include erection of tents (communication gear, conference room, operations center, operational galley, field mess, and 14-person berthing tents) and generators. When NCW boat units participate, up to 30 small armed patrol boats (32-foot) are used to conduct simulated patrol missions on San Diego Bay, in the vicinity of NAB Coronado. The field activity lasts from 4 to 14 days.

**Combat Terrorism (NTA 6.3.3)**. Small attacks are conducted on boats within SSTC anchorages and SSTC-N boat lanes. Afloat Training Group coordinates the training event, providing observers and assisting in providing small attack boat services. For this activity, one or two small boats or personal watercraft conduct attack activities on units afloat.

**Table 2-1: Baseline and Proposed Tempos for SSTC Training Activities**

| # | Activity | Description | Location | Days to Complete Each Event | Events per Year | |
|---|---|---|---|---|---|---|
| | | | | | No Action | Alternatives 1&2 |
| **NTA 1.1.2 Conduct Maneuver-Move Forces** | | | | | | |
| 1 | Anchoring | Surface ship or small craft crew develop proficiency in precision anchoring at designated anchorage. | Anchorages* | 1 | 72 | 72 |
| 2 | Towing | Surface ship or small craft crew develop proficiency in towing and being towed exercise. | SSTC-N Boat Lanes 1-10 | 1 | 30 | 30 |
| 3 | Moor to Buoy | Surface ship or small craft crew develop proficiency in mooring to a buoy. | SSTC-N Boat Lanes 1-10 | 1 | 36 | 36 |
| **NTA 1.3.1 Perform MCM** | | | | | | |
| 4 | Parachuting | Personnel parachute from aircraft into water or land drop zones. Flares or smoke grenades may be used to signal personnel. | All SSTC Boat Lanes 1-14<br>SSTC-S Inland Echo | 1 | 216 | 228 |
| 5 | MCM | Activities are performed from a small craft to locate and identify suspected ordnance either at mid-column or on the sea floor at a water depth of ≤ 72 feet. A detachment dives to locate the suspected ordnance. Once located, a single explosive charge (10-20 pounds NEW) is placed next to the ordnance to neutralize it. The neutralized mine is then raised, towed to shore, and beached. | All SSTC Boat and Beach<br>Lanes 1-14 | 1 | 32 | 58 |
| 6 | Floating Mine | Personnel are inserted into the ocean via helicopter or 24-foot vessel, swim to the floating mine in water depths of less than 72 feet, and place a single explosive countercharge (less than 5 pounds NEW) on the mine. The team retreats a safe distance prior to command detonation of a single countercharge. | All SSTC Boat Lanes 1-14 | 1 | 25 | 53 |

*Locations listed are for No Action Alternative only and will be expanded under Alternative 1 and 2. The expanded locations are detailed in Table 2-3. Appendix C provides activity details regarding marine vessels, personnel, ordnance, and vehicles.

**Table 2-1: Baseline and Proposed Tempos for SSTC Training Activities (Continued)**

| # | Activity | Description | Location | Days to Complete Each Event | Events per Year: No Action | Events per Year: Alternatives 1&2 |
|---|---|---|---|---|---|---|
| 7 | Dive Platoon | Divers are inserted into the ocean via helicopter or 24-foot vessel, dive to depths of 30-72 feet and detonate sequential charges on an inert mine shape placed on the bottom with 3.5 pounds NEW. | All SSTC Boat Lanes 1-14 | 1 | 8 | 8 |
| 8 | Very Shallow Water (VSW) Operator Course | Personnel gain proficiency in the use of new equipment during diving activities. One to two RHIBs transport personnel to the site to conduct the training course. | All SSTC Boat Lanes 1-14 | 8 | 4 | 6 |
| 9 | VSW MCM | Locating, identifying, and neutralizing mines (placing explosives on mines for the purposes of destroying them) placed either mid-column or on the sea floor at a water depth of ≤ 24 feet (10-20 pounds NEW). Use of explosives will occur during approximately 40% of training activities and will occur in the SSTC Boat Lanes only. Personnel are transported to a location in one to two RHIBs and place transponders into the water. The transponders hover over the bottom to provide divers with shallow-water navigation instruction. | All SSTC Boat Lanes 1-14 Alpha, Bravo, Charlie, Echo | 1 | 120 | 156 |
| 10 | Autonomous Underwater Vehicle (AUV)/ Unmanned Underwater Vehicle (UUV) | Training on use of AUVs and UUVs. One to two RHIBs are used to transport personnel to a site. Two transponders are placed in the water, with an AUV between them. AUVs and UUVs explore the area, photograph, and collect hydrographic information. After analysis is complete, appropriate Navy marine mammals are dispatched to localize and mark potential objects, followed by divers who clear the area of identified hazards. Approximately 3% of activities involve placing a single 10-15 pound NEW charge in water depths from 10 to 72 feet on the oceanside, on the bottom or up to 20 feet from the surface, to neutralize the simulated mine. Use of explosives will only occur in the SSTC Boat Lanes. | All SSTC Boat Lanes 1-14 Breakers Beach Delta I, II, and Delta North | 1 | 120 | 156 |

**Table 2-1: Baseline and Proposed Tempos for SSTC Training Activities (Continued)**

| # | ACTIVITY | DESCRIPTION | LOCATION | DAYS TO COMPLETE EACH EVENT | EVENTS PER YEAR | |
|---|---|---|---|---|---|---|
| | | | | | NO ACTION | ALTERNATIVES 1&2 |
| 11 | MK8 Marine Mammal/Marine Mammal Systems (MMS) | SCUBA assisted personnel and Navy marine mammals work together to detect specified underwater objects. Personnel work with the help of marine mammals to detect underwater objects. Approximately 10% of training involves the setting of a 13- or 29-pound NEW charge to detonate the objects. Sequential detonations operate at water depths of 10 to 72 feet and are bottom laid. Single charges are laid within water depths of 24 to 72 feet, 20 feet from the surface or below. Use of explosives will only occur in the SSTC oceanside Boat Lanes 1-14. | All SSTC Boat Lanes 1-14 Breakers Beach | 1 | 175 | 208 |
| 12 | Mine Neutralization | Personnel are inserted via helicopter or vessel for underwater demolition training consists of eight sequential charges placed on the sea floor using 3.5-pound NEW explosive charges on various inert mine shapes in water depths of 30 to 72 feet to maintain qualifications. | All SSTC Boat Lanes 1-14 | 1 | 4 | 4 |
| **NTA 1.4.6 Conduct Maritime Interdiction** | | | | | | |
| 13 | Visit, Board, Search, and Seizure | Activity involves multi-national training consisting of interception, hailing, and armed boarding and search of a vessel underway or at anchor from another vessel. | SSTC-N Boat Lanes 1-10 Naval Base San Diego | 1 | 30 | 42 |
| **NTA 1.5.4 Conduct Amphibious Operations** | | | | | | |
| 14 | Small Boat Handling | Consists of maneuvering a CRRC in a confined space (individual and unit training). Consists of students conducting various approaches to a pier. | Foxtrot | 1 | 94 | 94 |
| 15 | Swimmer Conditioning – Bay and Ocean with fins | Involves timed San Diego Bay and ocean swims with fins in a variety of conditions where groups of students participate in training. Swim course prepares students with progressive difficulty and varied conditioning swims. | SSTC-N Boat Lanes 1-10 Foxtrot | 1 | 189 | 189 |

**Table 2-1: Baseline and Proposed Tempos for SSTC Training Activities (Continued)**

| # | Activity | Description | Location | Days to Complete Each Event | Events per Year: No Action | Events per Year: Alternatives 1&2 |
|---|---|---|---|---|---|---|
| 16 | Basic Reconnaissance Course Final Mission | Insertion of persons in small groups offshore by dropping personnel and small inflatable boats via helicopter (helocasting). Each group proceeds to shore in the boats, beaches their boats, and proceeds inland. Training scenarios may include shore observation prior to landing, and clandestine movements from the surf to inshore locations. | All SSTC-S Boat and Beach Lanes 11-14 SSTC-S Inland Waters outside boat lanes | 1 | 8 | 8 |
| 17 | Obstacle Course | Personnel navigate the obstacle course that is established on the Yellow 2 Beach on SSTC-N. The obstacle course is often combined with a run on SSTC-N oceanside beaches. | SSTC-N Beach Lane-Yellow 2 | 1 | 138 | 142 |
| 18 | Hydrographic Reconnaissance | Students swim and survey underwater terrain conditions from small watercraft or near-shore insertion on reconnaissance missions to find underwater obstacles and identify conditions for a beaching party. The training may also include the clearing of obstacles. Swimmers use weights and soundings to measure depth and the activity occasionally includes foot patrols on the beach. | All SSTC Boat Lanes 1-14 Breakers Beach Delta III | 1 | 40 | 44 |
| 19 | Surf Observations (SUROBS) | Groups of students clandestinely patrol to a predetermined position on the beach to observe, monitor, and analyze the various surf rhythms and conditions. | All SSTC-N Beach Lanes* | 1 | 116 | 116 |
| 20 | CRRC/IBS Surf Passage/ Boat Team Organization and Function | Groups of students show their competence in navigation of CRRCs and inflatable boat small from the beach out through the surf zone to a predetermined point, simulate evacuation and recovery, flip and right, and return to shore through the surf. Boat teams may launch from an amphibious ship up to 50 miles offshore. This is designed to develop offshore, over-the-horizon navigation skills. Students may also perform conditioned swims. | SSTC-N Boat Lanes 1-10 Breakers Beach Foxtrot | 1 | 72 | 72 |
| 21 | CRRC Towing and High Speed Maneuver | Preparation of CRRCs for towing by another craft and also towing another craft. Students in boats maneuver vessels at high speeds in formations with other boats. | Echo, Foxtrot, Golf | 1 | 8 | 8 |

*Locations listed are for No Action Alternative only and will be expanded under Alternative 1 and 2. The expanded locations are detailed in Table 2-3. Appendix C provides activity details regarding marine vessels, personnel, ordnance, and vehicles.

### Table 2-1: Baseline and Proposed Tempos for SSTC Training Activities (Continued)

| # | Activity | Description | Location | Days to Complete Each Event | Events per Year | |
|---|---|---|---|---|---|---|
| | | | | | No Action | Alternatives 1&2 |
| 22 | CRRC / LCU Launch and Recover Bay and Ocean | Students launch CRRCs from a LCU into the water from SSTC-N piers or SSTC beach. The CRRCs are then recovered by personnel. | All SSTC Boat and Beach Lanes 1-14 Delta I, II, Echo | 1 | 24 | 24 |
| 23 | CRRC Navigation, Bay and Ocean Runs | Demonstration of competence in piloting and navigation of CRRCs in the San Diego Bay and ocean. | All SSTC Boat and Beach Lanes 1-14 Echo, Foxtrot, Golf | 1 | 26 | 26 |
| 24 | Amphibious Raid Course Final Mission | A maximum of 110-130 students train simultaneously. Students embark from SSTC-N piers and transit to NASNI via landing craft that launch inflatable boats that proceed to the NASNI beaches. | Breakers Beach, Echo, Foxtrot, Golf, NASNI, and San Diego Bay waters around NASNI | 1 | 24 | 24 |
| 25 | Amphibious Raid | May include insertion of up to 150 personnel in various mission scenarios. Personnel may be inserted onto shore via helicopter hovering or landing at a designated inland drop zone in northern part of SSTC-S; AAVs; and/or CRRCs launched from an amphibious ship offshore, and landing craft. When on shore, personnel activities may include reconnaissance for intelligence gathering, preparation for dive activities, manual and machine excavations, and use of small arms (blanks) and pyrotechnics. | SSTC-S Boat Lanes 11-14 SSTC-S Inland | 3 | 2 | 18 |
| 26 | Direct Action (DA) | Similar to Amphibious Raid, includes insertion of up to 90 personnel onto the shore via helicopter, CRRCs, and/or light wheeled vehicles. Reconnaissance, dive activities, small arms (blanks), pyrotechnics, simunitions, boat breaching, snipers (w/bullet traps), and beach patrols are all part of the complete activity. Personnel may proceed inland and perform live fire of small arms inside the bunkers and breaching outside the bunkers. | SSTC-S Boat Lanes 11-14 SSTC-S Inland | 3 | 2 | 18 |
| 27 | Craft Landing Zone (CLZ) | CLZ Team surveys and marks beach for one LCAC ingress/egress. Provides personnel to safely guide LCAC to designated shore landing area. | All SSTC Boat and Beach Lanes 1-14 Breakers Beach | 1 | 4 | 4 |

**Table 2-1: Baseline and Proposed Tempos for SSTC Training Activities (Continued)**

| # | Activity | Description | Location | Days to Complete Each Event | Events per Year: No Action | Events per Year: Alternatives 1&2 |
|---|---|---|---|---|---|---|
| **NTA 1.5.6 Conduct NSW** | | | | | | |
| 28 | Swimmer/CRRC OTB Insertions/ Extraction with Pyrotechnics/ Blanks | Raiding parties launch approximately 1,000 yards off beaches allowing for swimmers to swim ahead and scout the beach and then allow CRRCs to proceed to the beach. May include patrols on the beach and inland, burying CRRCs in vegetation to conceal them, and use of small arms, blanks, and pyrotechnics to simulate attacks. | All SSTC Boat and Beach Lanes 1-14 SSTC-Inland | 4 | 52 | 86 |
| 29 | OTB Stalk | Personnel swim to the beach from CRRCs that were helo-cast into the water. SEAL team personnel then clandestinely move up the beach to scout an area. | All SSTC-S Boat and Beach Lanes 11-14 SSTC-Inland | 1 | 16 | 24 |
| 30 | Immediate Action Drills | Personnel swim to the beach from CRRCs that were helo-cast into the water. Mock enemies fire blank ammunition and use pyrotechnics; the raiding party takes evasive action in response. | All SSTC-S Boat and Beach Lanes 11-14 SSTC-S Inland | 1 | 8 | 12 |
| 31 | Breacher Training | Training designed to provide experience knocking down doors to breach a building or structure. Breacher training provides training for entering a building or structure using manual, compressed gas, torch, or shotgun. Conducted at SSTC-S inside the fence line, frequently temporary doors and frames are constructed to simulate exterior and interior door breaching. | SSTC-S Inland (Bunker 98, Interior of Bunker 99)* | 1-5 | 9 | 20 |
| 32 | Amphibious Warfare | Comprehensive training that includes insertion onto and extraction from the beach, noncombatant evacuation, and hydrographic reconnaissance. | SSTC-N Boat and Beach Lanes 1-8 SSTC-S Boat and Beach Lanes 11-14 Bravo, Delta I, II, III, Echo, Fox, Golf, Hotel | 1 | 50 | 84 |

*Locations listed are for No Action Alternative only and will be expanded under Alternative 1 and 2. The expanded locations are detailed in Table 2-3. Appendix C provides activity details regarding marine vessels, personnel, ordnance, and vehicles.

**Table 2-1: Baseline and Proposed Tempos for SSTC Training Activities (Continued)**

| # | Activity | Description | Location | Days to Complete Each Event | Events per Year | |
|---|---|---|---|---|---|---|
| | | | | | No Action | Alternatives 1&2 |
| 33 | Mobility Primary Mission Area | Personnel are inserted onto the beach via RHIBs or Mark V SOC. Provides hands on training on gear set up configurations, reconnaissance of the beach, and develops an observation base. | SSTC-N Boat and Beach Lanes 1-8 SSTC-S Boat and Beach Lanes 11-14 Bravo, Delta I, II, III, Echo, Fox, Golf, Hotel | 1 | 200 | 200 |
| 34 | Escape and Evasion | This activity is designed to enhance boat operators' skills in escape and evasion techniques. The activity consists of simulated attacks on special operations crafts. Two RHIBs and two-Mark V SOC are used for the training. | SSTC-N Boat and Beach Lanes 1-8 Bravo | 1 | 20 | 84 |
| **NTA 2.2.3 Perform Tactical Reconnaissance and Surveillance** | | | | | | |
| 35 | Helicopter Rope Suspension Training/Cast & Recovery | Insertion and/or extraction of ground force personnel (primarily reconnaissance teams) by helicopter into or from rough terrain or urban areas. Cast and recovery of inflatable boats and personnel into the water, rappelling and fastroping over land and water. Some activities require personnel to swim to shore from the drop site and others extract the personnel from the site. | All SSTC Boat and Beach Lanes 1-14 SSTC-S Inland Alpha, Bravo, Charlie, Delta I, II, III, Echo, Hotel, Foxtrot | 1 | 124 | 154 |
| 36 | Rappel & Fast Rope Training | Rappelling from the rappel tower north of the obstacle course that is located on Yellow Beach. | SSTC-N Beach Lane 1-Yellow | 1 | 6 | 11 |
| 37 | SEAL Delivery Vehicle (SDV)/ Advanced SEAL Delivery System (ASDS) Certification to Deploy | Designed to certify SDV Team operators for deployment, activities include DA, reconnaissance, and/or counter-terrorism activities. Training may include navigation runs into and out of the San Diego Bay, hydrographic reconnaissance, OTB training, combat swimmer, and underwater detonation training (a single timed charge of 10 pound or less NEW in water depths of 24 feet or less placed from mid-water column to the seafloor), that may be conducted in coordination with other training activities. Use of explosives will only occur in the SSTC oceanside Boat Lanes 1-14. | All SSTC-N Boat and Beach Lanes 1-10 Delta III, Echo, Foxtrot, Golf, Hotel | 14 | 14 | 40 |

**Table 2-1: Baseline and Proposed Tempos for SSTC Training Activities (Continued)**

| # | Activity | Description | Location | Days to Complete Each Event | Events per Year | |
|---|---|---|---|---|---|---|
| | | | | | No Action | Alternatives 1&2 |
| **NTA 4.5.6 Construct, Maintain, and Operate Logistics Over-the-Shore** | | | | | | |
| 38 | Offshore Petroleum Discharge System (OPDS) | Consists of five training subcomponents including the Beach Termination Unit (BTU), Operation Utility Boat (OUB) Technicians, OUB Coxswain, Dive Boat Operation Technician, and Single Anchor Leg Moor (SALM) Training. This activity trains personnel in the transfer of petroleum (though only sea water is used during training) from ship to shore. From approximately 1 mile offshore, the OUB technicians and underwater construction team divers roll out conduit from a ship offshore, deploy the SALM mooring which sinks to and settles on the ocean floor, and use anchors at various points along the conduit to secure it to the seafloor. The conduit terminates at the shore location of the BTU manifold. | All SSTC-N Boat and Beach Lanes 1-10 Bravo<br>Waters outside of boat lanes | 25 | 6 | 6 |
| 39 | Amphibious Bulk Liquid Transfer System (ABLTS) | Deployment of the ABLTS. Using warping tugs to deploy a 10,000-foot-long floating liquid (seawater) transfer conduit from a commercial tanker to a Beach Interface Unit (BIU) onshore. | All SSTC-N Boat and Beach Lanes 1-10 Bravo | 15 | 4 | 5 |
| 40 | Barge Ferry Causeway/ Coxswain Training | Navigation course for the barge ferry consisting of navigation, beaching and retracting drills, and surf handling. Beaching drills include connecting causeway sections. A barge ferry consists of one powered causeway section connected to one or more nonpowered sections. | All SSTC-N Boat and Beach Lanes 1-10 Bravo | 1- 3 | 34 | 54 |
| 41 | Causeway Pier Insertion and Retraction | Bulldozers dig notches in the beach in order to make an anchor point for the floating pier which is beached using a barge ferry. Pier sections are added end-to-end until the causeway extends out over the surf zone. Training is conducted on both older causeway systems and on the newer, improved Navy lighterage system (INLS). | SSTC-N Boat and Beach Lanes 3-10 Bravo | 2 -5 | 9 | 10 |

**Table 2-1: Baseline and Proposed Tempos for SSTC Training Activities (Continued)**

| # | Activity | Description | Location | Days to Complete each Event | Events per Year | |
|---|---|---|---|---|---|---|
| | | | | | No Action | Alternatives 1&2 |
| 42 | ELCAS | A pier is constructed off of the beach. The pier is designed to allow for offload of materials and equipment from supply ships. Piles are driven into the sand with an impact hammer. Causeway platforms are then hoisted and secured onto the piles with hydraulic jacks and cranes. The ELCAS pier, including associated piles, is removed at the conclusion of training. | All SSTC-N Boat and Beach Lanes 1-10 Designated Bravo Beach training lane | 8 -10 | 2 | 4 |
| 43 | Establish Beach Party Command Post | Establishment of a command post. Training includes using bulldozers and backhoes to dig ravines and perimeter trenches and adding camouflaging netting to provide defensive security. Latrines are setup and mobile generators are brought in for power. An observation post is set up. Mock aggressors may be dispatched to simulate an attack. | All SSTC-N Boat and Beach Lanes 1-10 | 4 | 16 | 16 |
| 44 | Sterngate Marriage to Amphibious Ship/LCU; Embark/Debark Welldeck 1 | An amphibious ship is linked with an LCU. The LCU drops its bow ramp and approaches an amphibious vessel in order to transfer personnel, rolling stock, and supplies without embarking the vessel. LCU Embark/Debark requires the amphibious ship to lower down by releasing ballast water in order to embark the LCU in the welldeck or debark from the welldeck. | All SSTC-N Boat and Beach Lanes 1-10 Waters outside boat lanes | 1 | 40 | 40 |
| 45 | LCU/ LCM Beaching | Personnel practice navigating the surf and beaching LCUs and LCMs and rescuing beached watercraft. Bulldozers may also assist pushing the craft off the beach. | All SSTC Boat and Beach Lanes 1-14 Designated Bravo Beach training lane | 1 | 60 | 60 |
| 46 | LCU/LCM Towing/Being Towed | Training with LCUs and LCMs allow pilots to practice rescuing beached water craft via towing. Bulldozers may also assist pushing craft off the beach. | All SSTC-N Boat and Beach Lanes 1-10 Designated Bravo Beach training lane | 1 | 60 | 60 |
| 47 | Communications Training | Personnel train in setting up a radio and practicing communications procedures. | All SSTC-N Beach Lanes SSTC S Inland Bravo, Delta I, II, III | 2 | 1 | 2 |

**Table 2-1: Baseline and Proposed Tempos for SSTC Training Activities (Continued)**

| # | Activity | Description | Location | Days to Complete Each Event | Events per Year: No Action | Events per Year: Alternatives 1&2 |
|---|---|---|---|---|---|---|
| 48 | Field Training with a Beach Camp | Provides training in the establishment and disestablishment of a self-sustaining camp of up to 850 persons. The camp includes erection of tents (operational galley, field mess, shower and latrine units, and berthing), generators and boiling units, light panels, refrigeration units, laundry units, and water purification units. Mock aggressor may also be used to attack the campsite. | All SSTC-N Beach Lanes* | 14 | 1 | 2 |
| 49 | Maritime Prepositioning Ships (MPS) Offload | Materials and supplies are offloaded from an amphibious ship offshore onto a RRDF, a causeway platform. | All SSTC-N Boat and Beach Lanes 1-10* | 5 | 1 | 2 |
| 50 | Reverse Osmosis Water Purification Unit (ROWPU) | ROWPU is set up on the beach and extracts seawater and converts it into potable water via reverse osmosis and chlorination. The unit includes a generator with berms constructed around it to provide support. | All SSTC-N Beach Lanes | 4 | 4 | 4 |
| 51 | Roll-On Roll-Off Discharge Facility (RRDF) | Causeway platforms are set up off the beach and supplies are transferred from a ship to the beach. The causeway sections are inserted onto the beach by ferry barges which are piloted by personnel performing concurrent training. | All SSTC-N Boat and Beach Lanes 1-10 Foxtrot* | 5 | 1 | 2 |
| 52 | MPFUB Operator Course | MPFUB Operator Course includes pier approaches, surf salvage, beaching and retracting on the oceanside, offshore maneuvering, towing, and offshore navigating. | All SSTC-N Boat and Beach Lanes 1-10 Designated Bravo Beach Training Lane, Delta I, II, III | 9 | 2 | 2 |
| 53 | LARC V Operator Training | Training with LARC Vs allow pilots to practice start-up/shut-down procedures, maintenance, towing, anchoring, maneuvering on land and at sea, and surf negotiation. | SSTC-N Boat and Beach Lanes 1, 2, 5-8 Delta I, II, III | 6 | 1 | 1 |

*Locations listed are for No Action Alternative only and will be expanded under Alternative 1 and 2. The expanded locations are detailed in Table 2-3. Appendix C provides activity details regarding marine vessels, personnel, ordnance, and vehicles.

**Table 2-1: Baseline and Proposed Tempos for SSTC Training Activities (Continued)**

| # | Activity | Description | Location | Days to Complete Each Event | Events per Year: No Action | Events per Year: Alternatives 1&2 |
|---|---|---|---|---|---|---|
| **NTA 4.9.1 Conduct Mission Area Training** | | | | | | |
| | **NSW Diving and Beach Operations** | | | | | |
| 54 | Lung Automatic Rebreather (LAR) V Closed Circuit Breathing Diving | Training on usage of the LAR V, and underwater breathing device that recirculates exhaust air. This allows the diver to stay submerged and remain undetected. | Alpha, Bravo, Charlie, Delta III, Echo, Fox, Golf, Hotel, Glorietta Bay, San Diego Bay, Naval Base San Diego. | 1 | 126 | 126 |
| 55 | Open Circuit Breathing Diving | Personnel train on the use of SCUBA in the most varied underwater terrain. | All SSTC-N Boat and Beach Lanes 1-10 Alpha, Bravo, Charlie, Delta I, II, III, Echo, Fox, Golf, Hotel Breakers Beach* | 1 | 12 | 12 |
| 56 | OTB Field Training | Personnel paddle to the beach undetected while an advance swimmer swims ahead to observe for enemy movement and signal the landing party to come ashore. The team patrols and remains prepared for unexpected situations. Afterwards, they discretely reenter the water and paddle back offshore. Held over a 5-day/night period. | All SSTC Boat and Beach Lanes 1-14 Delta I, Echo Breakers Beach | 5 | 36 | 36 |
| 57 | Rock Portage | Students gain proficiency in navigating around and portaging over a rock jetty. Following the small surf passage, multiple teams must carry their raft over the rock jetty formations for a realistic training experience. | All SSTC-N Boat and Beach Lanes 1-10 Breakers Beach and Zuniga Jetty Coronado Rock Jetty* | 4 | 18 | 20 |
| | **NSW Land Warfare** | | | | | |
| 58 | Land Patrolling | Students patrol the beach in a single file line and communicate with each other nonverbally through hand signals and gestures. Inert weapons are carried to simulate combat realism. | All SSTC Beach Lanes 1-14 SSTC Inland Alpha | 1 | 18 | 18 |

*Locations listed are for No Action Alternative only and will be expanded under Alternative 1 and 2. The expanded locations are detailed in Table 2-3. Appendix C provides activity details regarding marine vessels, personnel, ordnance, and vehicles.

**Table 2-1: Baseline and Proposed Tempos for SSTC Training Activities (Continued)**

| # | Activity | Description | Location | Days to Complete Each Event | Events per Year | |
|---|---|---|---|---|---|---|
| | | | | | No Action | Alternatives 1&2 |
| 59 | Immediate Action Drills | Small groups of trainees are required to react to various situations such as reconnaissance, or by initiating offensive and defensive measures to perceived threats during land patrolling. Personnel may use blanks, simunitions, and pyrotechnics to initiate action. | All SSTC Beach Lanes 1-14<br>SSTC Inland | 1 | 5 | 6 |
| | **NSW Advanced Training** | | | | | |
| 60 | OTB Insertion/Photo Reconnaissance | Personnel swim to shore, breach the perimeter beach fence, and perform photo reconnaissance on the interior of SSTC-S. | All SSTC-S Boat and Beach<br>Lanes 11-14<br>SSTC Inland<br>Beach areas outside SSTC-S fenceline | 1 | 31 | 31 |
| 61 | Photo Image Capture | Photographing, downloading, and sending photographic images to command centers. | SSTC-S Inland | 14 | 3 | 4 |
| 62 | Field Skills (Observation Drills, Sketching, Range Estimation) | Timed drills in observing, sketching, and estimating range to targets. | SSTC-S Inland | 1 | 22 | 24 |
| 63 | Stalking, Movement, Hide-Sites | Training provides teams with the skills to clandestinely patrol an inland area and assess risks from potential enemy forces. Team members learn to camouflage themselves and move through an area undetected. | SSTC-N Boat Lanes-Red 1&2<br>SSTC-S Beach Lanes-White and Purple 1&2<br>SSTC Inland | 5 | 8 | 8 |
| 64 | Close Quarter Combat/Close Quarter Defense | Training in clearing a building or structure of enemy personnel. Personnel and occasionally military trained dogs (inserted via helicopter, CRRCs, or light-wheeled vehicles) move on the periphery, breach through doors, and move through the internal sections of a building or structure, locating and extracting individuals and securing the area for a larger team. | All SSTC-S Boat and Beach<br>Lanes 11-14<br>SSTC-S Inland | 1 | 109 | 198 |
| 65 | Communications | Classroom instruction and a practical test, evaluation, and movement. | SSTC-S Inland | 5 | 6 | 6 |

**Table 2-1: Baseline and Proposed Tempos for SSTC Training Activities (Continued)**

| # | Activity | Description | Location | Days to Complete Each Event | Events per Year | |
|---|---|---|---|---|---|---|
| | | | | | No Action | Alternatives 1&2 |
| 66 | UAS Training | Low-level take off/landing practice and training for UASs used for observation and enhanced reconnaissance. | SSTC-S Inland | 5 | 12 | 12 |
| 67 | Around the World | Students paddle in CRRCs from beach lane Yellow-1, around NASNI, to bayside SSTC, cross over to the oceanside through tunnel at Silver Strand State Beach (SSSB), and portage or paddle back to Yellow-1 during a timed interval. | All SSTC-N Boat and Beach Lanes 1-10 Alpha, Bravo, Charlie, Delta I, II, III, Echo, Foxtrot NASNI, Breakers Beach | 1 | 6 | 6 |
| **NTA 4.9.4 Provide/Execute Training for U.S. and Other Nation Units and Individuals** | | | | | | |
| | **NSW Physical Fitness Training** | | | | | |
| 68 | Physical Training Runs | As an essential part of training, BUD/S running groups averaging 30-150 persons run a variety of distances on the beach ranging from 4-6 miles. Trainees may occasionally have a military working dog participating in the physical conditioning. Timed runs also are conducted for 4- and 14-mile distances which extend outside of SSTC. | All SSTC Beach Lanes 1-14 SSSB | 1 | 464 | 464 |
| 69 | Physical Readiness Training | Training with timed runs along the beach, open-water swims, push-ups, and sit-ups make up near-daily physical fitness conditioning and can include organized runs of students or staff personnel of up to 100 persons. | All SSTC-N Boat and Beach Lanes 1-10 SSTC Inland Delta III, Foxtrot | 1 | 280 | 280 |
| 70 | Swim Training | Ocean swim in a variety of temperatures and surf conditions. Students also swim in groups for 2-, 3.5-, and 5.5-mile swims. The location of the swim depends on the ocean conditions. | All SSTC-N Boat and Beach Lanes 1-10 Alpha, Bravo, Charlie, Delta I, II, III Waters off of SSSB and Coronado City Beach | 1 | 170 | 172 |

**Table 2-1: Baseline and Proposed Tempos for SSTC Training Activities (Continued)**

| # | ACTIVITY | DESCRIPTION | LOCATION | DAYS TO COMPLETE EACH EVENT | EVENTS PER YEAR | |
|---|---|---|---|---|---|---|
| | | | | | NO ACTION | ALTERNATIVES 1&2 |
| 71 | Hell Week | Consists of a period of nonstop training revolving around learned activities: surf passage in inflatable boats, rock portage, "around the world" paddling, hydrographic reconnaissance, running, swimming, and use of the obstacle course. The existing SSTC-N demolition pit may be filled with water and used for temperature conditioning. | All SSTC Boat and Beach Lanes 1-14 Alpha-Hotel SSTC-S Inland, NASNI Breakers Beach Waters around NASNI, SSSB, and Coronado City Beach | 5 | 6 | 6 |
| 72 | Rucksack March | While carrying a 65-75 pound pack, students hike 5 to 14 miles within specified time limits. | All SSTC Beach Lanes 1-14 SSTC-S Inland Coronado beach SSSB | 1 | 54 | 54 |
| 73 | Monster Mash | Course consisting of a minimum 10-mile run, 2-mile swim, 3-mile boat paddle, and rock portage. | All SSTC Boat and Beach Lanes 1-14 SSTC-S Inland Coronado beach SSSB | 1 | 6 | 6 |
| **NTA 4.12.6 Provide Industrial and Environmental Health Services** | | | | | | |
| 74 | Conduct Environmental Health Site Assessment | Usually conducted as part of another training event and consists of establishing a small camp and interacting with other units to practice providing preventative medicine to field personnel. Part of their training may include learning to collect and analyze air and soil samples in areas where operations occur. | SSTC-S Beach Lanes- Purple 1&2 SSTC-S Inland | 3 | 3 | 3 |
| **NTA 6.1.1 Protect Against Combat Area Hazards** | | | | | | |
| 75 | Conventional Ordnance/ Improvised Explosive Device (IED) Response | On-foot search for exposed and buried inert (nonexplosive) unexploded ordnance (UXO) and IEDs. Metal detectors and hand tools are used to discover and excavate buried UXOs. After UXOs and IEDs have been properly identified, a detachment simulates neutralization of threats using render-safe procedures and simulated detonation in place. | All SSTC-N Beach Lanes* | 1 | 64 | 120 |

*Locations listed are for No Action Alternative only and will be expanded under Alternative 1 and 2. The expanded locations are detailed in Table 2-3. Appendix C provides activity details regarding marine vessels, personnel, ordnance, and vehicles.

**Table 2-1: Baseline and Proposed Tempos for SSTC Training Activities (Continued)**

| # | ACTIVITY | DESCRIPTION | LOCATION | DAYS TO COMPLETE EACH EVENT | EVENTS PER YEAR | |
|---|---|---|---|---|---|---|
| | | | | | NO ACTION | ALTERNATIVES 1&2 |
| 76 | Land Mine Detection/ Neutralization | On-foot search for inert (nonexplosive) land mines buried in the sand. Once probing techniques using hand tools and metal detection uncover buried land mines, a detachment group simulates neutralization of the mines using simulated explosives. | All SSTC-N Beach Lanes* | 1 | 24 | 45 |
| **NTA 6.3.1 Force Protection: Protect and Secure Area of Operations** | | | | | | |
| 77 | Field Training Exercise (FTX) (e.g., SEAHAWK) | Provides training in conducting port and coastal waterborne force protection, harbor defense, and seaward security. Manning can vary from 50 to 1,000 personnel depending on scope and participation. Armed patrol boats conduct simulated patrol missions in the San Diego Bay. Campsites are established, including erection of tents (communication gear, conference room, operations center, operational galley, latrines, field mess, and 14-person berthing) and generators. | SSTC-S Inland Delta I, II, III, Echo, and Foxtrot San Diego Bay | 1-14 | 53 | 53 |
| **NTA 6.3.3 Combat Terrorism** | | | | | | |
| 78 | Small Boat Attack | A small boat performs an attack in the form of runs on an anchored ship. | SSTC-N Boat Lanes 1-10 Breakers Beach | 1 | 30 | 36 |

*Locations listed are for No Action Alternative only and will be expanded under Alternative 1 and 2. The expanded locations are detailed in Table 2-3. Appendix C provides activity details regarding marine vessels, personnel, ordnance, and vehicles.

### 2.2.3 Silver Strand Training Complex Access Restrictions

The regulatory environment for SSTC is complicated, particularly due to the existence of several Endangered Species Act (ESA)-listed species (described in Section 1.5.2). Existing SSTC biological environmental management and associated training restrictions are a result of historical consultations with USFWS. The history of ESA consultation, as well as a discussion of environmental management practices at SSTC, is provided in the relevant sections of Chapter 3 of this EIS. The majority of access restrictions were proposed by the Navy in an effort to protect listed species on its land, consulted on with the USFWS, and formalized in a number of previous Biological Opinions and Memorandums of Understanding issued by the USFWS addressing impacts to the California least tern and western snowy plover. The Navy has continuously modified its management program and associated access restrictions over the years to adapt to the changing distribution and population of listed species as well as evolving training needs. The following is a summary of the current access restrictions on SSTC that are proposed for modification under Alternatives 1 and 2 and detailed in Section 2.3.5. Under the No Action Alternative, the Navy would continue its existing access restrictions:

- Protected nesting habitat for the California least tern and western snowy plover within SSTC-N occurs on three oceanside training lanes (Blue 2, Orange 1, and Orange 2) and two bayside training areas (Delta North and South), which restricts military foot and vehicle traffic except in defined beach crossing lanes during breeding seasons (March to September) of western snowy plover and California least tern.
- Buffers up to 30 meters in diameter are established around western snowy plover nests that are identified in the training areas. Training activities are not allowed in the buffered areas.
- Vehicle traffic within SSTC-S inner training areas is restricted to roads. Training activities are not allowed in vernal pools.

The access restrictions outlined above are only those that may be modified under Alternative 1 or Alternative 2. Other restrictions that would remain unchanged are addressed in the respective resource sections in this EIS.

## 2.3 ALTERNATIVE 1: INCREASE TRAINING AND ACCESS TO SSTC TRAINING AREAS (PREFERRED ALTERNATIVE)

Alternative 1, the Navy's preferred alternative, is designed to meet Navy and Department of Defense (DoD) current and near-term operational training requirements. It meets the selection criteria listed in Section 2.1.2. Under Alternative 1, the Navy would increase the tempo of training, introduce new types of training activities, conduct existing routine training at additional locations within SSTC training areas, introduce new platforms and equipment, and increase access and availability to SSTC training areas.

### 2.3.1 Increased Training Tempo

Under Alternative 1, the Navy would increase the tempo of training to meet 100 percent of Navy NTA requirements. This represents an increase from the baseline tempo of 3,926 activities to approximately 5,343 activities annually (Table 2-1).

Proposed increases under Alternative 1 were based on the commands' needs to meet required training levels. Training tempos proposed under this alternative consider changing training requirements, introduction of new technologies, the dynamic nature of international events, advances in warfighting doctrine and procedure, and force structure changes.

Implementation of Alternative 1 would meet the training requirements for units, resulting in a 100-percent support level for Navy NTA tempo requirements. The required level of tactical training and testing would be achieved while recognizing logistical, personnel, budgetary, and environmental considerations.

### 2.3.2 Description of New Training

Under Alternative 1 (and Alternative 2), the Navy would continue to conduct current training as described under the No Action Alternative. The Proposed Action does not include an increase in personnel tempo or in permanently stationed personnel; however, it does include an increase in activities performed by existing personnel as shown in Table 2-1. In addition to an increase in tempo, the Navy proposes to conduct new types of training as summarized in Table 2-2.

**Table 2-2: Proposed New Training Activities at SSTC for Alternatives 1 and 2**

| Op # | Activity | Description | Location | Days to Complete Each Event[1] | Events per Year |
|---|---|---|---|---|---|
| **NTA 1.3.1 Perform Mine Countermeasures (MCM)** | | | | | |
| N1 | Shock Wave Action Generator (SWAG) | SWAG is a tool used by EOD to disarm enemy limpet mines which have been attached to the hull of a ship. The SWAG is composed of a cylindrical steel tube, 3 inches long and 1 inch wide, containing approximately 15 grams (0.033 pounds) of explosives. The single explosive charge is highly focused and is equal to two diver recall devices. For SWAG training, a metal sheet containing an inert mine is lowered from the side of a small vessel, such as an LCM-8 craft or CRRC. Divers place a single SWAG on the mine that is located mid-water column, within water depths of 10-20 feet. A bag is placed over the mine to catch falling debris. | All SSTC oceanside Boat Lanes 1-14 Echo | 1 | 90 |
| N2 | Surf Zone Test Detachment/ Equipment T&E | To support clearance capability in the surf zone (out to 10 feet of water), EOD would test and evaluate the effectiveness of new detection and neutralization equipment designated for surf conditions. Use of explosives will occur during 1% of training activities (0.1 to 20 lbs NEW) and will only occur in the SSTC Boat Lanes. | All SSTC Boat and Beach Lanes 1-14 Echo | 1 | 200 |
| N3 | UUV Neutralization | Training consists of placing 2 sequential charges consisting of a Seafox (3.3 pounds) or Archerfish (3.57 pounds) charge placed from depths of 10 feet to the bottom in water depth less than 72 feet. | All SSTC Boat and Beach Lanes 1-14 | 1 | 4 |
| N4 | AN/AQS-20 Mine Hunting | The training would involve an MH-60S helicopter deploying into the water and towing the AN/AQS-20 active high resolution, side-looking, multibeam sonar system for hunting simulated (inert) mines along the ocean floor. | All SSTC oceanside Boat Lanes 1-14, in water depths greater than 40 feet. | 1 | 200 |
| N5 | AN/AES-1 Airborne Laser Mine Detection System | The training would involve an MH-60S helicopter using a helicopter-mounted Light Detection and Ranging blue-green laser technology to detect, classify, and localize floating and near-surface moored mines in shallow water. Mines used in training are inert. | All SSTC oceanside Boat Lanes 1-14 in water depths greater than 40 feet. | 1 | 48 |
| N6 | AN/ALQ-220 Organic Airborne Surface Influence Sweep (OASIS) | The training would involve an MH-60S helicopter towing the OASIS device that emulates magnetic and acoustic signatures of the ships in the water. | All SSTC oceanside Boat Lanes 1-14, in water depths greater than 40 feet. | 1 | 100 |

[1]The training activities listed in Table 2-2 take around 2-5 hours, depending on a variety of factors including training conditions and skill levels of the personnel being trained.

### Table 2-2: Proposed New Training Activities at SSTC for Alternatives 1 and 2 (Continued)

| Op # | Activity | Description | Location | Days to Complete Each Event[1] | Events per Year |
|---|---|---|---|---|---|
| **NTA 1.3.1 Perform Mine Countermeasures (MCM)** | | | | | |
| N7 | Airborne Mine Neutralization System (AMNS) | The training would involve an MH-60S helicopter deploying an AMNS underwater vehicle into the water that searches for, locates, and destroys mines. The vehicle is self-propelled and unmanned. Approximately 20% of the training would involve the AMNS being remotely detonated (3.5-pound NEW) when it encounters a simulated (inert) mine shape. | All SSTC oceanside Boat Lanes 1-14, in water depths greater than 40 feet. | 1 | 48 |
| **NTA 1.5.4 Conduct Amphibious Operations** | | | | | |
| N8 | Tactical Recovery of Aircraft and Personnel (TRAP) | To simulate the rescue of a downed helicopter and its crew through an amphibious raid, usually at nighttime, TRAP consists of the insertion of up to 75 personnel ashore via four to six helicopters hovering and/or landing at a designated inland drop zone in northern part of SSTC-S. Activities include foot movement ashore, manual excavations, light-wheeled vehicles, and use of small arms (blanks) and pyrotechnics to simulate attacks. | All SSTC-S Beach Lanes SSTC-S Inland | 1 | 4 |
| **NTA 1.5.6 Conduct Naval Special Warfare** | | | | | |
| N9 | Underwater Demolition Qualification/ Certification | Demolition Requalifications and Training provides teams with experience in underwater detonations by conducting detonations on metal plates near the shoreline. At water depths of 10 to 72 feet two sequential 12.5-13.75 pound NEW charges are placed on the bottom or a single 25.5-pound charge is placed from a depth of 20 feet to the bottom. | All SSTC Boat and Beach Lanes 1-14 | 1 | 12 |
| N10 | Vehicle Patrolling and Testing | Personnel use the beach and inland areas for driving familiarization of various vehicles, and gear configuration and setup. | SSTC-N Beach SSTC-S Beach SSTC-S Inland | 1 | 50 |
| N11 | NSW Underwater Demolition Training | Up to 40 persons participate in the activity, which involves small groups swimming to shore from four inflatable boats located approximately 1,000 yards offshore; boats may be beached on shore. A single charge of less than 10 pounds NEW (if detonated on the bottom) or less than 3.6 pounds NEW (if within five feet of the surface) is manually detonated near the shoreline in water less than 24 feet deep. | All SSTC Boat and Beach Lanes 1-14 | 1 | 12 |

[1]The training activities listed in Table 2-2 take around 2-5 hours, depending on a variety of factors including training conditions and skill levels of the personnel being trained.

### 2.3.3 Conduct Existing Routine Training at Additional Locations within SSTC Established Training Areas

Under Alternative 1 (and Alternative 2), the Navy proposes to conduct the existing routine training at additional locations within SSTC established training areas (Table 2-3). These activities would be conducted in established training areas that are currently being used for other types of training.

**Table 2-3: Expanded Locations of Activities**

| OP # | ACTIVITY | CURRENT LOCATIONS | EXPANDED LOCATIONS |
|---|---|---|---|
| **NTA 1.1.2 Conduct Maneuver-Move Forces** | | | |
| 1 | Anchoring | All SSTC-N Boat Lanes 1-10 | All SSTC-N Boat Lanes 1-10<br>Breakers Beach |
| **NTA 1.5.4 Conduct Amphibious Operations** | | | |
| 19 | SUROBS | All SSTC-N Beach Lanes 1-10 | All SSTC Beach Lanes 1-14 |
| **NTA 1.5.6 Conduct Naval Special Warfare** | | | |
| 31 | Breacher Training | SSTC-S Inland (Bunker 98, Bunker 99 Interior) | SSTC-S Inland (Bunker 98, Northwest and east of Bunker 99, Bunker 99) |
| **NTA 4.5.6 Construct, Maintain, and Operate Logistics Over-the-Shore** | | | |
| 48 | Field Training with a Beach Camp | All SSTC-N Beach Lanes 1-10, | All SSTC Beach Lanes 1-14<br>SSTC-S Inland |
| 49 | MPS Offload | All SSTC-N Boat and Beach Lanes 1-10 | All SSTC Boat and Beach Lanes 1-14<br>SSTC-S Inland |
| 50 | ROWPU | All SSTC-N Beach Lanes 1-10 | All SSTC Beach Lanes 1-14<br>SSTC-S Inland |
| **NTA 4.9.1 Naval Special Warfare Diving and Beach Operations** | | | |
| 55 | Open Circuit Breathing Diving | All SSTC-N Boat and Beach Lanes 1-10<br>Breakers Beach<br>Alpha-Hotel | All SSTC Boat and Beach Lanes 1-14<br>Breakers Beach<br>Alpha-Hotel |
| 57 | Rock Portage | All SSTC-N Boat and Beach Lanes 1-10<br>Breakers Beach and Zuniga Jetty<br>Coronado Rock Jetty | All SSTC Boat and Beach Lanes 1-14<br>Breakers Beach and Zuniga Jetty<br>Coronado Rock Jetty |
| **NTA 6.1.1 Conduct Explosive Ordnance Disposal** | | | |
| 75 | Conventional Ordnance/IED Response | All SSTC-N Beach Lanes 1-10 | All SSTC Beach Lanes 1-14 |
| 76 | Land Mine Detection/ Neutralization | All SSTC-N Beach Lanes 1-10 | All SSTC Beach Lanes 1-14 |

### 2.3.4 Introduction of Platforms and Equipment

SSTC is required to accommodate and support training with new vessels, aircraft, and vehicles as they become operational in the Fleet. Based on knowledge of future training requirements, the Navy has identified a need for replacement of AAVs with Expeditionary Fighting Vehicles (EFVs) and updates to the current OPDS. Following is a discussion of each of the new platforms and equipment. Environmental planning documentation related to new platforms and equipment field and basing has been incorporated by reference (Section 1.7).

#### 2.3.4.1 Expeditionary Fighting Vehicles

Replacement of AAVs currently in use with EFVs provides many advantages to the Navy, including enhanced survivability, ship to shore movement, and operational capabilities. The EFV differs from the AAV primarily in its improved in-water capabilities, exhibiting an extended in-water range over the AAV and a significantly higher top speed (DoN 2003). The EFV is also larger and heavier than the AAV. Differences between the AAV and EFV are summarized in Table 2-4.

**Table 2-4: AAV/EFV Comparison**

| | | AAV | EFV |
|---|---|---|---|
| Top Speed | Sea | 8 mph (13 kph) | 29 mph (47 kph) |
| | Land | 45 mph (72 kph) | 45 mph (72 kph) |
| Size | Length | 26 feet (7.9 m) | 29 feet 10 in (9.1 m) |
| | Width | 10 feet 9 in (3.3 m) | 12 feet (3.7 m) |
| Weight | Empty | 42,108 pounds (19,100 kg) | 62,880 pound (28,522 kg) |

#### 2.3.4.2 Offshore Petroleum Discharge System Updates

The current OPDS training at SSTC is described in Table 2-1 and consists of rolling out a four mile fluid-transfer conduit from the beach out to approximately one mile offshore and anchoring it to the seafloor with a SALM. This activity trains personnel in the transfer of petroleum (though only sea water is used during training) from ship to shore. The improved OPDS system would have a self-sinking hose that could extend up to eight miles offshore, but like the current OPDS, would still be rolled out to approximately one mile offshore during training activities at SSTC.

#### 2.3.4.3 MH-60S Seahawk Multi-Mission Helicopter

Primary missions for the MH-60S Seahawk Multi-Mission helicopter include troop transport, vertical replenishment, and mine warfare. These aircraft will feature advanced sensors and weapons systems including new organic airborne mine countermeasures systems (DoN 2008). Training associated with the MH-60S Seahawk Multi-Mission Helicopter would require establishment of a shallow water (inert) minefield in the oceanside training lanes of SSTC in water depths greater than 40 feet. Approximately 15 mine shapes would be anchored on the bottom or moored at various water depths, and would remain in place up to 6 months before Navy divers would recover them for refurbishment and repositioning/relocation.

### 2.3.5 Increase Access and Availability to SSTC Training Areas

Under Alternative 1, the Navy is proposing to increase access and availability of SSTC oceanside Beach Training Lanes 1 through 10 and SSTC-S inland areas for military training. The proposed changes are described below and depicted on Figures 2-1 and 2-2. The Navy consulted with the USFWS through the ESA Section 7 process on the proposed access increases and other elements of this Alternative. The USFWS issued its Final Biological Opinion July 7, 2010 (FWS-SDG-08B0503-09F0517) and details are presented in Sections 3.11 and 3.12 of this FEIS.

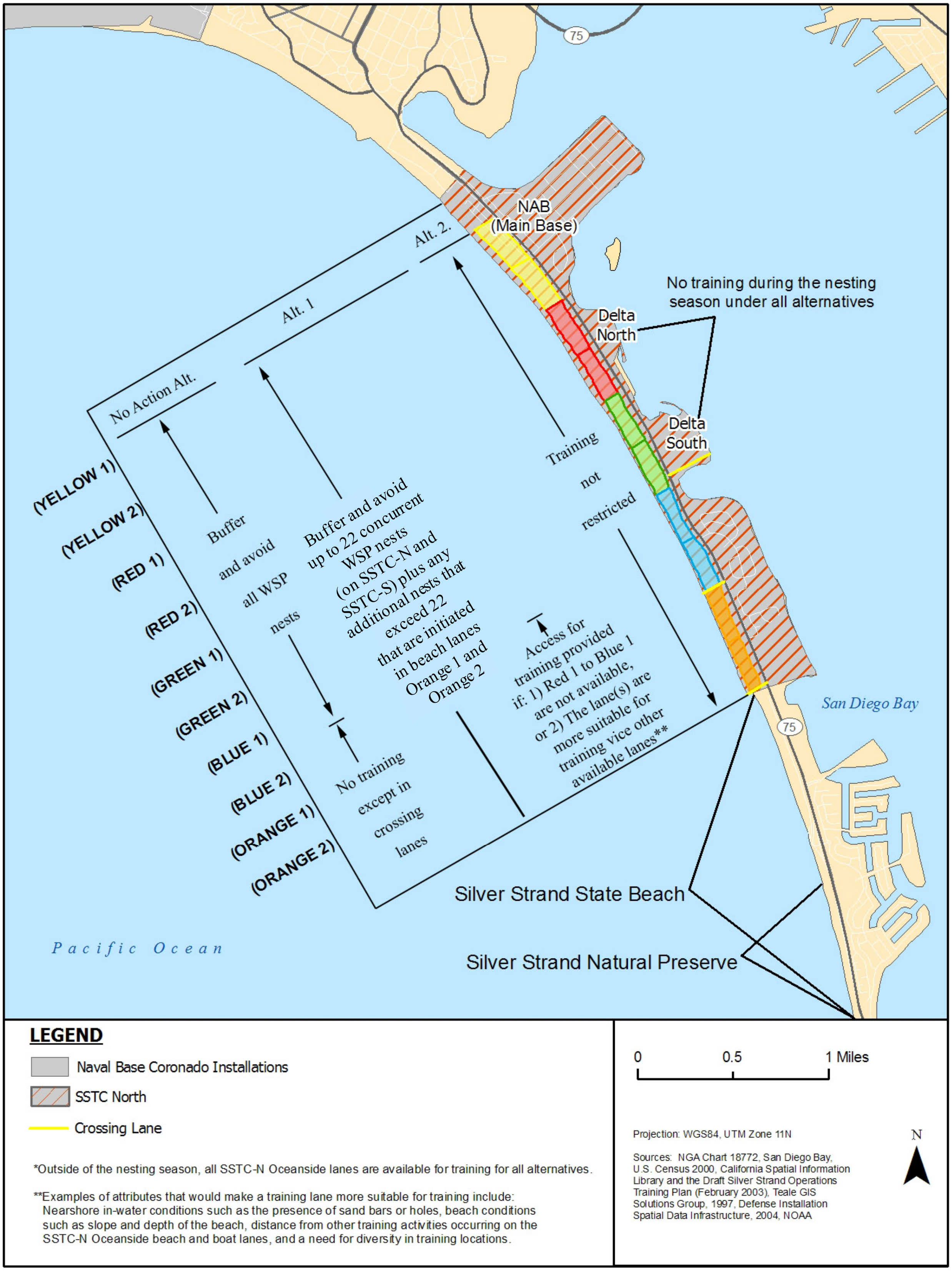


**Figure 2-1: Proposed Increase in SSTC-N Beach Access and Availability for All Alternatives**

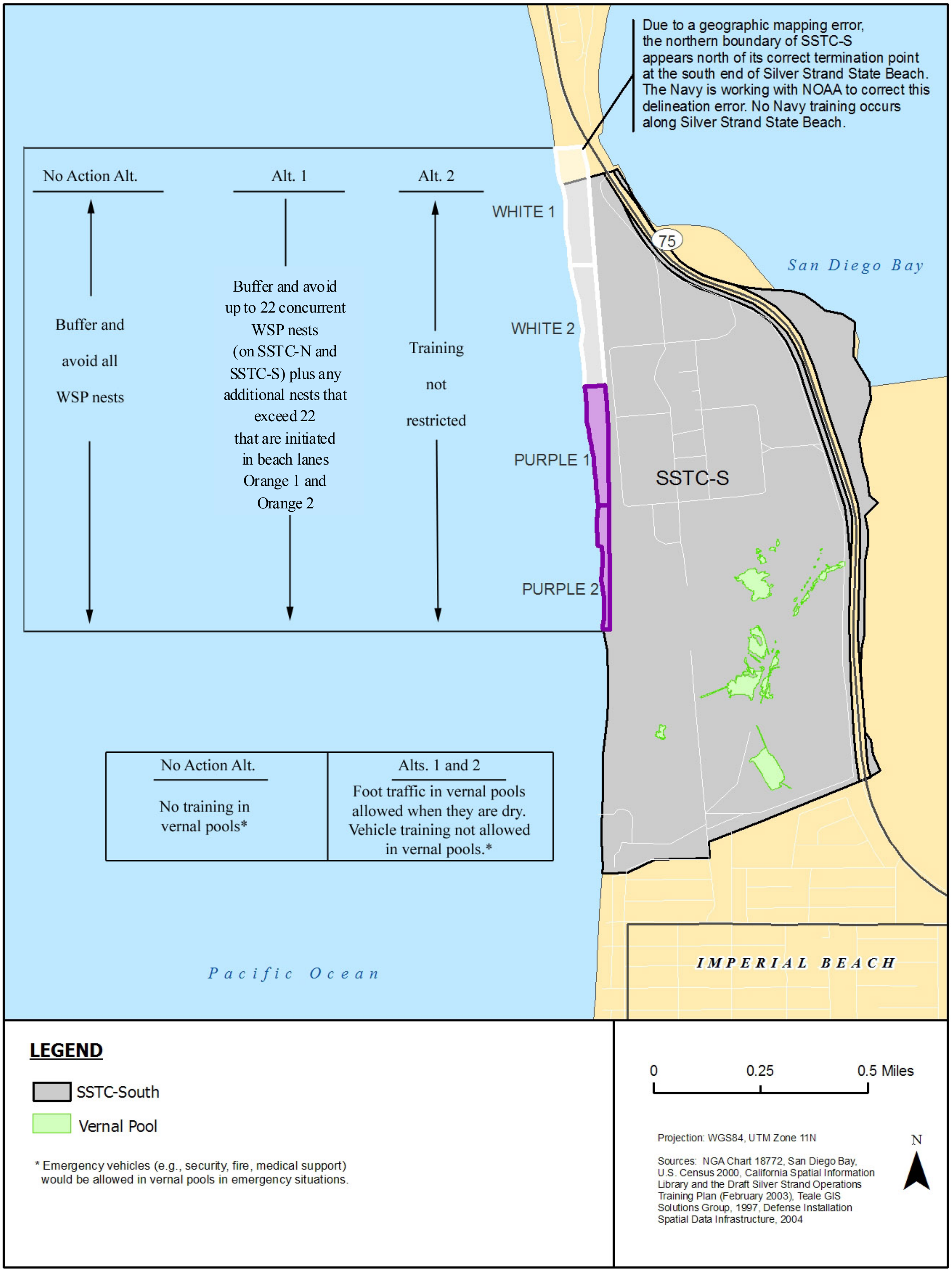


**Figure 2-2: Proposed Increase in SSTC-S Beach and Inland Area Access and Availability for All Alternatives**

Increase Access to Oceanside Beach Lanes 8-10 (Blue 2, Orange 1, and Orange 2). To accommodate the proposed training tempo and to increase flexibility for training, the Navy is proposing two independent criterion that, if either is met, would allow for conditional usage of SSTC-N training lanes Blue 2, Orange 1, and/or Orange 2 for training during the nesting season.

The first criterion allows for use of Blue 2, Orange 1, and/or Orange 2 for training when a training lane(s) is needed and other suitable training lanes are already occupied and unavailable for use. Beach lanes Blue 2, Orange 1, and/or Orange 2 would be used during the nesting season if Beach Lanes Red 1 and 2, Green 1 and 2, and Blue 1 are being used and additional training lanes(s) are needed for training. The beach lanes would be opened one at a time, based on need, with Blue 2 being opened first, Orange 1 being opened second, and Orange 2 being opened last, where such selection will maintain the realism of training and training needs.

Under the second criterion, training would be allowed in Blue 2, Orange 1, and/or Orange 2 if attributes of those lane(s) make them more suitable for meeting training needs than other available training lanes Examples of lane attributes which may allow usage of Blue 2, Orange 1, and/or Orange 2 include but would not necessarily be limited to: nearshore in-water conditions such as the presence of sand bars or holes, beach conditions such as slope and depth of the beach, distance from other training activities occurring on SSTC-N oceanside beach and boat lanes, and a need for diversity in training locations.

Increase Access to Oceanside Beach Lanes 1 through 14. The Navy proposes to limit the number of western snowy plover nests that will be marked and buffered for avoidance on SSTC-N and SSTC-S oceanside beaches to no more than 22 concurrent nests plus any additional nests that exceed 22 that are initiated in beach lanes Orange 1 and Orange 2. Staking would continue to mark the perimeter of a buffer zone with a diameter of 30 meters or less around the western snowy plover nests.

Increase Access to SSTC-S Inland Training Areas. The Navy is proposing to allow foot traffic associated with training in vernal pools when conditions are dry. Training activities would not be allowed in vernal pools when conditions are wet. To the maximum extent consistent with training need, off-road foot traffic will avoid the occupied vernal pools and their watersheds. The Navy will avoid the occupied vernal pools and their watersheds adjacent to the road at SSTC-S Inland (i.e., pools 1 through 7 marked with flexi-stakes) year round to the maximum extent consistent with training need. The Navy will be completing a Vernal Pool Management and Monitoring Plan which will include focused invasive plant surveys in the pools and their watersheds; plant, topographic, hydrological, and water quality surveys (including salinity); and protocol fairy shrimp surveys. The Vernal Pool Management and Monitoring Plan will list: 1) what criteria are used to determine that the pools are dry and 2) who makes the “dry” determination (i.e., the qualifications of the person responsible for determining wet and dry conditions).

## 2.4 ALTERNATIVE 2: INCREASE TRAINING AND FURTHER ENHANCE ACCESS TO SSTC TRAINING AREAS

Alternative 2 meets Navy and DoD current and near-term operational training requirements, and further enhances training capabilities at SSTC. It meets the criteria listed in Section 2.1.2 by: providing the resources needed to meet the requirements of individual and unit-level training; accommodating required training tempos; allowing for year-round, assured access to San Diego Bay, ocean areas, beach areas, and inland training areas; providing a realistic training environment; accommodating the full suite of required training elements at SSTC; and providing co-location of commands, equipment, facilities, and infrastructure that support existing and future training. Under Alternative 2, proposed training tempo and types of training, training location, as well as the introduction of new platforms and equipment into training, would be the same as described under Alternative 1. The Navy would increase the tempo of training to meet 100 percent of Navy NTA requirements (Table 2-1). As described under Alternative 1, this would represent an increase from the baseline tempo of 3,926 activities to approximately 5,343 activities annually. The only differences between Alternative 1 and Alternative 2 are additional access and availability of SSTC-N training lanes.

Under Alternative 2, the Navy would fully utilize all 7,000 yards of ocean beaches along SSTC-N and SSTC-S, and all bayside training beaches, except the Delta North and South nesting habitat (i.e., Alpha, Bravo, Charlie, Echo, Foxtrot, Golf, and Hotel) for continuous, year-round training. The Navy would continue to conduct existing management practice on these lanes including nest relocation, predator management and control, habitat modification, site preparation for maintenance, nest substrate enhancement, signage and education, recreational use restrictions, and rearing of collected eggs, injured and sick individuals. Delta North and Delta South would continue to be managed as a California least tern nesting habitat during the five to six month breeding season, and used for training during the non-nesting period. Monitoring of the California least tern and western snowy plover at SSTC-N oceanside beaches would be performed for effect and “take” associated with military training.

## 2.5 COMPARISON OF ALTERNATIVES

Table 2-5 summarizes the key attributes of the No Action Alternative, Alternative 1 (Preferred Alternative), and Alternative 2. These alternatives have been addressed in further detail in Sections 2.2, 2.3, and 2.4, respectively.

As summarized in the table, Alternatives 1 and 2 would increase the tempo of training to meet the FRTP mandate for Fleet readiness and mission preparedness with a focus on enhanced training in littoral settings. Alternatives 1 and 2 would also include increases in the types and locations of training. The difference between the two alternatives is in level of access and availability to SSTC-N oceanside training areas. Under Alternative 1, select training lanes would be open only if others are being utilized or have attributes that make them more suitable for training. Alternative 2 proposes open, year-round usage of these SSTC-N oceanside training areas; all SSTC oceanside training lanes would be open for use, regardless of time of year.

**Table 2-5: Alternatives Summaries**

| | Tempos | Types of Activities | Training Locations | Access and Availability of Training Areas | Introduction of Platforms and Equipment |
|---|---|---|---|---|---|
| **No Action Alternative** | Baseline tempo (3,926) | No new types of activities would be introduced. | No new training activities would be added. | Existing access restrictions would continue. | Existing platforms would continue to be used. |
| **Alternative 1 (Preferred Alternative)** | Increase in annual tempo (5,343) | Introduction of new activities. | Additional locations in established training areas. | Access to oceanside beach lanes and SSTC-S training areas would conditionally increase. | EFVs, MH-60S and updated OPDS system. |
| **Alternative 2** | Increase in annual tempo (5,343) | Introduction of new activities. | Additional locations in established training areas. | Access to oceanside beach lanes would not be restricted for training. Access to SSTC-S training areas would be conditionally increased. | EFVs, MH-60S and updated OPDS system. |

# 3.0 Affected Environment and Environmental Consequences

# 3 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

## 3.0 CHAPTER ORGANIZATION

This chapter describes existing environmental conditions and assesses the environmental effects of the Proposed Action and alternatives described in Chapter 2. The affected environment and environmental consequences are described and analyzed according to categories of resources. The categories of resources addressed in this Environmental Impact Statement (EIS) are listed in Table 3-1.

**Table 3-1: Categories of Resources Addressed in the EIS**

| | |
|---|---|
| Land Use and Recreation (3.1) | Marine Mammals (3.9) |
| Geology and Soils (3.2) | Sea Turtles (3.10) |
| Air Quality (3.3) | Terrestrial Biological Resources (3.11) |
| Hazardous Materials and Waste (3.4) | Birds (3.12) |
| Water Resources (3.5) | Cultural Resources (3.13) |
| Acoustic Environment (Terrestrial) (3.6) | Transportation and Circulation (3.14) |
| Marine Biological Resources (3.7) | Socioeconomics, Environmental Justice, and Protection of Children (3.15) |
| Fish (3.8) | Public Health and Safety (3.16) |

In the environmental impact analysis process, the resources analyzed are identified and the expected geographic scope of potential impacts for each resource, known as the resource's region of influence, is defined. The discussion and analysis, organized by resource area, covers the oceanside lanes of the Silver Strand Training Complex (SSTC), the beach areas of SSTC-North and SSTC-South (SSTC-S) (the bayside training areas, the inland areas of SSTC-S, and the southern beaches and nearshore waters of Naval Air Station North Island), to the extent affected resources or potential impacts are present (see Figure 1-2). The analyses presented are addressed by similarity of activity, such as aircraft exercises, marine vessel exercises, Landing Craft, Air Cushion activities, underwater detonations, Elevated Causeway/Pile Driving, beach exercises and inland exercises. These training activities are broken down further for specific resource analyses—for example, beach activities can be organized into groups such as vehicle use, foot traffic, manual excavations, fluid transfer activities, pyrotechnics, simunitions/blanks, or solid waste.

For each resource area, specific activities (as listed in Chapter 2, Tables 2-1 through 2-3) are listed in terms of the potential to affect the subject resource. The analysis of listed activities considers the type, frequency, duration, and intensity of the activity, as well as use of existing training equipment (vessels, vehicles, and aircraft as described in Appendix B). In addition, platforms and training equipment associated with force structure changes (described in Section 2.3.4) are also considered as part of the analysis of training activities.

Activities with the potential to affect the resource are carried forward for environmental analysis in the EIS. For example, the potential impact associated with aircraft during training is anticipated to be minimal on marine plant and invertebrate populations and this type of activity will not be assessed. In contrast, the potential for impacts of air activities on air quality is much higher and requires a more detailed level of analysis. Each resource introduction presents a brief explanation of the logic utilized to determine which training activities are included or excluded for effects analysis. In addition, criteria used to assess the significance of environmental impacts are provided—based on existing regulatory statutes or industry standards—for applicable resources.

### 3.0.1 Environmental Management and Mitigation Measures

The Navy has a comprehensive management program that considers biological resources, cultural resources, environmental compliance, and environmental resource education and interpretation. Environmental management is the means by which the environment, including natural and cultural resources, is conserved, protected, enhanced, and restored while ensuring military readiness and sustainability. The basis for Navy environmental resource management at SSTC is a holistic, long-term view of human activities in conjunction with air and water quality, cultural resources, land uses, noise ordinances, waste management, or other marine or terrestrial biological resources such as sensitive habitats and Endangered Species Act - listed species.

The Navy is responsible for compliance with federal environmental laws, rules, regulations, policies, and guidelines designed to protect marine and terrestrial environmental and cultural resources at SSTC, concurrent with the Navy's sustained utilization of SSTC for training. Environmental programs at SSTC balance the need for environmental protection with the training mission, such that naval forces maximize the benefits of SSTC training assets while minimizing adverse effects on the environment.

To achieve this balance, the Navy monitors the effects of training activities on environmental resources, using an adaptive management strategy to modify resource management in response to the ongoing influx and evaluation of monitoring data. Through this approach, the Navy's environmental resource managers acquire information to identify potential impacts in a timely manner, thus allowing for ongoing adjustments to training and/or resource management while keeping the training mission on schedule to meet necessary training goals. The monitoring effort is focused not only on the environmental resource, such as a protected species, but also on the operational and administrative setting for training activities potentially affecting the resource.

In describing and analyzing affected resources and environmental consequences, the following subsections in this chapter identify current mitigation measures such as Standard Operating Procedures, Best Management Practices, and Conservation Measures that are integral to the activities covered by the Proposed Action and Alternatives. The subsections in this chapter also identify further measures the Navy proposes that are not currently being undertaken that would mitigate environmental impacts to a given resource. Mitigation measures are also presented in Chapter 5.

# 3.1 Land Use

# 3.1 LAND USE AND RECREATION

## 3.1.1 Affected Environment

### 3.1.1.1 Introduction

#### 3.1.1.1.1 Definition

For purposes of this analysis, land use is defined as the natural conditions and/or human-modified activities occurring at a particular location. Human-modified land use categories include residential, commercial, industrial, transportation, communications and utilities, agriculture, institutional, recreational, and other developed use areas. Management plans and zoning regulations determine the type and extent of land use allowable in specific areas, and are intended to protect specifically designated or environmental sensitive areas.

Recreational resources are defined as those amenities that provide for relaxation, rest, activity, education, or other opportunities for leisure services and community support that lead to an enhanced quality of life. These include natural reservations, parks, parkways, beaches, fishing areas, playgrounds, and community gardens.

#### 3.1.1.1.2 Regional Setting

Naval Base Coronado (NBC) is an important Navy installation and is located in San Diego County—a county that has the largest concentration of naval forces in the United States. NBC includes Naval Air Station, North Island (NASNI), Naval Amphibious Base (NAB) Coronado, and the former Naval Radio Receiving Facility (NRRF). The Silver Strand Training Complex (SSTC) is located on NAB Coronado and NRRF property. SSTC is located between the City of Coronado to the north, and the City of Imperial Beach to the south. STTC is located on the Silver Strand peninsula, an isthmus of land between the Pacific Ocean to the west and San Diego Bay to the east (Figure 3.1-1). NASNI is located at the north end of the Coronado peninsula, northwest of the City of Coronado. Land use in the surrounding area consists of mixed residential and commercial, hotel/motel uses, commercial recreation, civic use, open space, and military land uses.

#### 3.1.1.1.3 Region of Influence

The Region of Influence (ROI) for land use and recreation includes inside the boundaries of SSTC-North (SSTC-N) and SSTC-South (SSTC-S), the neighboring areas of SSTC-N and SSTC-S, the southern beaches and nearshore waters of NASNI (from Breakers Beach to Zuniga Jetty), and the adjacent waters of the San Diego Bay and Pacific Ocean.

### 3.1.1.2 Plans and Policies

The SSTC is on federally owned land, as well as on land leased from the State of California, which is excluded from local and state jurisdictions with regard to land use controls. Nevertheless, programs, policies, and local land use plans (each city plans its land use by preparing and adopting a state-required General Plan, as well as a Local Coastal Plan [LCP] for property within the coastal zone) for surrounding areas are discussed within this Environmental Impact Statement (EIS). The Navy has developed land use planning documents relevant to the project site, which also are addressed in this EIS.

#### 3.1.1.2.1 Naval Amphibious Base Coronado Master Plan

The NAB Coronado Master Plan gives interim direction for realistic and logical physical planning policy and ensures efficient, orderly use and development of facilities and real estate.

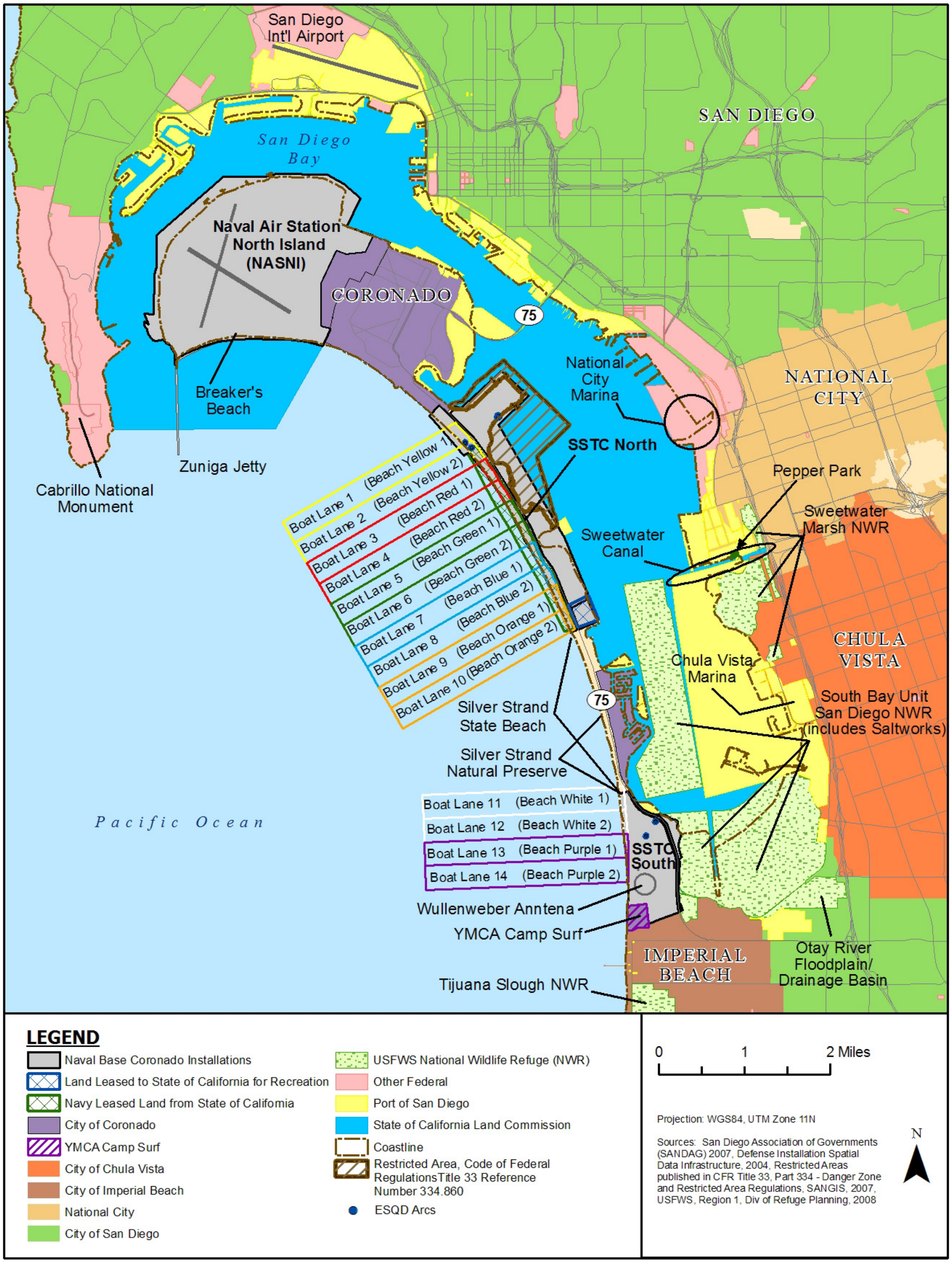


**Figure 3.1-1: Regional Jurisdictions**

#### 3.1.1.2.2 City of Coronado Local Coastal Program Land Use Plan

The City of Coronado's land use plan is the culmination of Coronado's LCP; it consolidates and coordinates Coronado's LCP Policy Group background reports (City of Coronado 2004). Further, the land use plan presents policy, action, and land use proposed by the city to implement the requirements and intent of the California Coastal Act (CCA) of 1976, as amended.

#### 3.1.1.2.3 City of Coronado Zoning Ordinance

The purpose of the Zoning Ordinance is to regulate land use, intensity, building construction, and to control development. The zoning map for the City of Coronado denotes SSTC as a military zone. Land use adjacent to SSTC is zoned as open space and multiple-family residential (City of Coronado 2009). The Zoning Ordinance denotes the land across Glorietta Bay from NAB Coronado as a combination of open space, commercial recreation, and civic use.

#### 3.1.1.2.4 City of Coronado Glorietta Bay Master Plan

The purpose of the Glorietta Bay Master Plan is to enhance its critical shoreline property for the benefit of the Coronado community, to enhance public access and recreational opportunities along the bayfront, and to provide for a new community center and City Hall in a park-like setting. Glorietta Bay borders NAB Coronado to the northwest (City of Coronado 2008) (Figure 3.1-2).

#### 3.1.1.2.5 City of Imperial Beach General Plan and Coastal Plan

The City of Imperial Beach General Plan and Coastal Plan is the city's constitution for physical development and change (City of Imperial Beach 1994). The land use element of this plan designates the area adjacent to SSTC-S as public facility, urban reserve, and single-family residential.

#### 3.1.1.2.6 San Diego Unified Port District Master Plan

The San Diego Unified Port District (SDUPD) Master Plan is intended to provide the official planning policies for the physical development of the tide and submerged lands granted to the San Diego Unified Port District (SDUPD 1996). Portions of NBC are within the Port District's planning jurisdiction: all in-water bayside training areas and the bayside training beaches; the Navy coordinates accordingly, as it relates to Navy activities in these areas. However, SDUPD has no regulatory authority over land owned by the federal government. NAB Coronado, including the beaches of Delta South, Alpha, Bravo, and Charlie, are lands owned by the Federal government (Figure 3.1-2). The submerged lands adjacent to these areas are deeded submerged lands. All other lands and submerged lands on the bayside of the NAB Coronado are not deeded and are zoned wetlands and estuary under the Land and Water Use Element of the Master Plan. The remaining areas on the bayside of SSTC are active solar salt evaporation ponds (Salt Works).

### 3.1.1.3 Coastal Zone Management Act

The Coastal Zone Management Act (CZMA) of 1972 (16 USC Section 1451) encourages coastal states to be proactive in managing coastal zone uses and resources. CZMA established a voluntary coastal planning program; participating states submit a Coastal Management Plan (CMP) to the National Oceanic and Atmospheric Administration for approval. Under the CZMA, federal agency actions within or outside the coastal zone that affect any land or water use or natural resource of the coastal zone shall be carried out in a manner that is consistent to the maximum extent practicable, with the enforceable policies of the approved state management programs. Each state defines its coastal zone in accordance with the CZMA.

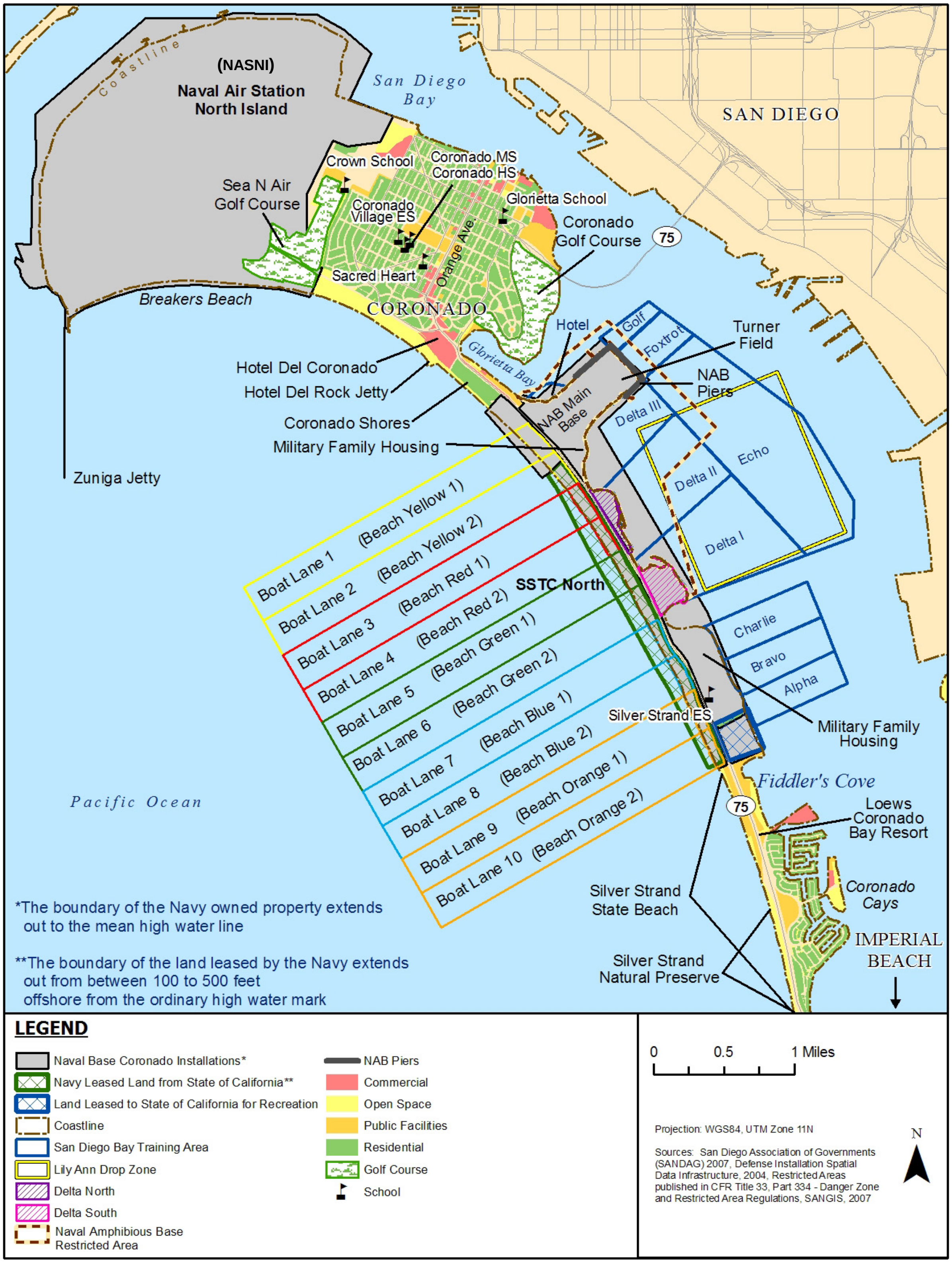


**Figure 3.1-2: SSTC-N Land Use**

Excluded from any coastal zone are lands the use of which by law is subject solely to the discretion of the federal government or which is held in trust by the Federal government (16 USC 1453). The Navy has completed the CZMA Federal Consistency Process for the SSTC EIS proposed action. The Navy submitted a Consistency Determination to the California Coastal Commission. The CD determined that the proposed activities are consistent to the maximum extent practicable with the applicable enforceable policies of the CA Coastal Act and the CA Coastal Management Program. The Coastal Commission provided a conditional concurrence for the proposed activities on August 17, 2010. In accordance with the CZMA Federal Consistency regulations, the Navy provided a final response to the Coastal Commission on November 23, 2010. The Navy determined that the conditions of concurrence proposed by the California Coastal Commission are not necessary for the proposed activities to be consistent to the maximum extent practicable with the applicable enforceable policies of the California Coastal Management Program (CCMP) as the Navy's proposed activities are consistent to the maximum extent practicable with the CCMP.

Chapter 6 provides a full description of the CZMA process and Appendix G provides a list of the SSTC CZMA documentation. Agency correspondence and supporting documentation can be found on the SSTC EIS website at www.silverstrandtrainingcomplexeis.com.

#### 3.1.1.4 Existing Land Use at SSTC-N

##### 3.1.1.4.1 SSTC-N Overview

As shown in Figure 3.1-2, SSTC-N is located on the north-central portion of the Silver Strand peninsula. SSTC-N is bounded on the north by the City of Coronado. Silver Strand Boulevard (State Route [SR]-75) runs parallel to the ocean connecting the City of Coronado with the City of Imperial Beach and separates SSTC-N’s bayside facilities from the oceanside training beaches. Downtown San Diego is situated three miles north of SSTC across the San Diego Bay. The San Diego International Airport is north of downtown San Diego; approximately five miles from SSTC (Figure 3.1-1).

SSTC-N comprises approximately 831 acres. About 257 acres are beach area property that the Navy has leased from the State of California since 1982 (Figure 3.1-2). The lease for the property will expire in August 2021. The extreme southeasterly portion of SSTC-N bayside is leased by the Navy to California for use as a park. The remainder of the land is held in fee simple by the Navy. SSTC-N’s leased area boundary along the coastline varies. At the northwest boundary of SSTC-N to approximately the center point of the Yellow Boat Lane 2, the westerly boundary extends out to the mean high water line. South of the centerline of the Yellow Boat Lane 2 the westerly boundary extends out from between 100 to 500 feet offshore from the ordinary high water mark.

##### 3.1.1.4.2 SSTC-N Surrounding Land Use

##### City of Coronado

SSTC-N is surrounded by a variety of land uses in the City of Coronado. Immediately north of SSTC-N, on the oceanside, is the Coronado Shores—a 1,467-unit, high-rise condominium complex located between SR-75 and the Pacific Ocean. North of SSTC-N, on the bayside, is a municipal park and administrative offices of the City of Coronado. The remaining portions of the City of Coronado, north of SSTC-N, consist of residential, commercial, retail, and hotel development uses—including the Hotel Del Coronado. Commercial development is primarily based along Orange Avenue. Community support facilities in the City of Coronado include a library, churches, educational facilities, a combined police and fire station, and hospital. Various parks and recreational facilities exist nearby, including a golf course and public beaches. Schools located within the City of Coronado are shown on Figure 3.1-2. Sacred Heart (K through 8) is the closest school to SSTC-N and is approximately 0.7 mile from the northern boundary. Silver Strand Elementary School is located within SSTC-N boundaries east of SR-75 on the bayside.

To the south of SSTC-N are Silver Strand State Beach (SSSB) and the Silver Strand Natural Preserve (SSNP) (Figure 3.1-1). On the bayside—east of Silver Strand Boulevard—is the Loews Coronado Bay Resort Hotel. Farther south of the Resort Hotel is the Coronado Cays residential community. The Coronado Cays consist of single-family and multi-family residences, recreational facilities, commercial activities, a park, open space, and public services. Large areas of undeveloped wetlands surround the Coronado Cays, these wetlands are preserved as a condition of the development of the Coronado Cays community (Department of the Navy 1998).

### Silver Strand State Beach

SSSB stretches from the southern end of SSTC-N, west of SR-75, to the northern end of SSTC-S. Camping facilities and other recreational activities are available on the beach side. The southern portion, to the south of the developed areas is the SSNP. The bayside of the park, north of the Loews Coronado Bay Resort, is restricted to pedestrian traffic only.

### San Diego Bay

The San Diego Bay is a natural harbor adjacent to downtown San Diego. The San Diego Bay is frequently used by recreational boaters from surrounding marinas and mooring areas. The City of San Diego, City of Coronado, City of Imperial Beach, City of Chula Vista, and National City all surround, and have an interest in activities within San Diego Bay. The Sweetwater Canal, located in south San Diego Bay is the site of the National City Marina and Pepper Park. Further south in San Diego Bay is the Chula Vista Marina. Both marinas are recreational boating access points that contribute to the amount of vessels within San Diego Bay (Figure 3.1-1).

Glorietta Bay is located to the north of SSTC-N on the bayside and is used by the public for recreation and pleasure boating (Figure 3.1-2). The majority of the SSTC operational piers are located at Glorietta Bay.

Fiddler’s Cove Marina and Recreational Vehicle (RV) Park is located to the south of SSTC-N on the bayside along Silver Strand State Highway/SR-75, just north of Loews Coronado Resort (Figure 3.1-2); it is operated by the Navy. The marina has approximately 150 moorings and approximately 130 dock slips; the RV Park offers year-round camping. Both facilities are open to active duty, retirees, Department of Defense (DoD) civilians, and sponsored civilian guests.

In San Diego Bay, there is a designated restricted area from the northern and eastern boundary of NAB Coronado (33 Code of Federal Regulations 334.860) (Figure 3.1-2); activities such as swimming, fishing, waterskiing, and mooring are not allowed within this area. All vessels entering the restricted area must proceed across the area by the most direct route and without unnecessary delay. For vessels under sail, necessary tacking constitutes a direct route.

### 3.1.1.4.3 SSTC-N On-site Land Use

SSTC-N occupies approximately 831 acres of which approximately 370 acres can be considered urbanized or occupied by buildings, paved roads, etc. Land uses at SSTC-N include both military and nonmilitary functions and facilities. On-base land use is separated into five distinct areas according to their use: Main Base, training beaches, recreational marina, military family housing, and public recreation areas. The entire oceanside of SSTC-N is used for training. The south bayside of SSTC-N is used for military family housing, a recreational marina, limited training activities, and a least tern nesting preserve. Oceanside and bayside training areas are accessible via on-site gates on SSTC-N. The extreme southeasterly portion of SSTC-N bayside is leased to California for use as a park and campground (Figure 3.1-2).

NAB Coronado is the primary developed area and contains over 170 buildings. Land use within the boundaries of NAB Coronado is divided into 10 categories: activities, training, maintenance, supply, medical, administration, housing, community support, recreation, and utilities. Turner Field is a helicopter-landing pad on NAB Coronado and is used for training (Figure 3.1-2). This facility is located near the eastern edge of NAB Coronado; the pad is used for a wide-range of activities, including as a staging area for helicopter casts, special patrol insertion/extraction, and other waterborne activities that require loading/unloading personnel or equipment. Operational facilities are primarily concentrated along the north bayside area of NAB Coronado. This area includes 21 permanent berthing piers for the watercraft used for amphibious training, such as landing craft, high-speed patrol boats (Mark Vs), training barges, causeways and warping tugs. In addition, the piers serve as an area for limited training activities, including practice dives, boat maneuvers, and docking.

### SSTC-N Oceanside Training Beaches

SSTC-N oceanside training beaches are located west of SR-75 to the south of NAB Coronado. The majority of amphibious training at SSTC-N is conducted at these beaches. The oceanside training beaches are divided into five colored training areas (Yellow, Red, Green, Blue, and Orange), each consisting of two 500-yard-wide beach lanes (Yellow 1 and 2, Red 1 and 2, Green 1 and 2, Blue 1 and 2, Orange 1 and 2). These beach lanes each have a corresponding boat lane labeled 1-10. The training beaches are undeveloped with the exception of several training facilities. Public access to the beach is controlled by a guard posted on the northern edge of Yellow 1. The southern half of Yellow Beach (Yellow 2) includes an obstacle course, a helicopter mockup, a causeway staging area, rappelling facilities, and surf towers.

The excavated area surrounded by a chain-link fence, which is located on a small portion of both Green Beach and Blue Beach was previously used as a demolition pit; currently, use of this area is limited to blasting caps and pyrotechnic ordnance during the last day of training for Basic Underwater Demolition/Sea, Air, and Land (SEAL) (BUD/S) students. For this last day of training, the dirt/sand pit is filled with ocean water—water pumped into the pit via a hose above the crest, which then percolates through the sand. Blasting caps and pyrotechnics are used for training enhancement while BUD/S students perform activities in the water.

Training access to the SSTC-N oceanside training beaches is provided either from SR-75 or NAB Coronado oceanside. A hard-pack sand roadway, parallel to SR-75, runs along the beach and provides a consistent vehicular connection to the training beaches. This sand path is also available through Gate 2 (oceanside) and south along Frontage Road to Yellow Beach. Two crossing lanes have been established from the hard-pack sand roadway to the tidal zones: one between boat/beach lanes Blue 8 and Orange 9 and another to the south of boat/beach lane Orange 10. These lanes provide beach training access with limited interference with nesting areas.

### SSTC-N Bayside Training Areas

Bayside training areas used for Navy training include Delta North and South beaches located south of the SSTC-N piers; the Delta I, II, and III bay training areas located directly off the Delta North and South beaches; and the beach and bay training areas of Alpha, Bravo, and Charlie located adjacent to Navy housing north of Fiddler's Cove (Figure 3.1-2). Four other training areas are also located in San Diego Bay (Echo, Foxtrot, Golf, and Hotel). On SSTC-N bayside, a fence parallel to Silver Strand Boulevard from the Rendova housing area to Fiddler's Cove prevents public access from the land to bayside training areas. Vehicular access to Bravo Beach is available through the military family housing area or directly from SR-75 along a road north of the state park.

### 3.1.1.5 Existing Land Use at SSTC-S

#### 3.1.1.5.1 SSTC-S Overview

SSTC-S is located at the southern end of the Silver Strand peninsula. It is bounded on the north by SSNP, on the south and southeast by the City of Imperial Beach, and on the east by a United States Fish and Wildlife (USFWS) National Wildlife Refuge (NWR) (Figure 3.1-3). SSTC-S is separated from SSTC-N by SSSB and SSNP, the Loews Coronado Bay Resort, and the Coronado Cays residential development.

SSTC-S comprises about 548 acres of land that is held in fee-simple by the Navy and is surrounded by a variety of land uses. SSTC-S is owned by the federal government down to the mean high tide line (Figure 3.1-3). The YMCA Camp Surf is located within a fenced area at the border of the City of Imperial Beach and is leased by the Navy to the YMCA. SR-75 divides SSTC-S into oceanside and bayside portions (Figure 3.1-3).

#### 3.1.1.5.2 SSTC-S Surrounding Land Use

#### City of Imperial Beach

Land use bordering SSTC-S to the south within the City of Imperial Beach is zoned single-family residential, public facility, urban reserve, and seacoast commercial zoning. Land uses immediately south of SSTC-S are predominantly residential. There are two schools located within the immediate vicinity of SSTC-S: West View Elementary located approximately 0.06 mile from the southern boundary and Bayside Elementary located approximately 0.5 mile from the eastern boundary (Figure 3.1-3).

The beachfront of the City of Imperial Beach is one of the city's best recreational assets and is used by the local population, and many inland communities because of the proximity of the beach to neighboring cities. The city jurisdictional border to the north is identified by a demarcation sign at the SSTC-S border which clarifies the public access to be below the mean high tide line on SSTC-S.

#### San Diego Bay

To the east of SSTC-S is the southernmost part of San Diego Bay. San Diego Bay has natural salt marshes, and the salt ponds are part of a 130-year-old ecosystem. There are two refuge units within the USFWS NWR, the Sweetwater Marsh Unit and the South San Diego Bay Unit. The Sweetwater Marsh Unit is 316 acres located on the eastern edge of the San Diego Bay adjacent to the cities of San Diego, National City, and Chula Vista (Figure 3.1-1). The South San Diego Bay Unit consists of about 2,300 acres, 800 hundred acres of which are leased to the USFWS by the California State Lands Commission to protect several species of threatened and endangered birds that live and feed in the salt ponds. The San Diego Bay Unit includes portions of the open bay, active solar salt evaporation ponds (Salt Works), and the western end of the Otay River drainage basin (referred to as the Otay River floodplain) (Figure 3.1-1). Most of what remains of San Diego Bay's historic coastal salt marsh and intertidal mudflat habitat is preserved within these two refuge units (USFWS 2006).

#### 3.1.1.5.3 SSTC-S On-site Land Use

The SSTC-S property is divided into three distinct districts: SSTC-S Operational and Support Area, YMCA Camp Surf, and the SR-75 and Ecological Preserve area. Formerly, these areas were used to operate the facilities and systems necessary to provide communications support for the Navy and Defense Communications System. Formerly known as the NRRF, SSTC-S is the site of the Wullenweber antenna array. The majority of land on SSTC-S was operationally constrained and restricted from public use due to activities associated with the antenna; however, the antenna is no longer in use. Land uses on SSTC-S include supply/storage functions (near Bunkers 99 and 100); military recreation facilities including an athletic field, playing courts, showers, a clubhouse, and picnic facilities (located near

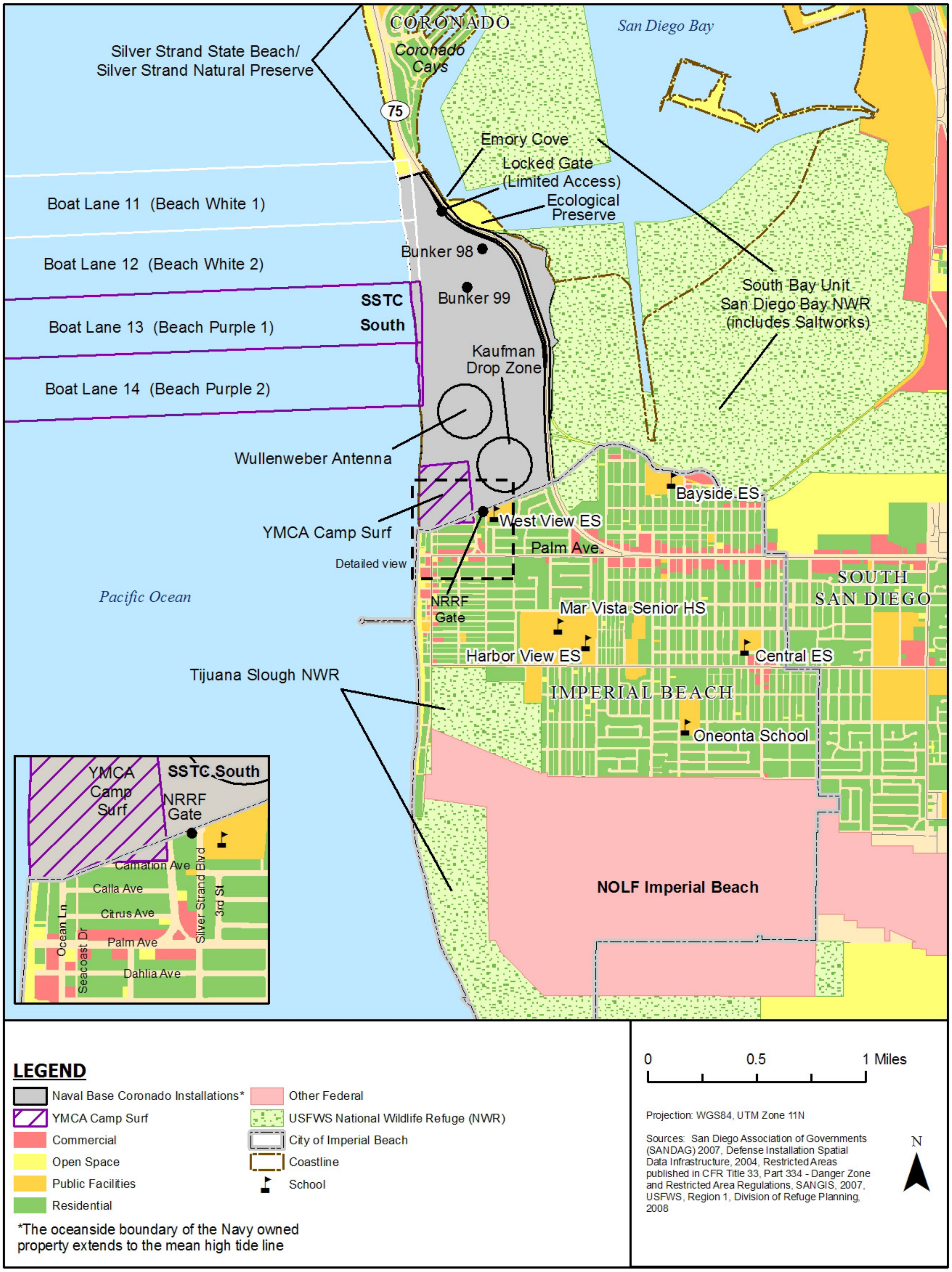


**Figure 3.1-3: SSTC-S Land Use**

Bunkers 98 and 99); and four, former military family housing units (located along the southern boundary) that are now used for administrative purposes.

#### 3.1.1.5.4 SSTC-S Oceanside Training Beaches

SSTC-S oceanside training beaches are located west of SR-75 and south of SSSB/SSNP. The oceanside training beaches are divided into two training beaches (White and Purple), each consisting of two 500-yard-wide beach lanes (White 1 and 2, Purple 1 and 2). These beach lanes each have a corresponding boat lane labeled 11-14 that are owned by the Navy down to the mean high tide line (Figure 3.1-3). Training access to these beaches is provided through the main gate to SSTC-S at Silver Strand Blvd. Due to a geographic mapping error, the northern boundary of SSTC-S appears north of its correct termination point at the south end of Silver Strand State Beach. The Navy is working with NOAA to correct this error. No Navy training occurs along Silver Strand State Beach.

#### SSTC-S Bayside

Navy training on the bayside of SSTC-S is limited because of a fence that restricts access from the highway. Emory Cove is used to launch small crafts; however, vessels are launched and remain within the bayside training areas at SSTC-N (Figure 3.1-3).

#### SSTC-S Inland

Training areas located within the fence line of SSTC-S are accessed through the Silver Strand Gate, off of Palm Avenue in Imperial Beach. Various training activities occur within the bunkers located to the north of the decommissioned Wullenweber. Parachute activities occur to the east of the Wullenweber antenna array at the Kaufman parachute drop zone, located to the southeast (Figure 3.1-3).

### 3.1.1.6 NASNI (Breakers Beach to Zuniga Jetty)

NASNI is located adjacent to, and borders, the western edge of the City of Coronado. The NASNI training area is under federal ownership and includes the beaches and nearshore waters from Breaker’s Beach to Zuniga Jetty (Figure 3.1-2). Only the nearshore areas around southern NASNI, the Zuniga Jetty, and Breaker’s Beach are being analyzed in this EIS.

### 3.1.1.7 Recreation

Recreation facilities are defined as those amenities that provide for rest, activity, education, or other opportunities for leisure services and community support that lead to an enhanced quality of life. These include nature preserves, parks, parkways, beaches, playgrounds, and community gardens. Outdoor recreation involves programs, activities, or opportunities dependent upon the natural environment. Examples include fishing, picnicking, surfing, bird-watching, hiking and interpretive trails, and camping areas. Many outdoor recreational opportunities are available in the SSTC ROI (Table 3.1-1).

**Table 3.1-1: Recreational Areas near SSTC**

| Recreational Area | Description |
|---|---|
| **Gator Beach** | Gator Beach is the recreational beach used by military personnel and their families at SSTC-N and is not open to the public. This beach is located on the northernmost oceanside portion of SSTC-N. Gator Beach functions as a buffer between the amphibious training activities to the south and the nonmilitary residential development to the north. Facilities at this beach include restrooms, cabanas, barbecue grills, and a children’s playground**.** |

**Table 3.1-1: Recreational Areas near SSTC (Continued)**

| Recreational Area | Description |
|---|---|
| **Fiddler's Cove** | A recreational marina and RV campground, known as Fiddler's Cove, is located on the bayside immediately south of the Delta Beach South and is operated by the Navy. This marina contains 500 boat (power and sail) slips, mooring points, a boat ramp, boat repair facilities, office space, classrooms, and rental facilities. In addition, up to 40 small catamarans can be beached on the north beach of Fiddler's Cove. The RV park contains 50 hard-stand camper spaces with electrical hookups. These facilities are open to active duty, retirees, DoD civilians, and sponsored civilian guests. |
| **Silver Strand State Beach and Natural Preserve** | Just south of the enlisted family housing complex on the bayside of SSTC-N is a 40-acre parcel leased to the State of California Department of Parks and Recreation for use as an interpretive trail system and campground. Further south of this parcel, on the oceanside, is SSSB. The State Beach has 2.5 miles of ocean frontage and 0.5 mile of frontage on the San Diego Bay. The entrance to the park is from SR-75, which serves as a divider between the oceanside of the park and the bayside. Park facilities include four large parking lots that can accommodate up to 1,000 vehicles, restrooms and cold showers, and fire rings for cookouts. To the south of the parking areas is SSNP which is a one and a half mile stretch of preservation land. Actions within the SSNP are limited (no motor vehicles, motorboats, or aircraft are allowed within the boundaries of a natural preserve [14 California Code of Regulations Section 4351]). |
| **YMCA Camp Surf** | The YMCA operates a youth camp on 80 acres at the southwest corner of SSTC-S on land leased from the Navy, including a portion of the oceanside beach. The camp is operated from mid March to early November and services an average of 9,000 youths and adults during that timeframe. The camp includes 9 cabins, 5 platform tents, and other tent set up areas with a total of 252 bunks. There is also a beach camping area that can accommodate up to 250 people. |
| **Ecological Preserve** | A portion of SSTC-S property fronting San Diego Bay is bounded by the South San Diego Bay Unit of the USFWS NWR (east of S-75). The Navy has an agreement with the City of Coronado to provide public access to this area to further public education about the ecological reserve. SR-75 separates the fenced portion of SSTC-S from the salt marsh ecological preserve and salt evaporation ponds. |
| **Coronado Municipal Beach** | The Coronado Municipal Beach is located adjacent to SSTC-N. Existing facilities include the main lifeguard tower and the restroom facilities, near the intersection of Ocean Boulevard and Isabella Avenue, and the portable lifeguard towers. All of these facilities are open to the public and are accessible through the City of Coronado. |
| **San Diego Bay** | San Diego Bay is widely used for a variety of commercial and recreational activities, including commercial shipping, recreational boating, sailing, and sport fishing. There are several yacht clubs headquartered in San Diego Bay in addition to a large number of public and private marinas. Formal sailboat regattas and informal racing are conducted throughout the San Diego Bay and in the ocean year-round, including the waters surrounding SSTC-N and SSTC-S. |
| **Pacific Ocean** | The Pacific Ocean is widely used for a variety of commercial and recreational activities include boating, sailing, surfing, and sport fishing. Activities originate from San Diego Bay, Coronado Municipal Beach, Silver Strand State Beach, and Imperial Beach. Commercial and recreational activities often transit along the SSTC-N and SSTC-S boat lanes. |

**Table 3.1-1: Recreational Areas near SSTC (Continued)**

| Recreational Area | Description |
|---|---|
| **Bayshore Bike Route** | The San Diego Bay Bike Route is a 25-mile bike trail. To begin, cyclists can take the passenger and bicycle ferry across to Coronado from Harbor Drive or may begin anywhere along the route. Most of the path runs along Coronado bike lanes or separated bike paths. A 9-mile stretch along the south and west sides of San Diego Bay (Silver Strand) follows the former Coronado Branch of the San Diego and Arizona Eastern Railroad. The rails are still visible in some places and allow for scenic views of San Diego along the Silver Strand. |
| **Imperial Beach** | The City of Imperial Beach, located south of SSTC-S, is responsible for the beachfront from its city limit south to the Tijuana Slough NWR. The beach is designated as a public facility, and ownership of the beaches is retained by the public. Within the Coastal Zone of Imperial Beach several routes are designated as bicycle routes. |

#### 3.1.1.8 Current Mitigation Measures

There are no mitigation measures implemented to minimize impacts specific to land use in the SSTC ROI. However, the Navy strives to be a good neighbor to the community by maintaining, to the greatest extent practicable, land use compatibility with the surrounding neighborhood and providing public access whenever possible. The Navy recognizes the importance of public access and works with the community to ensure access to the public beach areas. Further, there are mitigation measures in place for other resources that apply to land use on SSTC, mainly through the stipulation of training parameters (e.g., Acoustic Environment [Section 3.6], Biological Resources [Sections 3.7-3.12], and Public Health and Safety [Section 3.16]).

### 3.1.2 Environmental Consequences

This resource section focuses on groups of training activities that have the potential to result in an impact to land use. Similar types of activities are grouped together in the discussion to facilitate the impacts analysis. Types of activities that could affect land use include air, beach, inland, San Diego Bay, and ocean activities. These activity groupings identified in Chapter 2 and analyzed in this section consist of four activity groups:

- Air Activities: 4, 6, 7, 12, 16, 25, 26, 28, 29, 30, 32, 35, 37, 64, 66 (Table 2-1), and N4-N8 (Table 2-2);
- Beach Activities: 5, 15-18, 20, 24-30, 32, 33, 36, 38-48, 50-53, 56-60, 64, 67-77 (Table 2-1) and N10 (Table 2-2);
- Inland Activities: 31 and 64 (Table 2-1); and
- San Diego Bay and Ocean Activities: 4-7, 10-12, 15, 16, 18, 20, 25-28, 35, 37-42, 44-46, 50-53, 56-57, 67, 70, 71 (Table 2-1), N2, N4-N7, and N9 (Table 2-2).

Activities that do not have the potential to affect land use include the following: Activities 1-3, 8-9, 13-14, 19, 21-23, 34, 49, 54-55, 61-63, 65, 78 (Table 2-1) and N1, N3, N11 (Table 2-2). These activities are not discussed further within this section.

### 3.1.2.1 Approach to Analysis

Factors considered in assessing significance include the extent or degree to which implementation of an alternative would cause substantial change to currently approved or proposed land use regulations. The analysis of land use concerns are centered on the potential exclusion of public access to the public beaches of SSTC-S (below the high tide line) and the public land adjacent to Navy training areas. Further, since certain sound levels can create land use incompatibilities or be inconsistent with local land uses, the effects of ordnance- and aircraft-generated sound are addressed in Section 3.6 (Acoustic Environment) as it relates to the location of sensitive noise receptors.

### 3.1.2.2 No Action Alternative

#### 3.1.2.2.1 Air Activities

Both military and nonmilitary entities have been conducting aircraft activities in the area for well over 60 years. The San Diego International Airport is located just five miles north of SSTC. Military aviation activities conducted within the SSTC include activities 4, 6, 7, 12, 16, 25, 26, 28, 29, 30, 35, 66 (Table 2-2).

Under the No Action Alternative, aircraft activities would continue to result in overflights of public land adjacent to SSTC. Aircraft are required to approach and depart from the training beaches over the water, so an estimated 80 percent of their flight occurs over the water. Aircraft overflights associated with the No Action Alternative would not directly change the ownership, land use, management, recreation or visual setting of the area beneath it. Aircraft activities occur over communities already subjected to these types of activities. Sound associated with aircraft activities, as well as compatibility of sound levels with existing and proposed land use and sensitive noise receptors, is addressed in Section 3.6 (Acoustic Environment).

#### 3.1.2.2.2 Beach Activities

Beach training activities are conducted within areas currently designated for military training use. Activities that would restrict public access to public beaches (below the high tide line at SSTC-S) include 5, 15-18, 20, 24-30, 32, 33, 36, 38-48, 50-53, 56-59, 64, and 67-77 (Table 2-1). Since these activities are consistent with established land uses, ongoing training activities have no impact on current land uses within the installation. Some training activities are conducted outside SSTC and NASNI boundaries. For land use purposes these include training activities 16, 24, 38, 44, 57, 60, 68, 70-73, and 77 (Table 2-1). Types of training outside the installation boundary include activities such as rock portage, anchoring, insertion of personnel into the water, and transfer of personnel in the water between vessels and can occur at the Coronado Rock Jetty, outside the SSTC-S fence line, and in the San Diego Bay waters around NASNI. No Navy training occurs along SSSB/SSNP. Since activities conducted outside SSTC and NASNI boundaries do not result in land use conflicts and do not interfere with public recreation or access to the beach, they have no impact on current land use. Sound associated with beach activities (Amphibious Training and Munitions) as well as compatibility of noise levels is addressed in Section 3.6 (Acoustic Environment).

At SSTC-N, public access is currently restricted on SSTC-N beach areas from Coronado Municipal Beach to the north and SSSB/SSNP to the south. As discussed above, the Navy leases the oceanside beaches and nearshore waters on SSTC-N, and a fence that runs parallel to SR-75 precludes public access on the bayside.

At SSTC-S, the Navy owns the oceanside beach down to the mean high tide line and precludes public access to the beach training lanes (White 1 and 2 and Purple 1 and 2), above the mean high tide line. Activities listed above may require one or more beach lanes to be restricted to public access below the mean high tide line. While these activities are being conducted, safety personnel are stationed as a buffer to keep nonparticipants from harm and to ensure mission security. Civilians will be restricted from the training area to ensure safety while these activities are being conducted. When public access to the beach below the high tide line is restricted for safety purposes, access may be restricted within one of the beach lanes for the least amount of time required to safely conduct the training exercise, allowing public access to other areas of the beach below the high tide line. Navy training scheduling varies depending on Fleet deployment schedules and is not limited to any days of the year. Beach access restrictions may last one to four hours; however, on average, these activities would typically require the beach to be closed for about 2 hours. One activity, the Immediate Action Drill (IAD) (Activity 59, Table 2-1) can require the beach to be closed up to eight hours. During IAD, one to two beach lanes are used for training purposes. The public would be restricted from using the beach area (to the extent of these two beach lanes); however, they would not be restricted access to other adjacent public beach areas. Therefore, the public would have ample access to the beach.

#### 3.1.2.2.3 Inland Activities

Inland training activities are conducted within areas currently designated for military training use. Since these activities are consistent with established land uses within SSTC-N, SSTC-S, and NASNI, ongoing training activities have no impact on current land use within the installation.

Sound associated with inland activities 31 and 64 (Table 2-1), as well as compatibility of sound levels, is addressed in Section 3.6 (Acoustic Environment).

#### 3.1.2.2.4 San Diego Bay and Ocean Activities

Under the No Action Alternative, activities that require ocean or San Diego Bay access restrictions include 4-7, 10-12, 15, 16, 18, 20, 25-28, 35, 37-42, 44-46, 50-53, 56-57, 67, 70, and 71 (Table 2-1). Clearance requirements for these activities range from less than an acre to up to 18 acres. Military use of the ocean area off SSTC, NASNI, and the San Diego Bay area is compatible with civilian use. When naval vessels are conducting activities that are not compatible with other uses, they are confined to an operating area with specific clearance requirements that do not preclude free flowing commercial or recreational boating traffic within the offshore and San Diego Bay area. In addition, training activities in the nearshore areas off of SSTC-N and SSTC-S are delayed or moved if the range cannot be cleared of nonparticipating vessels and individuals and clearance is required for public safety or mission security.

### 3.1.2.3 Alternative 1 (Preferred Alternative)

Implementation of Alternative 1 would increase the training tempo from 3,926 activities to 5,343 activities annually. Implementation of Alternative 1 would also include the introduction of new types of training, conducting existing routine training at additional locations within SSTC established training areas, and increasing training access to and availability of existing beach and inland training areas.

#### 3.1.2.3.1 Air Activities

Under Alternative 1, air activities would continue to use existing approach and departure corridors from the training beaches over the water. In addition to an increase in the No Action tempo, activities N4, N5, N6, N7, and N8 (Table 2-2) are proposed to be conducted under Alternative 1. The latter activity (N8, Tactical Recovery of Aircraft and Personnel) would involve landing or hovering of helicopters at SSTC-S, at nighttime. The other activities (Activities N4-N7) would involve the transit of helicopters offshore from NASNI to SSTC boat training lanes but the craft would not land within the training complex nor hover over land.

Under Alternative 1, existing aircraft activities would continue to result in overflights of public land adjacent to SSTC. New aircraft overflights associated with Alternative 1 would not directly change the ownership, land use, management, recreation, or visual setting of the area beneath it. Aircraft activities would continue to occur over communities already subjected to these types of activities. The Amphibious Raid exercise (Activity 25, Table 2-1) would continue to represent the most intense aircraft event at SSTC (increase from 2 to 18 events per year). Sound associated with aircraft activities as well as compatibility of noise levels is addressed in Section 3.6 (Acoustic Environment).

#### 3.1.2.3.2 Beach Activities

Implementation of Alternative 1 would increase training tempo and introduce new activities to the SSTC beaches (N2, N8, N10, and N11 [Table 2-2]). Training activities would continue to be conducted within areas currently designated for military training use and within areas outside SSTC and NASNI as described under the No Action Alternative. Since these activities would be consistent with established land uses, proposed training activities would have no impact on current land use. Sound associated with beach activities (Amphibious Training and Munitions) as well as sensitive noise receptors and compatibility of noise levels is addressed in Section 3.6 (Acoustic Environment).

Under Alternative 1, the increase in training tempo would result in an associated increase in beach closures at SSTC-S. Under Alternative 1, the Navy would continue existing safety protocols to keep nonparticipants from harm and to ensure mission security (as discussed under the No Action Alternative). For public safety purposes, the Navy would continue to restrict public access to the beach at SSTC-N out to 500 yards offshore and to SSTC-S (above and below the mean high tide line). Under Alternative 1, the Navy would not preclude the public to access the public beach adjacent to the training areas. At SSTC-S, public access above the mean high tide line on Navy-owned land would continue to be restricted. The Navy would also continue to restrict public access below the mean high tide line in the training lanes during some training activities for public safety or mission security reasons (Activities 16-18, 20, 24-30, 32, 33, 36, 38-41, 43-48, 50-53, 56-59, 64, and 68-77 [Table 2-1]). Because of inherent scheduling flexibility, the actual number of times the beach is restricted at SSTC-S is variable, as activities can be scheduled at SSTC-N as well as NASNI. Under Alternative 1, Activities N9 and N11 would require public access restrictions below the mean high tide line. As described under the No Action Alternative, the IAD (Activity 59, Table 2-1) can require the beach to be closed up to eight hours. During IAD, one to two beach lanes are used for training purposes. The public would be restricted from using the beach area (to the extent of these two beach lanes); however, they would not be restricted access to other adjacent public beach areas.

#### 3.1.2.3.3 Inland Activities

Under Alternative 1, inland training activities would continue to be conducted within areas currently designated for military training use. Since these activities are consistent with established land uses within SSTC-N, SSTC-S, and NASNI, proposed increases in training activities would have no impact on current land use within the installation.

Under Alternative 1, Breacher Training (Activity 31, Table 2-1), would be conducted at Bunker 98 and interior and exterior of Bunker 99. All buildings are located within the fenced boundaries of SSTC-S. Sound associated with training activities as well as sensitive noise receptors and compatibility of noise levels is addressed in Section 3.6 (Acoustic Environment). Public access to public land (e.g., below the high tide line) would not be restricted during breacher training.

#### 3.1.2.3.4 San Diego Bay and Ocean Activities

Under Alternative 1, activities that require ocean or San Diego Bay access restrictions and clearance requirements would be the same as those described under the No Action Alternative. Military use of the ocean area off SSTC, NASNI, and the San Diego Bay area is compatible with civilian use. When naval vessels are conducting activities that are not compatible with other uses, they would continue to be confined to an operating area with specific clearance requirements that would still allow free flowing commercial or recreational boating traffic within the offshore and San Diego Bay area. In addition, training activities in the nearshore areas off of SSTC-N and SSTC-S would continue to be delayed or moved if the range cannot be cleared of nonparticipating vessels and individuals and clearance is required for public safety or mission security purposes.

#### 3.1.2.4 Alternative 2

Implementation of Alternative 2 would increase the training tempo from 3,926 activities to 5,343 activities annually. Implementation of Alternative 2 would also include the introduction of new types of training, conducting existing routine training at additional locations within SSTC established training areas, and increasing training access to and availability of existing beach and inland training areas. The only differences between Alternative 1 and 2 is that, under Alternative 2, training tempo would increase and all SSTC-N oceanside beach training areas would be available for Navy training regardless of time of year. Despite the increase in training tempo, training activities would continue to be compatible with on-site and surrounding land use and recreational resources. The change in the availability of the SSTC-N beach lanes for training purposes would not alter land use, as the beach lanes are currently and would continue to be used for military training. Impacts regarding public beach access would be the same as those described under Alternative 1.

### 3.1.3 Proposed Mitigation Measures

No mitigation measures are warranted. Mitigation measures in place for other resources (e.g., Acoustic Environment, Biological Resources, Public Health and Safety), which affect land use on SSTC, would continue to be implemented.

### 3.1.4 Unavoidable Adverse Environmental Effects

There are no unavoidable adverse environmental effects to land use as a result of implementation of any of the alternatives.

### 3.1.5 Summary of Effects

Table 3.1-2 summarizes the effects and mitigation measures for the No Action Alternative, Alternative 1, and Alternative 2.

The Navy has completed the CZMA Federal Consistency Process for the SSTC EIS proposed action. The Navy submitted a Consistency Determination to the California Coastal Commission. The CD determined that the proposed activities are consistent to the maximum extent practicable with the applicable enforceable policies of the CA Coastal Act and the CA Coastal Management Program. The Coastal Commission provided a conditional concurrence for the proposed activities on August 17, 2010. In accordance with the CZMA Federal Consistency regulations, the Navy provided a final response to the Coastal Commission on November 23, 2010. The Navy determined that the conditions of concurrence proposed by the California Coastal Commission are not necessary for the proposed activities to be consistent to the maximum extent practicable with the applicable enforceable policies of the California Coastal Management Program (CCMP) as the Navy's proposed activities are consistent to the maximum extent practicable with the CCMP.

Chapter 6 provides a full description of the CZMA process and Appendix G provides a list of the SSTC CZMA documentation. Agency correspondence and supporting documentation can be found on the SSTC EIS website at www.silverstrandtrainingcomplexeis.com.

**Table 3.1-2: Summary of Effects**

| Alternative | Effects |
|---|---|
| **No Action Alternative** | • Current Navy activities include long-established military land uses, and the Navy allows the public access to the public beaches adjacent to active training areas. Therefore, public would have ample access to the beach. |
| **Alternative 1** | • Alternative 1 would include activities that are consistent with long-established military land uses and the Navy allows the public access to public beaches adjacent to active training areas. Use of training areas would increase under Alternative 1. |
| **Alternative 2** | • The effects of Alternative 2 on land use would be similar to the effects described under Alternative 1. The Navy allows the public access to public beaches adjacent to active training areas. |
| **Mitigation Measures** | • There are mitigation measures in place for other resources (e.g., Acoustic Environment [Section 3.6], Biological Resources [Sections 3.7-3.12], Public Health and Safety [Section 3.16]) that also apply to land use on SSTC, mainly through the stipulation of training parameters. |

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# 3.2 Geology and Soils

# 3.2 GEOLOGY AND SOILS

## 3.2.1 Affected Environment

### 3.2.1.1 Introduction

#### 3.2.1.1.1 Definition

Topographic characteristics, geologic formations, soil conditions and erosion potential, and seismic and faulting conditions, in addition to landslide and liquefaction potential, are discussed in this section. The geologic resources of an area consist of its soil and bedrock materials. This includes sediments and rock outcroppings in the onshore and nearshore environments. For the purposes of this Environmental Impact Statement (EIS), the terms soil and rock refer to unconsolidated and consolidated materials, respectively.

#### 3.2.1.1.2 Regional Setting

Silver Strand Training Complex (SSTC) is located in Southern California, a region noted for its intense seismic activity. The action area is located on the coastal plain that occupies the western portion of the Peninsular Ranges Geomorphic Province. The coastal plain consists of numerous marine and nonmarine terraces of sedimentary rocks dissected by stream valleys. Most of the soils within the coastal terraces are comprised of sandy loams, clay loams, and clays. At the base of the western mountain slopes, the soils are generally well-drained sandy loams or silt loams over decomposed granitic or meta-volcanic rock (Pryde 1992).

#### 3.2.1.1.3 Region of Influence

The Region of Influence for the alternatives addressed in this EIS includes the topography, geology, soils, and seismic hazards of SSTC and the southern beaches and nearshore waters of Naval Air Station North Island (NASNI).

### 3.2.1.2 Terrestrial Geology and Topography

#### 3.2.1.2.1 Topography

The topography of the lands around San Diego Bay is characterized by gently sloping ground at an average elevation of about 10 feet above mean sea level (msl). Silver Strand peninsula, which lies between San Diego Bay and the Pacific Ocean, is generally level, with slopes typically between 1 and 5 percent. The average elevation of Silver Strand peninsula, including SSTC-North (SSTC-N), is also about 10 feet above msl, and the elevation rarely exceeds 15 feet above msl (Department of the Navy [DoN] 1989).

SSTC-South (SSTC-S) slopes gently from about 35 feet above msl at its northern end to about 10 feet above msl at its southern end. Most of SSTC-S lies on a plateau at an elevation of about 30 feet above msl, from which the terrain slopes gradually down toward the Pacific Ocean to the west and toward the tidelands of San Diego Bay to the east. A few small depressions on SSTC-S form seasonal pools and waterfowl habitats during the winter.

#### 3.2.1.2.2 Geology

SSTC is underlain by the Quaternary-age Bay Point Formation and surficial deposits of natural beach sands and dredge fill soils. The Bay Point Formation is composed of marine, lagoonal, and nonmarine sources of poorly consolidated fine- and medium-grained, pale brown, fossiliferous sandstone (United States Department of Agriculture [USDA] 1973). Beach deposits are composed of unconsolidated sand and silt derived from many sources as a result of longshore drifts and alluvial discharges from major stream courses. No artificial fill soils are located on SSTC-S.

#### 3.2.1.2.3 Soils

Soil types on the Silver Strand peninsula vary by location. North Island is mapped as primarily Marina Loamy Coarse Sand (USDA 1973). The southeastern portion of North Island abutting the City of Coronado is mapped as filled soils. Soils on Breakers Beach and Zuniga Point are mapped as Coastal Beach (Table 3.2-1).

**Table 3.2-1: Soils on Silver Strand Training Complex and Portions of Naval Air Station North Island**

| Soil Type | Training Areas | Soil Characteristics |
|---|---|---|
| Marina Loamy Coarse Sand (MIC) | SSTC-N, SSTC-S | Medium grain, with low shrink-swell potential, 2-9 percent slope, 0.6-20.0 permeability (inches/hour), depth >5 feet, severe erodability potential. Mean annual precipitation 12-14 inches. Mean annual air temperature 60-62 degrees Fahrenheit (°F). |
| Huerhuero Loam (HrC) | SSTC-S | Very fine grain, with high shrink-swell potential, 2-9 percent slope, 0.6-2.0 permeability (inches/ hour), depth >5 feet, severe erodability potential. Mean annual precipitation 10-12 inches. Mean annual air temperature 60-62°F. |
| Huerhuero Urban (HuC) | none | |
| Coastal Beach (Cr) | NASNI (beaches), SSTC-N, SSTC-S | Low shrink-swell potential, severe erodability potential. Partially, regularly covered by water. No vegetation. Mean annual precipitation 12-14 inches. Mean annual air temperature 60-62°F. |
| Tidal Flats (Tf) | SSTC-N | Level, barren, saline soils inundated daily by tidal waters. Higher elevations may support sparse salt-tolerant vegetation. Texture ranges from very fine sand to clay. High shrink-swell potential, severe erodability potential |
| Made Lands (Md) | none | Variable – depends upon source of fill materials |

Source: USDA 1973.

Soils on the bayside portion of SSTC-N are mostly hydraulic fill (Figure 3.2-1). These soils are composed of loose to moderately dense, silty, fine- to medium-grained sand with gravel and shell, and become saturated at a depth of about 26 feet below grade (DoN 1992). This fill is underlain by Bay Point Formation deposits.

Soils on the southern bayside portion of SSTC-N consist of Marina Loamy Coarse Sand. These soils are very deep, excessively drained, loamy coarse sands to loamy sands that occur on beach ridges. These soils have a high infiltration rate, a slow to medium runoff rate, and a severe erosion potential. The topsoil is loamy coarse sand to loamy sand, ranging from 6 to 14 inches thick. The subsoil is loamy coarse sand to loamy sand 27 to 47 inches thick (USDA 1973).

Soils on the bayside portion of SSTC-S include Marina Loamy Coarse Sand and Huerhuero Loam (Figure 3.2-2). These soils have low to medium fertility, a slow permeability rate, a slow to medium runoff rate, and a severe erodability potential. The topsoil is sandy loam to loam 5 to 30 inches thick. The subsoil is clay, to clay loam, to sandy loam, 45 to 67 inches thick (USDA 1973).

The oceanside portions of SSTC-N and SSTC-S are mapped as Coastal Beaches, sandy and gravelly areas along the open shoreline of the Pacific Ocean. Beach soils sampled on Silver Strand by the U.S.


**Figure 3.2-1: SSTC-North Soil Composition**


**Figure 3.2-2: SSTC-South Soil Composition**

Army Corps of Engineers (USACE) are a mixture of fine-grained silty sands and well-graded to poorly graded medium-grained sands, with a fine grains content of 1 to 5 percent (USACE 2003). Beach soils have a high infiltration rate. The rate of water transmission is also high, resulting in low runoff potential. These soils are highly erodible. The beaches are exposed to constant sea-action and coastal winds and are, therefore, subject to further erosion. The dunes along the oceanside of Silver Strand peninsula are also subject to erosion from prevailing coastal winds, surf, storm surge, and military training maneuvers.

#### 3.2.1.2.4 Geologic Hazards

The California Geological Survey (CGS) classifies faults as either active or potentially active, according to the Alquist-Priolo Special Studies Zone Act of 1972 (California Division of Mines and Geology [CDMG] 1990). CGS defines an active fault as a fault that has exhibited surface displacement within the Holocene Epoch (the last 11,000 years). A fault that has exhibited surface displacement during the Pleistocene Epoch (which began about 1.6 million years ago and ended about 11,000 years ago) is defined as potentially active. Earthquake magnitude is measured according to the Richter scale.

SSTC lies in coastal San Diego County, which is an active seismic region. Major active or potentially active faults in the San Diego area include San Jacinto and Elsinore faults located approximately 66 miles and 44 miles east of SSTC, respectively; La Nacion Fault, located approximately 7 miles east of SSTC; and Rose Canyon Fault, crossing NASNI north of SSTC-N (Figure 3.2-3). Offshore faults include Coronado Bank Fault and San Clemente Fault, located approximately 12 and 41 miles to the west in the Pacific Ocean, respectively.

There is also a north-trending pattern of secondary faults, including (from north to south) the Spanish Bight, Coronado, and Silver Strand Faults. These secondary faults are considered to be splays of the Rose Canyon Fault. Rose Canyon Fault is considered to be active by the CDMG, and could produce a maximum credible earthquake of 7.0 on the Richter Scale.

The seismic hazards most likely to be detrimental to SSTC are ground shaking and liquefaction resulting from a large earthquake generated on a major regional or locally active fault. Liquefaction is defined as the transformation of soils from a solid to a liquid state during ground shaking. Liquefaction generally requires loose, unconsolidated silts or sands at or near the groundwater table. Liquefaction can result in differential settlement of structures, damaged foundations, and downed utility lines. Portions of SSTC are located on hydraulic fill or sand, so the project area is highly susceptible to liquefaction and settlement from ground shaking during an earthquake. A major earthquake on a local fault could render SSTC unsuitable for training until liquefaction abates.

The threat of flooding by tsunami is a potential hazard because of the proximity of SSTC to the ocean. Tsunamis are long, shallow, high-velocity ocean waves that are typically generated by seismic activity. Historically, the highest recorded tsunami in San Diego County was 4.6 feet, following the 1960 Chilean earthquake (DoN 1992). An earthquake along San Clemente Fault, which shows evidence of vertical separation parallel to the coastline, could generate a tsunami along the California coast (Inman and Nordstrom 1973). Associated currents could be strong enough to damage structures in the water or along the coastline.

Seiches are surges of liquids in confined bodies of liquid, such as reservoirs or tanks. They can be caused by ground shaking during an earthquake. Such events may inundate shorelines and possibly cause some flooding. A review of relevant literature indicates that San Diego Bay is not prone to seiches.

Landslides typically occur on steep slopes in soils with high shrink-swell characteristics, such as clays. Because SSTC is relatively flat, with no major slopes, and the soils are well-drained loamy sands, landslides are not a potential hazard.

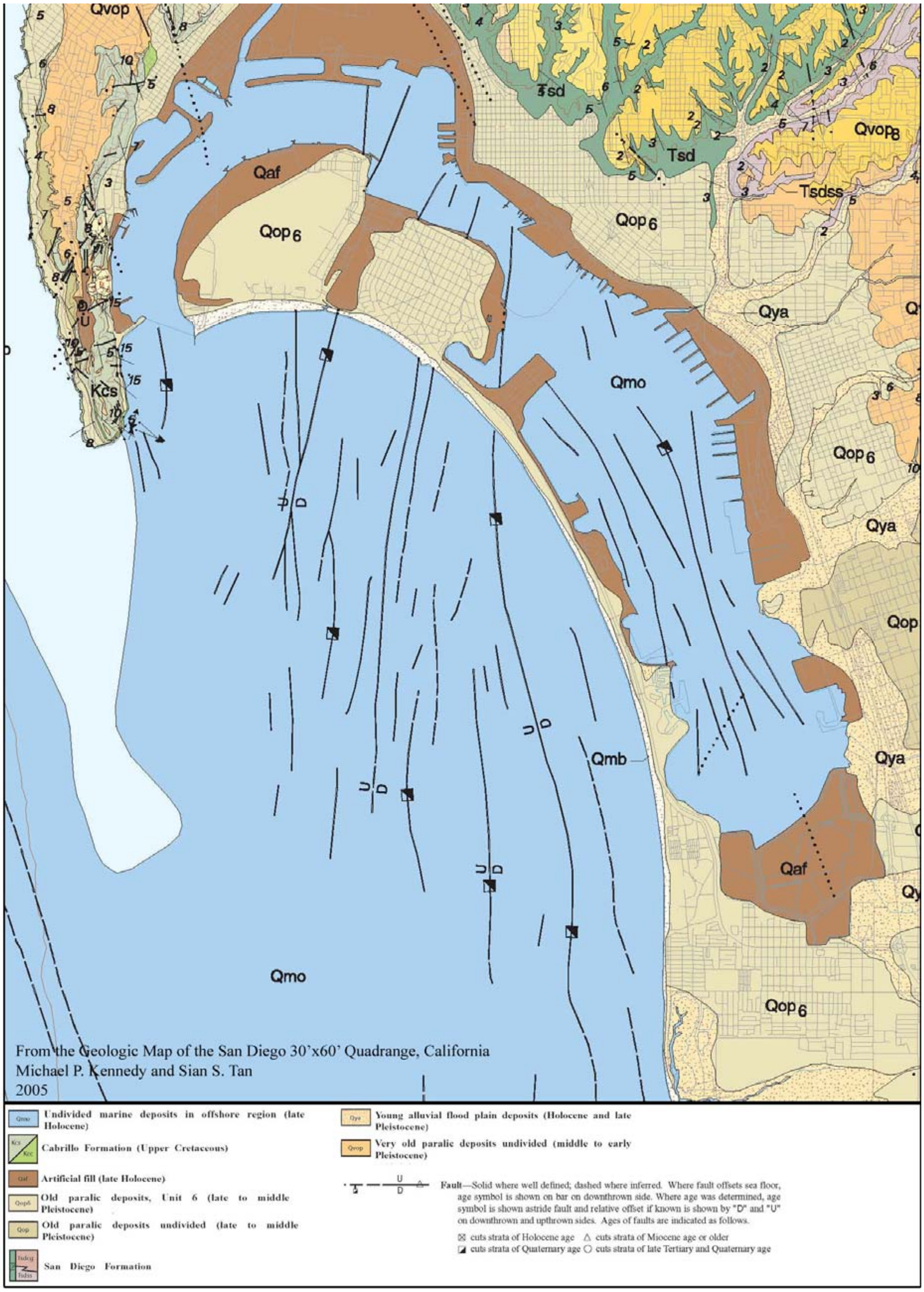


**Figure 3.2-3: Local and Regional Faults in Project Vicinity**

### 3.2.1.3 Marine Geology

#### 3.2.1.3.1 San Diego Bay

Historically, the San Diego Bay floor and margins were characterized by sand, silt, clay, mud (silt and clay less than 62 microns in diameter), and mudstone. Sands were most common at the mouth and along the western margins of San Diego Bay, while finer mud deposits characterized the eastern margins and southern extremity of San Diego Bay (Peeling 1975). According to studies in 1980 by San Diego Gas & Electric Company, the thickness of San Diego Bay floor muds averages 0 to 8 feet. The mud sits upon layers of sand and sandy-silt, which rest on older semiconsolidated sediments. The diversion of the San Diego River and the damming of the Sweetwater and Otay Rivers have reduced natural sedimentation sources into San Diego Bay.

Without human intervention, San Diego Bay may have eventually (in geologic time) filled up with sediment delivered by the San Diego, Otay, and Sweetwater Rivers. The northward drift of beach sand that connected Coronado Island with the mainland, and Coronado and North Islands together, eventually could have blocked or nearly blocked the harbor entrance. Breakwaters, channel maintenance, and tidal action prevent this process from occurring (Norris and Webb 1990).

During the century prior to the 1960s, the annual dredging rate averaged 4.3 to 6.1 million cubic yards, which is 3 to 6 times the former (background) yearly sediment input. This annual dredging rate was roughly 17 to 34 times the current yearly sediment input to San Diego Bay. The severely reduced sediment input is further confirmed by the unusually low volume of maintenance dredging conducted in interior channel areas (Smith 1976). As a result of all the above, sediment composition and distribution are highly altered from their historical conditions.

#### 3.2.1.3.2 Pacific Ocean

The marine portions of SSTC are located in Silver Strand Littoral Cell (SSLC). A littoral cell is a coastal compartment that contains a complete cycle of littoral (beach) sedimentation, including sources, transport pathways, and sinks. SSLC extends south along the coast from Point Loma in the United States to the southern end of Playas de Tijuana in Baja California Sur, Mexico. The Tijuana River Delta is a major shoreline feature within SSLC.

SSLC has been the subject of many shoreline studies since the early 1960s. Many recent reports were produced by USACE as part of the Coast of California Storm and Tidal Wave Study (Inman et al. 1986; USACE 1985, 1987). These studies reveal that the advance and retreat of the shoreline have varied greatly over the last several decades, primarily as a result of beach nourishment projects and wave erosion.

In the past, the large volume of sediment discharge from the Tijuana River ensured a continuing supply of sand and sediment entering SSTC from the south. The damming of the Tijuana River has decreased its sediment load by an estimated 70 percent, however, and beaches in Imperial Beach and Coronado are experiencing rapid erosion. Erosion is most noticeable to the south of Coronado, at Imperial Beach and Playas de Tijuana. Historical surveys and photographs reveal average annual erosion rates of about 3 feet per year (USACE 2003). The sand movement along the shoreline is predominantly toward the north, with occasional reversals. The primary sink for beach sands is a shoal off Zuniga Jetty at the entrance to San Diego Bay.

SSTC ocean shores are characterized by sand beaches, wave-cut rocky platforms, and gravel beaches. Along SSTC-S, soft-bottom habitat characterizes the ocean floor, with a short stretch of cobble bed at a depth of about 55 feet. Coarse shell debris was observed along the alignment of South Bay Ocean Outfall from about 50 to 80 feet deep, with finer sediments inshore and offshore. A study area one mile to the north and parallel to this outfall alignment indicated substantially more low-relief rocks, boulders, and cobbles from approximately 48 feet out to about 90 feet in depth (U.S. International Boundary Waters Commission 1998).

The sea floor within the region consists of soft sand and mud, hard-shale bedrock, and cobble/ boulder fields, with finer-grain clays more common in deeper water and sandy sediments along the shoreline. Hard substrate is found along the shoreline at shallow and deep rock reefs, while cobble/boulder habitats are most common near the mouths of rivers and streams. Centaur Associates (1984) found that, except in some submarine canyons, the regional sea floor habitats generally consist of mud (silts and clays) in water depths of 300 feet or more.

### 3.2.2 Current Mitigation Measures

The Navy has implemented measures to mitigate the effects of its training activities on soils:

- Sand (of a quality that is appropriate for nesting California least terns) is periodically replenished on Delta beaches when available.
- Vegetation on the back dunes of SSTC beaches is maintained to reduce water and wind erosion.
- In inland SSTC-S areas, vehicles are restricted to existing roads to minimize the loss of vegetation.

In addition, the Naval Base Coronado (NBC) Integrated Natural Resources Management Plan (INRMP) includes strategies to minimize erosion on SSTC, and the Navy works to implement these strategies.

### 3.2.3 Environmental Consequences

This resource section focuses on groups of activities that could accelerate soil erosion or loss of sediments. Geologic hazards, such as earthquakes, liquefaction, and tsunamis will affect all training activities if the event reaches sufficient magnitude. Soil erosion is a natural process occurring on all land. Erosion processes include sheet and rill erosion, gullying, and wind erosion. Accelerated soil erosion is defined as a net loss of soil due to land use.

Similar types of activities are grouped together (aggregated) for ease of analysis. Types of activities that could affect soils and sediments include intense or extensive foot traffic on sandy beaches, beach landings of large motorized vessels, large beach camps, and substantial soil (e.g., by bulldozer) or sediment (e.g., by driving piles) displacement. Activities without the potential to affect soils or sediments are air, ground, surface, and mid-column water activities, including 2-4, 6, 8, 9, 13-16, 18, 21, 23, 35, 44, 49, 54, 55, 63, 66, 70, 78, and N1, N4-N7 (Tables 2-1 and 2-2). Other activities without the potential to affect soils or sediments are anchoring (Activity 1, Table 2-1), dispersed or small-footprint foot traffic, or foot traffic on hard surfaces (16, 17, 19, 30, 36, 47, 57-64, 67, 72, and 73 [Table 2-1]), small beach camps (Activity 74, Table 2-1), beach landings by small boats (20, 22, 24, 29, 33, 34, 56 [Table 2-1]), and land training activities that do not disturb surface soils (Activities 31 and 65, Table 2-1).

#### 3.2.3.1 Approach to Analysis

Potential geologic and soil impacts are limited to elements of current and proposed activities that could affect onshore and bay/ocean bottom sediments or that could be affected by geologic hazards. Aircraft activities are not expected to affect geology or soils. Potential bay/ocean sediment contamination issues are addressed in the Water Resources impact analysis (Section 3.5).

Impacts associated with geology and soils can be direct or indirect. Direct impacts result from physical soil disturbances or topographic alterations, while indirect impacts include risks to individuals and facilities from geologic hazards. Factors considered in determining whether an impact would be significant or substantial include the potential for substantial change in soil stability and physical effects on ocean bottom sediments and natural ocean processes (e.g., sedimentation and currents).

Because the rainy season in San Diego is relatively short and the incidence of heavy rainfall events is relatively low, wind erosion is expected to account for a large portion of the overall soil transport. The extent of direct land use effects on soil erosion depends on the nature, frequency, and duration of the activity, and on the topography of the training area, the soil type, and prevailing meteorological conditions (e.g., surface wind speeds and seasonal rainfall patterns):

- Longer training activities result in more soil disturbance than shorter activities,
- Areas frequently disturbed are more prone to erosion than areas seldom disturbed,
- Sloped areas have higher erosion rates than level areas,
- Finer soils are affected more by disturbance than coarser soils,
- Erosion from surface flows of rain storm runoff occurs mostly from October to April, and
- The intensity of wind erosion of soils is related to wind speed, with noticeable entrainment of loose alluvial soils beginning at wind speeds of about 12 miles per hour.

Currently available methods and information are insufficient to fully quantify these effects; however, a qualitative analysis of training impacts on the soils of the training areas is provided.

### 3.2.3.2 No Action Alternative

#### 3.2.3.2.1 Inland Activities

Training activities under the No Action Alternative may alter erosion rates in upland areas by disturbing surface soils. Foot and vehicle travel on unpaved surfaces increase wind and water erosion of soils by reducing vegetative cover and breaking up the soil crust. The excavating, grading, and trenching of unpaved surfaces is an intentional disturbance and redistribution of these inland soils.

Under the No Action Alternative, 24 separate training activities will take place in the inland portions of SSTC-S (4, 16, 25, 26, 28-31, 47, 58-66, 69, 71-74, and 77 [Table 2-1]). On inland portions of SSTC-S, vehicles are restricted to existing roads, so they do not disturb soils. Because the site has low relief, is well vegetated, and dispersed, low-intensity training activities do not affect surface soils. Six activities could affect soils (25, 26, 68, 69, 71, and 77 [Table 2-1]).

The most intense use of SSTC-S Inland, in terms of effects on soils, is the Field Training Exercises (FTXs), which include large, multiday camps. This intensive use (roughly about one exercise per week) results in unavoidable surface disturbance and damage to or loss of vegetation. Past exercises have resulted in the loss of vegetative cover over several acres. Depending upon their timing, relative to seasonal conditions such as summer drought (when plant growth is minimal) and winter rain storms, these soil disturbances and surface hydrology alterations could accelerate natural erosion processes. However, the topography of the site,with low areas landward of a barrier of beach dunes along the western fence line, serves to contain eroded soils on-site. Thus, off-site transport of soils is expected to be negligible. Long-term use of the uplands on SSTC-S for overnight camps would not cause soils to be transported from the higher elevations of the site to the lower elevations because the area is relatively flat and vegetation on the site would retain the soils.

#### 3.2.3.2.2 Beach Activities

Training activities at SSTC affect beach sands by disturbing their surfaces and increasing their erosion potential. Some logistics activities alter surface contours directly or involve the use of special equipment (e.g., bulldozer) that has enhanced potential for disturbance. The discussion below focuses on these aspects of training.

### Foot and Vehicle Traffic

Training activities under the No Action Alternative may affect beaches directly by disturbing the surface of the ground, as discussed above for upland areas. Training activities that generate extensive foot traffic on beaches include 17, 25, 26, 32, 68, 69, 71, 72, 73, and 77 (Table 2-1). Together, these 10 SSTC training activities generate an estimated 1,350,000 person-hours of foot travel on SSTC beaches. Approximately 80 percent of this activity occurs on SSTC-S Inland, with about 13 percent occurring on SSTC-N and seven percent occurring on SSTC-S. Of the activities listed, only Hell Week activities may occur on Breakers Beach at NASNI.

The use of wheeled vehicles on beaches, especially on the wet lower portion of the beach, has no long-term effect on beach sands. Tracked heavy equipment and vehicles, such as the bulldozers used in several of the Logistics Over the Shore (Navy Tactical Task [NTA] 4.5.6) activities, have a larger footprint than wheeled vehicles. On soft ground, they compact the surface when traveling in a straight line, but create ruts and loose soil when turning. Bulldozers may be used for beach preparation, including construction of temporary sand ramps and beach access roads. They also drag and secure beach termini of logistics systems (e.g., Beach Interface Unit [BIU] of Amphibious Bulk-Liquid Transfer System [ABLTS], Beach Termination Unit [BTU] of the Offshore Petroleum Discharge System [OPDS]). Where training activities require natural beach contours to be altered, they are restored using bulldozers, to the extent practical, at the conclusion of the activity. Thus, training units ensure that heavy equipment use on SSTC beaches has no long-term effect on beach sands.

### Bulk Liquid Transfers

Under the No Action Alternative, the Navy will conduct up to 14 simulated bulk-fuel transfers (Activities 38, 39, and 50 [Table 2-1]). During such training exercises, seawater pumped through the transfer line onto the beach must be returned to the sea. Training units use a return hose to ensure that seawater discharges do not affect beach soils.

### 3.2.3.2.3 Water Activities

Existing training activities in nearshore and surf zone areas, as well as those on the wet portion of the beach, have continuing effects on bottom sediments and beach sands. Bottom sediments in the surf zone (or in shallow waters on the bayside) are stirred up by turbulence from the propellers of small, powered watercraft. Fine sediments are suspended in the water column more frequently, and for longer durations, than under natural conditions. Larger watercraft, such as Landing Craft Units (LCUs), may stir up large amounts of sand and sediment. Maneuvering and positioning powered pontoons and barges in shallow water also stirs up bottom sediments. Construction training in the San Diego Bay and ocean occurs in Causeway Pier Insertion/Extraction, Elevated Causeway (ELCAS), and OPDS training exercises. These exercises occur 19 times per year under baseline conditions. Ocean floor construction disturbs bottom sediments.

The amount of sediment disturbed may be insignificant for an individual activity; however, the aggregate effect of these periodic disturbances could be to accelerate the erosion of beach sands and enhance longshore transport of nearshore bottom sediments along the training beaches. By increasing the frequency of sediment disturbance and the length of time the sediments remain suspended in the water column, training activities in very shallow water could enhance the lateral transport of sediments to the north in the relatively strong longshore current along Silver Strand.

Under baseline conditions, approximately 10,000 small boats and amphibious vehicles and vessels per year land on SSTC beaches (Appendix C). Beach landings temporarily result in loss of beach sand and sediments. Ocean sediment transport, however, will deposit new sediment in areas disturbed by beach landings. These training activities have no long-term or widespread effects on bottom topography or sediment quality.

Underwater detonations of up to 20 pounds Net Explosive Weight (NEW) may occur on the ocean floor in conjunction with training activities. An estimated 147 bottom-laid or near-bottom underwater detonations per year occur in the waters off SSTC, which may result in a crater. Depending upon the sizes of the explosives charges and their locations in the water column, these activities could create craters in the bottom sediments up to 10 feet in diameter, for a total surface area of ($\pi * r^2 = 3.14*25 =$ ) 78.5 square feet (Naval Ordnance Laboratory 1973). These detonations at or near the bottom surface would temporarily disturb about (214*78.5 =) 16,799.5 square feet of bottom surface, or about 0.39 acre. These detonations create shallow craters and resuspend bottom sediments into the water column. Craters fill in over time, with sediments settling out of the water column or transported laterally by currents. Based on worst-case assumptions on the sizes of craters left by these detonations, the effects of these detonations are negligible.

### 3.2.3.3 Alternative 1 (Preferred Alternative)

#### 3.2.3.3.1 Inland Activities

Under Alternative 1, approximately 25 types of training would occur on the inland portions of SSTC-S. Training activities under Alternative 1 would have similar effects to those described for the No Action Alternative in Section 3.2.3.2.1. Under Alternative 1, six training activities would be a concern for soil impacts. The most intense use of SSTC-S Inland would be FTXs, as under the No Action Alternative. For the reasons discussed above and under the conditions described above for the No Action Alternative, these activities could accelerate natural erosion processes. The topography of the site, however, with low areas landward of a barrier of beach dunes along the western fence line, serves to contain eroded soils on-site. Thus, off-site transport of soils is expected to be negligible. Long-term use of the uplands on SSTC-S for overnight camps would not cause soils to be transported from the higher elevations of the site to the lower elevations because the area is relatively flat and vegetation surrounding the site would retain the soils.

#### 3.2.3.3.2 Beach Activities

Training activities at SSTC would affect beach sands and sediments by disturbing their surfaces and increasing their erosion potential. Some logistics activities would alter surface contours directly or involve the use of special equipment (e.g., bulldozer) that has enhanced potential for disturbance. The discussion below focuses on these aspects of training.

#### Foot and Vehicle Traffic

Training activities under Alternative 1 could affect beaches directly by disturbing the surface of the ground, as discussed above for upland areas. Training activities that could generate extensive foot traffic on beaches include 17, 25, 26, 32, 68, 69, 71, 72, 73, 77, N8, and N10 (Table 2-1 and Table 2-2). These 12 SSTC training activities could generate an estimated 1,390,000 person-hours of foot travel on SSTC beaches. Approximately 77 percent of this activity would occur on SSTC-S Inland, about 13 percent would occur on SSTC-N, and about 10 percent would occur on SSTC-S. Of the activities listed above, only Hell Week activities could occur on Breakers Beach at NASNI.

The use of wheeled vehicles on beaches, especially on the wet lower portion of the beach, would have no long-term effect on beach sands. Tracked heavy equipment and vehicles, such as the bulldozers used in several of the Logistics Over-the-Shore (NTA 4.5.6) activities, have a larger footprint than wheeled vehicles. On soft ground, they compact the surface when traveling in a straight line, but create ruts and loose soil when turning. Bulldozers would be used for beach preparation, including construction of temporary sand ramps and beach access roads. They also would drag and secure beach termini of logistics systems (e.g., BIU of ABLTS and BTU of the OPDS). Where training activities require natural beach contours to be altered, they would be restored using bulldozers, to the extent practical, at the conclusion of the activity. Thus, training units would ensure that heavy equipment use on SSTC beaches would have no long-term effect on beach sands.

### Bulk Liquid Transfers

Under Alternative 1, the Navy would conduct up to 15 simulated bulk-fuel transfers (Activities 38, 39, and 50 [Table 2-1]). During such training exercises, seawater pumped through the transfer line onto the beach must be returned to the sea. Standard practice for training units is to use a return hose so that the seawater discharges would not affect beach soils. During bulk-liquid transfer activities, transfer lines on the beach could be buried to secure them, which could disturb some beach soils.

### 3.2.3.3.3 Water Activities

Under Alternative 1, the increase in disturbance of surf zone beach sediments would be roughly proportional to the increase in landings of large amphibious vessels and vehicles, which would increase by about 72 percent. Underwater construction training exercises would increase 16 percent from baseline conditions. Other natural and manmade sources of disturbance along the Silver Strand would continue to affect beach sediments. Beach replenishment by the federal government would continue to be necessary for long-term maintenance of the sandy beaches, even without the increase in training activities under Alternative 1.

Under Alternative 1, over 13,100 small boats, amphibious vehicles and vessels per year could land on SSTC beaches. Beach landings would temporarily result in loss of beach sediments. But, ocean sediment transport would deposit new sediment in areas disturbed by beach landings. These training activities would have no long-term or widespread effects on bottom topography or sediment quality.

Under Alternative 1, the Expeditionary Fighting Vehicle (EFV) would replace the Amphibious Assault Vehicle (AAV). The EFV is 50 percent (10 tons) heavier than the AAV, but also is slightly longer and wider. The bearing weight of the EFV's tracks on the ground thus would be slightly greater than that of the AAV. The typical speed of the EFV during training exercises would be the same as the AAV. Up to six EFVs would participate in up to 18 Amphibious Raids (Activity 25, Table 2-1) per year. Based on this level of activity and the total distances anticipated to be traversed by the EFVs, the introduction of this new weapons platform would not affect soils or erosion potential.

Underwater detonations of up to 29 pounds NEW may occur on the ocean floor in conjunction with training activities. An estimated 297 bottom-laid or near-bottom underwater detonations per year would occur in the waters off SSTC. These detonations would resuspend bottom sediments into the water column. Depending upon the sizes of the explosives charges and their locations in the water column, these detonations could create craters in the bottom sediments up to 10 feet in diameter, for a total surface area of ($\pi*r^2 = 3.14*25 =$ ) 78.5 square feet (Naval Ordnance Laboratory 1973). These detonations could disturb up to (78.5*297 =) 23,314.5 square feet of bottom surface, or about 0.55 acre would be temporarily disturbed. Craters fill in over time, however, with sediments settling out of the water column or transported laterally by currents. Based on worst-case assumptions on the sizes of craters left by these detonations, the effects of these detonations would be negligible.

#### 3.2.3.4 Alternative 2

The only difference between Alternatives 1 and 2 is that, under Alternative 2, all SSTC-N oceanside beach training areas would be available for use, regardless of time of year. Under Alternative 2, foot and vehicle traffic would be more dispersed than under Alternative 1. Areas supporting sensitive biological resources would experience more disturbance than under the No Action Alternative or Alternative 1. These effects are addressed under Terrestrial Biological Resources (Section 3.11) and Birds (Section 3.12). In addition to surface soil disturbance, foot and vehicle traffic could compact surface soils, resulting in less infiltration and more runoff of rainfall.

### 3.2.4 Proposed Mitigation Measures

Current best management practices, in place to mitigate the effects of training activities on soils, would continue to be implemented at SSTC.

### 3.2.5 Unavoidable Adverse Environmental Effects

There are no unavoidable adverse effects on geology and soils as a result of implementation of any of the alternatives.

### 3.2.6 Summary of Effects

Table 3.2-2 summarizes the effects and mitigation measures for the No Action Alternative, Alternative 1, and Alternative 2.

**Table 3.2-2: Summary of Effects**

| Alternative | Effect |
|---|---|
| **No Action Alternative** | • Only previously disturbed land areas are affected. Soil disturbances are minor and affect only portions of the area.<br>• Sandy beaches are disturbed; however, the impacts are temporary.<br>• Ocean bottom sediments are disturbed by underwater detonations, but the areas affected are small. |
| **Alternative 1** | • Proposed training activities would be comparable in type to existing activities, but the level of activity of some activities would increase. The level of disturbance of beach and inland surfaces would incrementally increase the potential for soil erosion, but would still be minor and affect only portions of the area.<br>• Underwater detonations would affect a larger area of bottom sediments than under the No Action Alternative, but the area affected would be small. |
| **Alternative 2** | • With regard to soils and sediments, the effects of this alternative would be similar to those described for Alternative 1. Overall, the effects of Alternative 2 would be more widely dispersed and training areas formerly avoided would experience a slightly increased level of use over Alternative 1. |
| **Mitigation Measures** | • Currently, sand (of a quality that is appropriate for nesting California least terns) is periodically replenished on Delta beaches when available, vegetation on the back dunes of SSTC beaches is maintained to reduce water and wind erosion, and in inland SSTC-S areas, vehicles are restricted to existing roads to minimize the loss of vegetation.<br>• Currently, disturbed areas of beach are restored as needed with bulldozers.<br>• The NBC INRMP includes strategies to minimize erosion on SSTC and the Navy works to implement these strategies. |

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# 3.3 Air Quality

## 3.3 AIR QUALITY

### 3.3.1 Affected Environment

#### 3.3.1.1 Introduction

##### 3.3.1.1.1 Definition

Air quality is defined by ambient air concentrations of specific pollutants that have been determined to be of concern with respect to the health and welfare of the general public by the United States Environmental Protection Agency (USEPA). The USEPA has established National Ambient Air Quality Standards (NAAQS) for these pollutants. The seven major pollutants of concern, called “criteria pollutants,” are carbon monoxide (CO), sulfur dioxide ($SO_2$), nitrogen dioxide ($NO_2$), ozone ($O_3$), suspended particulate matter less than or equal to 10 microns in diameter ($PM_{10}$), fine particulate matter less than or equal to 2.5 microns in diameter ($PM_{2.5}$), and lead (Pb). Primary NAAQS are established to protect public health. Secondary NAAQS may also be established to avoid other adverse impacts to the public welfare such as odors or visibility effects. Areas that violate a federal air quality standard are designated as non-attainment areas.

Ambient air quality refers to the atmospheric concentration of a specific compound (amount of pollutants in a specified volume of air) that occurs at a particular geographic location. The ambient air quality levels measured at a particular location are determined by the interactions of emissions, meteorology, and chemistry. Emission considerations include the types, amounts, and locations of pollutants emitted into the atmosphere. Meteorological considerations include wind and precipitation patterns affecting the distribution, dilution, and removal of pollutant emissions. Chemical reactions can transform pollutant emissions into other chemical substances. Ambient air quality data are generally reported as a mass per unit volume (e.g., micrograms per cubic meter [$\mu g/m^3$] of air) or as a volume fraction (e.g., parts per million [ppm] by volume).

Pollutant emissions typically refer to the amount of pollutants or pollutant precursors introduced into the atmosphere by a source or group of sources. Pollutant emissions contribute to the ambient air concentrations of criteria pollutants, either by directly affecting the pollutant concentrations measured in the ambient air or by interacting in the atmosphere to form criteria pollutants. Primary pollutants, such as CO, $SO_2$, Pb, and some particulates, are emitted directly into the atmosphere from emission sources. Secondary pollutants, such as $O_3$, $NO_2$, and some particulates, are formed through atmospheric chemical reactions that are influenced by meteorology, ultraviolet light, and other atmospheric processes. $PM_{10}$ and $PM_{2.5}$ are generated as primary pollutants by various mechanical processes (for example, abrasion, erosion, mixing, or atomization) or combustion processes. However, fine particulate matter ($PM_{10}$ and $PM_{2.5}$) can also be formed as secondary pollutants through chemical reactions or by gaseous pollutants condensing into fine aerosols. In general, emissions that are considered “precursors” to secondary pollutants in the atmosphere (such as Reactive Organic Gases [ROG] and oxides of nitrogen [$NO_x$], which are considered precursors for $O_3$), are the pollutants for which emissions are evaluated to control the level of $O_3$ in the ambient air.

The State of California has identified four additional pollutants for ambient air quality standards: visibility reducing particles, sulfates, hydrogen sulfide, and vinyl chloride. The California Air Resources Board (CARB) has also established the more stringent California Ambient Air Quality Standards (CAAQS). Areas within California in which ambient air concentrations of a pollutant are higher than the state and/or federal standard are considered to be non-attainment for that pollutant. Table 3.3-1 details both the federal and state ambient air quality standards.

**Table 3.3-1: Ambient Air Quality Standards**

| Pollutant | Averaging Time | NAAQS[1] | | CAAQS |
|---|---|---|---|---|
| | | Primary | Secondary | Concentration |
| Ozone ($O_3$) | 1-Hour | - | Same as Primary Standard | 0.09 ppm (180 µg/m$^3$) |
| | 8-Hour | 0.075 (147 µg/m$^3$) ppm | | 0.070 ppm (137 µg/m$^3$) |
| Carbon Monoxide (CO) | 8-Hour | 9.0 ppm (10 mg/m$^3$) | None | 9.0 ppm (10 mg/m$^3$) |
| | 1-Hour | 35 ppm (40 mg/m$^3$) | | 20 ppm (23 mg/m$^3$) |
| Nitrogen Dioxide ($NO_2$) | Annual Average | 0.053 ppm (100 µg/m$^3$) | Same as Primary Standard | 0.030 ppm (56 µg/m$^3$) |
| | 1-Hour | - | | 0.18 ppm (338 µg/m$^3$) |
| Sulfur Dioxide ($SO_2$) | Annual Average | 0.03 ppm (80 µg/m$^3$) | - | - |
| | 24-Hour | 0.14 ppm (365 µg/m$^3$) | - | 0.04 ppm (105 µg/m$^3$) |
| | 3-Hour | - | 0.5 ppm (1300 µg/m$^3$) | - |
| | 1-Hour | - | - | 0.25 ppm (655 µg/m$^3$) |
| Suspended Particulate Matter ($PM_{10}$) | 24-Hour | 150 µg/m$^3$ | Same as Primary Standard | 50 µg/m$^3$ |
| | Annual Arithmetic Mean | - | | 20 µg/m$^3$ |
| Fine Particulate Matter ($PM_{2.5}$) | 24-Hour | 35 µg/m$^3$ | Same as Primary Standard | - |
| | Annual Arithmetic Mean | 15 µg/m$^3$ | | 12 µg/m$^3$ |
| Lead (Pb) | 30-Day Average | - | - | 1.5 µg/m$^3$ |
| | Calendar Quarter | 1.5 µg/m$^3$ | Same as Primary Standard | - |
| | 3-Month Rolling Average | 0.15 µg/m$^3$ | | |
| Hydrogen Sulfide (HS) | 1-Hour | No Federal Standards | | 0.03 ppm (42 µg/m$^3$) |
| Sulfates ($SO_4$) | 24-Hour | | | 25 µg/m$^3$ |
| Visibility Reducing Particles | 8-Hour (10 am to 6 pm, Pacific Standard Time) | | | In sufficient amount to produce an extinction coefficient of 0.23 per kilometer due to particles when the relative humidity is less than 70%. |
| Vinyl chloride[2] | 24 Hour | | | 0.01 ppm (26 µg/m$^3$) |

[1]NAAQS (other than $O_3$, particulate matter, and those based on annual averages or annual arithmetic mean) are not to be exceeded more than once a year. The $O_3$ standard is attained when the fourth highest 8-hour concentration in a year, averaged over 3 years, is equal to or less than the standard. For $PM_{10}$, the 24-hour standard is attained when 99% of the daily concentrations, averaged over 3 years, are equal to or less than the standard. For $PM_{2.5}$, the 24-hour standard is attained when 98% of the daily concentrations, averaged over 3 years, are equal to or less than the standard.

[2]The CARB has identified lead and vinyl chloride as "toxic air contaminants" with no threshold level of exposure for adverse health effects determined. These actions allow for the implementation of control measures at levels below the ambient concentrations specified for these pollutants.

µg/m$^3$ = micrograms per cubic meter; mg/m$^3$ = milligrams per cubic meter.
Source: CARB 2010, USEPA 2010.

Toxic air pollutants, also called hazardous air pollutants (HAPs), are a class of pollutants that do not have ambient air quality standards but are examined on an individual basis when there is a source of these pollutants. The State of California has identified particulate emissions from diesel engines as a toxic air pollutant.

Notwithstanding the lack of USEPA regulation of greenhouse gas emissions, in 2006, the California Legislature adopted Assembly Bill (AB 32), the California Global Warming Solutions Act of 2006. AB 32 requires the CARB, the State agency charged with regulating statewide air quality, to adopt rules and regulations that would achieve GHG emissions equivalent to statewide levels in 1990 by 2020. As the policy making process continues, CARB is considering a broader set of mitigation measures, including carbon sequestration projects and best management practices that are technologically feasible and cost-effective. Greenhouse gases as defined under AB 32 include: carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride.

#### 3.3.1.1.2 Regional Setting

Silver Strand Training Complex (SSTC) and the portions of Naval Air Station, North Island (NASNI) that are utilized for training are located within San Diego County and are under the jurisdiction of the San Diego Air Pollution Control District (APCD). The APCD is the agency responsible for the administration of federal and state air quality laws, regulations, and policies in the San Diego Air Basin (SDAB), which is contiguous with San Diego County.

The SDAB and all of Southern California lay in a semi-permanent high-pressure zone of the Eastern Pacific Region. The coastal island is characterized by sparse rainfall (most of which occurs in the winter season) and hot, dry summers, tempered by cooling sea breezes. In San Diego County, the months of heaviest precipitation are November through April, averaging 10.29 inches annually. The mean temperature in the San Diego Bay area, as reported by monitors at San Diego International Airport, is 63.2 degrees Fahrenheit (°F) (Western Regional Climate Center [WRCC] 2005). The mean maximum and mean minimum temperatures are 69.9°F and 56.4°F, respectively (Id.).

In December 2002, the APCD submitted a maintenance plan for the 1-hour NAAQS for $O_3$ and requested redesignation from a serious $O_3$ nonattainment area to attainment. An attainment area is a geographic area that meets or does better than the NAAQS for a particular pollutant. As of July 28, 2003, the SDAB was reclassified as an attainment area for the 1-hour NAAQS for $O_3$. On April 15, 2004, the SDAB was designated a basic nonattainment area for the 8-hour NAAQS for $O_3$, and on July 15, 2005, the 1-hour NAAQS for $O_3$ was rescinded. The Environmental Protection Agency (EPA) was challenged on their justification for “basic” nonattainment designations and published proposed for all “basic” nonattainment areas for the 8-hour NAAQS for $O_3$. The SDAB would be classified as a moderate nonattainment area under the revised classification. In 1994, the SDAB attained the standard for CO; the air basin is considered a maintenance area for CO and has been subject to a maintenance plan. The SDAB is currently in attainment for the NAAQS for all other criteria pollutants. The SDAB is currently classified as a nonattainment area under the CAAQS for $O_3$, $PM_{10}$, and $PM_{2.5}$.

The APCD operates a network of ambient air monitoring stations throughout San Diego County. The purpose of the monitoring stations is to measure ambient concentrations of the pollutants and determine whether the ambient air quality meets the CAAQS and the NAAQS. The nearest ambient monitoring station to the project site is located in Chula Vista, California. Ambient concentrations of pollutants over the last five years, as recorded at the Chula Vista monitoring station are presented in Table 3.3-2.

**Table 3.3-2: Background Ambient Air Quality – Chula Vista Monitoring Station**

| Pollutant | Averaging Time | 2004[1] | 2005[1] | 2006[1] | 2007[1] | 2008[1] | CAAQS[1] | NAAQS[1] |
|---|---|---|---|---|---|---|---|---|
| $O_3$ | 8 hour | 0.087 | 0.081 | 0.068 | 0.087 | 0.083 | 0.070 | 0.075 |
| | 1 hour | 0.097 | 0.093 | 0.084 | 0.105 | 0.107 | 0.09 | - |
| $PM_{10}$[2] | Annual Arithmetic Mean | 25.8 μg/m$^3$ | 26.5 μg/m$^3$ | 26.3 μg/m$^3$ | 25.5 μg/m$^3$ | 26.2 μg/m$^3$ | 20 μg/m$^3$ | 50 μg/m$^3$ |
| | 24 hour | 44 μg/m$^3$ | 52 μg/m$^3$ | 52 μg/m$^3$ | 57 μg/m$^3$ | 53 μg/m$^3$ | 50 μg/m$^3$ | 150 μg/m$^3$ |
| $PM_{2.5}$ | Annual Arithmetic Mean | 12.2 μg/m$^3$ | 11.8 μg/m$^3$ | 11.2 μg/m$^3$ | 12.5 μg/m$^3$ | 12.3 μg/m$^3$ | 12 μg/m$^3$ | 15 μg/m$^3$ |
| | 24 hour | 32.7 μg/m$^3$ | 34.3 μg/m$^3$ | 30.2 μg/m$^3$ | 77.8 μg/m$^3$ | 32.9 μg/m$^3$ | - | 35 μg/m$^3$ |
| $NO_2$ | Annual | 0.016 | 0.016 | 0.017 | 0.015 | 0.015 | - | 0.053 |
| | 1 hour | 0.072 | 0.071 | 0.074 | 0.082 | 0.072 | 0.25 | - |
| CO | 8 hour | 2.48 | 2.13 | 2.20 | 2.2 | 1.9 | 9.0 | 9 |
| | 1 hour | 3.9 | 2.8 | 2.7 | 3.1 | 2.0 | 20 | 35 |
| $SO_2$ | Annual | 0.003 | 0.003 | 0.003 | 0.002 | 0.002 | - | 0.030 |
| | 24 hour | 0.016 | 0.005 | 0.006 | 0.004 | 0.004 | 0.04 | 0.14 |
| | 3 hour[3] | 0.021 | 0.009 | 0.013 | 0.007 | 0.005 | - | 0.5 |
| | 1 hour | 0.042 | 0.016 | 0.017 | 0.012 | 0.007 | 0.25 | - |

[1]Concentrations in ppm unless otherwise indicated
[2]California averages reported for $PM_{10}$
[3]Secondary NAAQS
"–"= not available from current website data
Source: www.arb.ca.gov (all pollutants except 1-hour CO and 1-hour and 3-hour $SO_2$ and annual data for 2007)
www.epa.gov/air/data/monvals.html (1-hour CO and 1-hour and 3-hour $SO_2$ and annual data for 2007)

Both the 1-hour CAAQS for $O_3$ and the federal 8-hour $O_3$ standards were exceeded once in 2004 as reported by the Chula Vista monitoring station. The previous federal 24-hour $PM_{2.5}$ standard was exceeded once in 2003; however, the exceedance occurred during the Cedar Fire event in San Diego County. The Chula Vista monitoring station also recorded measurement exceedances of state $PM_{10}$ and $PM_{2.5}$ standards during the period from 2003 to 2007. As shown in Table 3.3-2, the data from the monitoring station indicates that air quality is in attainment of all other state and federal standards.

### 3.3.1.1.3 Region of Influence

Specifically identifying the Region of Influence (ROI) for air quality requires knowledge of the type of pollutant, emission rates of the pollutant source, proximity to other emission sources, and local and regional meteorology. The ROI for the SSTC and NASNI is defined by the SDAB. For inert pollutants (all pollutants other than $O_3$ and its precursors), the ROI is generally limited to a few miles downwind from the source. However, for a photochemical pollutant such as $O_3$, the ROI may extend much farther downwind. $O_3$ is a secondary pollutant that is formed in the atmosphere by photochemical reactions of previously emitted pollutants, or precursors (ROG and $NO_x$). The maximum effect on $O_3$ levels from precursors tends to occur several hours after the time of emission during periods of high solar load and may occur many miles from the source. $O_3$ and $O_3$ precursors transported from other regions can also combine with local emissions to produce high local $O_3$ concentrations.

### 3.3.1.2 Federal Requirements

Under the National Environmental Policy Act (NEPA), air quality impacts must be evaluated and assessed with regard to the significance of their impacts. NEPA is applicable to areas that are within the United States Territory, typically defined as within 12 nautical miles of shore and on land. In addition to NEPA, the Clean Air Act (CAA) and New Source Review (NSR) are applicable to analyses of impacts to air quality. These federal requirements are discussed in the following sections.

#### 3.3.1.2.1 Clean Air Act

The USEPA is the agency responsible for enforcing the CAA of 1970 and its 1977 and 1990 amendments. The purpose of the CAA is to establish NAAQS, which classify areas as to their attainment status relative to NAAQS; develop schedules and strategies to meet the NAAQS; and to regulate emissions of criteria pollutants and air toxics to protect public health and welfare. Under the CAA, individual states are allowed to adopt ambient air quality standards and other regulations, provided they are at least as stringent as federal standards. The Clean Air Act Amendments (CAAA) established new deadlines for achievement of NAAQS, dependent upon the severity of nonattainment.

The USEPA requires each state to prepare a State Implementation Plan (SIP), which describes how that state will achieve compliance with NAAQS. A SIP is a compilation of goals, strategies, schedules, and enforcement actions that will lead the state into compliance with all federal air quality standards. Each change to a compliance schedule or plan must be incorporated into the SIP. In California, the SIP consists of separate elements for each air basin, depending upon the attainment status of the particular air basin.

The CAAA also require that states develop an operating permit program that would require permits for all major sources of pollutants. The program would be designed to reduce criteria pollutant emissions and control emissions of hazardous air pollutants by establishing control technology guidelines for various classes of emission sources. Under the CAA, state and/or local agencies may be delegated authority to administer the requirements of the CAA, including requirements to obtain permits to operate stationary sources on Navy installations. Section 3.3.1.3 discusses the local permitting requirements for equipment that is subject to these requirements.

Under 40 Code of Federal Regulations (CFR) Part 93 and the provisions of Part 51, Subchapter C, Chapter I, Title 40, Appendix W of the CFR, of the CAA as amended, federal agencies are required to demonstrate that federal actions conform with the applicable SIP. In order to ensure that federal activities do not hamper local efforts to control air pollution, Section 176(c) of the CAA, 42 United States Code (USC) 7506(c) prohibits federal agencies, departments, or instrumentalities from engaging in, supporting, providing financial assistance for, licensing, permitting or approving any action which does not conform to an approved SIP or federal implementation plan. The provisions of Part 51, Subchapter C, Chapter I, Title 40, of the CFR, in effect December 27, 1993, applicable to the subparts listed in this regulation were adopted by the APCD as Rule 1501—Conformity of General Federal Actions.

The USEPA general conformity rule applies to federal actions occurring in nonattainment or maintenance areas when the total direct and indirect emissions of nonattainment pollutants (or their precursors) exceed specified thresholds. The emission thresholds that trigger requirements of the conformity rule are called *de minimis* levels. Table 3.3-3 identifies the federal nonattainment pollutants and the relevant *de minimis* emission thresholds.

**Table 3.3-3: *De Minimis* Levels for Determination of Applicability of General Conformity Rule**

| | *De Minimis* Levels, (tons/year) | | | | | | |
|---|---|---|---|---|---|---|---|
| **Air Basin** | **CO** | **$NO_x$** | **ROG** | **$NO_2$** | **$PM_{10}$** | **$PM_{2.5}$** | **$SO_2$** |
| SDAB | 100 | 100 | 100 | N/A | N/A | N/A | N/A |

Federal actions that are exempt from conformity determinations must also demonstrate that the action's emissions would not be regionally significant. Regionally significant emissions are defined as 10 percent or more of the projected regional emissions in the air basin in which the Proposed Action occurs. Should emissions be regionally significant, a Conformity Determination would be required.

#### 3.3.1.2.2 New Source Review

A New Source Review (NSR) is required when a source has the potential to emit any pollutant regulated under the CAA in amounts equal to or exceeding specified major source thresholds (100 or 250 tons per year), predicated on the source's industrial category. A major modification to the source also triggers a NSR. Any new or modified stationary emission source requires construction and operating permits from the APCD. Through the APCD's permitting process, all stationary sources are reviewed and are subject to a NSR process. The NSR process ensures that factors such as the availability of emission offsets and their ability to reduce emissions are addressed and conform with the SIP.

#### 3.3.1.2.3 Executive Order 12088

Executive Order (EO) 12088 requires each federal agency to comply with "applicable pollution control standards" defined as "the same substantive, procedural, and other requirements that would apply to a private person." The EO further requires federal agencies to cooperate with the USEPA, state, and local environmental regulatory officials. To ensure cost-effective and timely compliance with applicable pollution control standards, the USEPA Administrator is required to provide technical advice and assistance to executive agencies. EO 12088 also states that disputes between the USEPA and other federal agencies, regarding environmental violations, shall be elevated to the Office of Management and Budget for resolution. In 2000, Section 1-4 Pollution Control Plan, of EO 12088 was revoked in part by EO 13148, which was later rescinded in January 2007 by EO 13423.

#### 3.3.1.2.4 Executive Order 13423

EO 13423, Strengthening Federal Environmental, Energy, and Transportation Management, was issued to ensure that all Federal agencies conduct environmental, transportation, and energy-related activities under the law in support of their respective missions in an environmentally, economically, and fiscally sound, integrated, continuously improving, efficient, and sustainable manner. EO 13423 requires (a) that Federal agencies improve energy efficiency and reduce greenhouse gas emissions, (b) the use of renewable energy to the extent feasible, (c) Federal agencies reduce water consumption intensity, (d) the use of goods and services that meet sustainable practices, (e) that Federal agencies reduce the amount of hazardous and toxic waste generated and implement waste management procedures, (f) implementation of sustainable building practices, (g) the agency to reduce fuel consumption for Fleet vehicles, and (h) that Federal agencies use electronic products that meet energy and environmental requirements. Each federal agency is responsible for meeting the goals and requirements of this order.

#### 3.3.1.2.5 Chief of Naval Operations Instruction 5090.1

The Navy, in fulfilling the requirements of EO 13423, has developed Chief of Naval Operations Instruction (OPNAVINST) 5090.1, which contains guidance for environmental evaluation. Chapter 5 and Appendix F of 5090.1 contain guidance for air quality analysis and general conformity determinations.

In order to demonstrate conformity with the CAA, a project must clearly demonstrate that it does not cause or contribute to any new violation of any standard in any area; increase the frequency or severity of any existing violation of any standard in any area; or delay timely attainment of any standard, any required interim emission reductions, or other milestones in any area. A conformity applicability analysis is required for each of the nonattainment pollutants or its precursor emissions.

Compliance with the conformity rule can be demonstrated in several ways. Compliance is presumed if the net increase in direct and indirect emissions from a federal action would be less than the relevant *de minimis* level. The Proposed Action must also demonstrate that its net emission increase is not regionally significant, where regionally significant is defined as 10 percent of basin-wide emissions. If net emissions exceed the relevant *de minimis* value, or if a project is regionally significant, a formal conformity determination process must be followed.

### 3.3.1.3 Local Requirements

As indicated previously, in San Diego County, the APCD is the agency responsible for the administration of federal and state air quality laws, regulations, and policies. Included in the APCD's tasks are monitoring of air pollution, preparation of the SIP for the SDAB, and the promulgation of rules and regulations. The SIP includes strategies and tactics to be used to attain the federal $O_3$ standard within San Diego County. The SIP elements are taken from the Regional Air Quality Strategy (RAQS) and the APCD plan for attaining the state $O_3$ standard, which is more stringent than the federal standard. The APCD's rules and regulations include procedures and requirements to control the emission of pollutants and to prevent adverse impacts.

Applicable APCD rules and regulations include:

- Rule 11 – Exemptions from Rule 10 Permit Requirements. Rule 11 provides exemptions from the requirements of Rule 10 to obtain permits for certain categories of sources. Rule 11 specifically exempts the following sources used at the SSTC: mobile sources; any reciprocating internal combustion engine with a brake horsepower rating of less than 50; any engine mounted on, within, or incorporated into any motor vehicle, train, ship, boat, or barge, that is used exclusively to load or unload cargo; portable pile drivers and construction cranes that are routinely dismantled and transported to noncontiguous locations for temporary use; any portable internal combustion engine or gas turbine engine used exclusively in conjunction with military tactical support equipment (TSE); and any portable equipment that is registered in accordance with District Rule 12.1.
- Rule 12 and Rule 12.1 – Registration of Specified Equipment/Portable Equipment Registration. Rule 12 and 12.1 allow for the registration of internal combustion engines that are registered under the APCD's or CARB's registration program in lieu of permitting under Rule 10.
- Rule 50 – Visible Emissions. Rule 50 limits emissions of visible emissions from any single source of emissions whatsoever and any air contaminant for a period or periods aggregating more than three minutes in any period of 60 consecutive minutes which is darker in shade than that designated as Number 1 on the Ringelmann Chart, as published by the United States Bureau of Mines, or of such opacity as to obscure an observer's view to a degree greater than does smoke of a shade designated as Number 1 on the Ringelmann Chart. It should be noted that the use of

obscurants for the purpose of training military personnel and the testing of military equipment by the United States Department of Defense on any military reservation and equipment used exclusively for the purpose of flash-over fire fighting training are exempt from the requirements of Rule 50.

- Rule 51 – Nuisance. Rule 51 requires that a person shall not discharge from any source whatsoever such quantities of air contaminants or other material which cause injury, detriment, nuisance or annoyance to any considerable number of persons or to the public or which endanger the comfort, repose, health or safety of any such persons or the public or which cause or have a natural tendency to cause injury or damage to business or property.
- Regulation XV – Federal Conformity. The purpose of Regulation XV and Rule 1501 are to assure that federal agencies do not take or support actions which are in any way inconsistent with the efforts of the APCD to achieve the NAAQS, and that federal agencies do not fail to take advantage of opportunities to assist in the achievement of the NAAQS. Under the CAA Section 176(c), as amended (42 USC 7506(c) et. seq.) and regulations under 40 CFR part 51 Subpart W, no department, agency or instrumentality of the federal government shall engage in, support in any way or provide financial assistance for, license or permit, or approve any activity which does not conform to an applicable implementation plan.

These regulations require that facilities constructing, altering, or replacing stationary equipment that may emit air pollutants obtain an Authority to Construct permit. Further, APCD regulations require stationary sources of air pollutants to obtain and maintain Permits to Operate for all stationary sources subject to the requirements of Regulation II. The Navy must submit applications to the APCD for their review and approval. The APCD is responsible for the review of applications and for the approval and issuance of these permits. Once a permit is issued, the Navy is responsible for compliance with the conditions specified in the permit, and is responsible for quantification of emissions associated with the permitted unit. Certain equipment is allowed to be registered under Rule 12 in lieu of obtaining a permit to operate. The APCD does not have quantitative emissions limits for construction activities, nor for long-term emissions that may result from increased vehicle use or other mobile sources. The specific prohibitions set forth in Rules 50 and 51 require compliance with restrictions on emissions of visible matter, nuisance emissions (such as odors or dust), and particulates. These rules would apply to as the use of ordnance and combustion equipment in individual training exercises.

Under APCD Rule 11(d)(2)(xv), any portable internal combustion engine or gas turbine engine used exclusively in conjunction with military TSE is exempt from the requirements of the APCD to obtain a permit. Military equipment is registered with the CARB, which allows the CARB to account for operation of such equipment in the emissions budgets contained within the SIP.

#### 3.3.1.4 Current Mitigation Measures

The Navy currently has a comprehensive air quality management program. Mitigation measures that are part of the Navy's air quality management practices are implemented at SSTC. For example, vehicles participating in training exercises that occur on unpaved surfaces travel at slow speeds, which minimizes fugitive dust generation. Training areas at SSTC include beach areas, where vehicles typically travel on hard-packed or wet sand with minimal silt content, which also minimizes fugitive dust generation. Aircraft, marine vessels, ground vehicles, and military equipment are maintained and meet applicable emission standards (such as smog certification for on-road vehicles) in accordance with state requirements.

### 3.3.2 Environmental Consequences

This resource section focuses on groups of activities that have the potential to result in an impact to the ambient air quality. As discussed in Chapter 2, similar types of activities are grouped together to facilitate the impacts analysis. Types of activities that could affect air quality include aircraft activities, marine vessel activities, amphibious activities, ground vehicles activities, and above ground ordnance and small arms usage. Based on the review of Tables 2-1, 2-2, and Appendix C of this document, every training activity involves some type of equipment or activity that would result in air emissions. Components of training activities that do not have the potential to affect air quality include swimming and non-motorized combat raiding rubber crafts (CRRCs), physical training exercises not involving the use of ground vehicles, and underwater detonations, which would not release air emissions to the atmosphere. Also, any aircraft activities occurring higher than 3,000 feet above ground level (AGL) would not affect the ambient air quality because emissions would occur above the atmospheric boundary layer that traps pollutants within the ambient air that could affect ground-level air quality (USEPA 1992).

Activities involving aircraft that could affect air quality include 4, 6, 12, 16, 25, 28-30, 35, 37, 64, 66 (Table 2-1), and N3-N9 (Table 2-2). Activities involving marine vessels that could affect air quality include 1-6, 8-18, 20-30, 32-35, 37-46, 48, 49, 51-55, 60, 64, 71, 73, 77, 78 (Table 2-1), N1-N3, and N9 (Table 2-2). Activities involving ordnance and/or small arms use that could affect air quality include 4, 6, 7, 9, 12, 25, 26-28, 30- 35, 43, 48, 57, 60-62, 64, 71, 75-77 (Table 2-1), N2, N8, and N11 (Table 2-2). Activities involving ground vehicles that could affect air quality include 4-12, 14, 15, 17-23, 25-31, 35-43, 45, 46-52, 54-77 (Table 2-1), N1, N2, N8, N10 and N11 (Table 2-2).

#### 3.3.2.1 Approach to Analysis

The data for air quality analyses is based on current and proposed training activities at SSTC and on the southern beaches and nearshore waters of NASNI as described in Chapter 2. Increases in tempo under the Proposed Action from baseline conditions were evaluated using the same methodology for calculating emissions as was used for the baseline evaluation presented below. Training scenarios were used to estimate the number of aircraft, marine vessels, and ordnance participating in SSTC activities for the No Action Alternative (i.e., baseline activities), with increases evaluated for Alternatives 1 and 2.

Emissions were calculated based on information on the types of aircraft, marine vessels, ground vehicles, and TSE involved in each training activity as summarized in Appendix C. Information regarding specific operation of each emission source was based on interviews with training officers involved in the training exercises; this information provided estimates of the duration of training activities and the number of hours that emission sources would be used for each activity. Where information was not available, it was assumed that emission sources would operate for eight hours per day. Training activities were assumed to occur within three nautical miles of the shore unless otherwise indicated. Aircraft activities at SSTC were assumed to occur below an altitude of 3,000 feet AGL.

The Proposed Action would not result in additional personal vehicle emissions.

#### 3.3.2.1.1 Emissions Evaluation Methodology

##### Aircraft Activities

The methodology for estimating aircraft emissions involves evaluating the type of activity, the number of hours of operation, the type of engine, and the mode of operation for each type of aircraft. The operational characteristics of aircraft activities for the baseline were obtained from Navy records. Emissions occurring above 3,000 feet were considered to be above the atmospheric inversion layer and would not impact the local air quality. Aircraft flights, for the most part, originate from onshore air stations, but some are from aircraft carriers offshore. It was assumed that landings and takeoffs of aircraft participating in SSTC activities would be counted in the emission inventory for each individual base or carrier where the aircraft originated. It was assumed that training activities would occur regardless of whether the training occurs at SSTC, and that takeoffs and landings would originate from the individual base or carrier where aircraft are based regardless of the Proposed Action requirements. Specific operational modes for aircraft were identified by the Navy for training in which aircraft are involved. Emissions for aircraft activities were then calculated based on the Navy's Aircraft Environmental Support Office (AESO) data for specific aircraft models (AESO 1999a, 1999b, 2000a, 2000b, 2001a, 2001b).

##### Surface Ship Activities

Marine vessel traffic in the SSTC is composed mainly of vessels providing various services for the military training activities and tests. A number of nonmilitary commercial vessels and recreational vessels are also regularly present at areas surrounding SSTC. Because they are present regardless of military activities, they are not considered to be part of the baseline emissions attributable to Navy activities. For the purpose of determining the baseline emissions, only military vessels and those vessels responsible for providing support are considered. The methodology for estimating marine vessel emissions involves evaluating the type of activity, the number of hours of activity, the type of propulsion engine, and the type of generator used onboard for each type of vessel.

Emission factors for vessels were based on engine emission data and provided by JJMA Consultants (JJMA 2001) and are presented in Appendix C.

##### Naval Ordnance

Ordnance emissions result from firing naval flares, smoke grenades, simulated grenades, blanks, simunitions, and land detonations used in the various training activities. Ordnance was classified into various types (smoke, flares, grenades, etc.). Emission factors for specific types of ordnance were obtained from the USEPA's AP-42 emission factor database. For underwater detonations, it was assumed that air emissions would be minimal as emissions would not be released directly into the atmosphere.

##### Emissions from Ground Vehicles

Ground vehicles involved in training activities at SSTC include combustion emissions from government vehicles such as trucks, High Mobility Multipurpose Wheeled Vehicles (HMMWVs), Lighter, Amphibious, Resupply, Cargo-5 ton (LARC Vs), logistical vehicles, vans, construction equipment, etc. used in various training activities. Emissions associated with ground vehicles were estimated based on emission factors for specific equipment, or for ground vehicles, from the CARB's Emission Factors (EMFAC) 2007 model, which provides emission factors for on-road vehicles, or the OFFROAD model.

#### Tactical Support Equipment

Tactical Support Equipment includes equipment such as generators that would be used during training activities. Emissions from TSE have been estimated based on information provided on the usage of TSE for various training activities, using the USEPA's emission factors from AP-42 for combustion equipment.

### 3.3.2.1.2 Baseline Emissions

The emissions baseline levels provide a basis for evaluating potential emission increases associated with the Proposed Action and alternatives. For the purpose of estimating $PM_{2.5}$ emissions, it was assumed that $PM_{10}$ emissions associated with combustion would be composed of 99 percent $PM_{2.5}$ (South Coast Air Quality Management District [SCAQMD] 2006). Baseline emissions are summarized in Table 3.3-4. Detailed emission calculations are provided in Appendix C.

### 3.3.2.2 No Action Alternative

The No Action Alternative involves conducting training at the baseline levels. The emissions levels would remain constant for those baseline emission sources that are not affected by other federal, state, or local requirements to reduce air emissions. Emissions associated with motor vehicles may decrease due to the implementation of federal and California CAA requirements to reduce tailpipe emissions.

Emissions for the No Action Alternative reflect baseline levels that are currently occurring in the SSTC. As a result, no net emission increases would result from implementation of the No Action Alternative. With no net emission increases expected, the No Action Alternative is exempt from the General Conformity Rule.

### 3.3.2.3 Alternative 1 (Preferred Alternative)

Implementation of Alternative 1 would increase the training tempo from 3,926 activities to 5,343 activities annually. Implementation of Alternative 1 would also include the introduction of new types of training activities, conducting existing routine training activities at additional locations within SSTC established training areas, and increasing access to and availability of existing beach and inland training areas.

As discussed in Section 3.3.2.1, operational parameters for increased training were based on interviews with training officers at SSTC. The increased training tempo proposed under Alternative 1 would result in increases in air emissions. Table 3.3-4 presents a summary of the emissions associated with activities at SSTC under Alternatives 1 and 2 in comparison to the No Action Alternative. Emission calculations are provided in Appendix C.

To address the requirements of the General Conformity Rule, the net emissions increase or decrease over the baseline level for Alternative 1 was calculated. Emission calculations are provided in Appendix C. As shown in Table 3.3-4, the emissions increases for CO, $NO_x$ and ROG are below the *de minimis* thresholds for requiring a full conformity determination and are less than 10 percent of the projected regional emissions in the SDAB, and therefore not regionally significant. The General Conformity Rule is therefore not applicable. A Record of Non-Applicability is included in Appendix D.

**Table 3.3-4: Operational Emissions at SSTC and Portions of NASNI with Evaluation of Conformity**

| | Emissions (tons/year) | | | | | |
|---|---|---|---|---|---|---|
| **Emission Source** | **CO** | **$NO_x$** | **ROG** | **$SO_x$** | **$PM_{10}$** | **$PM_{2.5}$** |
| **No Action Alternative** | | | | | | |
| Aircraft | 6.0 | 5.1 | 0.6 | 0.3 | 3.1 | 3.1 |
| Surface Ships | 170.1 | 124.8 | 45.8 | 53.5 | 21.5 | 21.5 |
| Ordnance | 0.22 | 0.0 | 0.0 | 0.1 | 0.3 | 0.3 |
| Ground Vehicles/Military equipment | 24.0 | 46.6 | 5.7 | 2.1 | 3.3 | 3.3 |
| **Total** | **200.4** | **176.5** | **52.1** | **56.0** | **28.2** | **28.2** |
| | | | | | | |
| **Alternatives 1 and 2** | | | | | | |
| Aircraft | 21.6 | 16.5 | 2.7 | 1.1 | 9.0 | 9.0 |
| Surface Ships | 199.2 | 155.3 | 55.2 | 73.9 | 27.6 | 27.6 |
| Ordnance | 0.3 | 0.0 | 0.0 | 0.2 | 0.4 | 0.4 |
| Ground Vehicles/Military equipment | 27.1 | 44.5 | 6.2 | 2.6 | 3.8 | 3.8 |
| **Total** | **248.2** | **216.3** | **64.1** | **77.8** | **40.8** | **40.8** |
| | | | | | | |
| **Alternatives 1 and 2 Increases over Baseline** | ***47.8*** | ***39.8*** | ***12.0*** | ***21.8*** | ***12.6*** | ***12.6*** |
| *De minimis* Limits | 100.00 | 100.00 | 100.00 | N/A | N/A | N/A |
| San Diego Air Basin forecast emissions for 2010[1] | 270,793 | 57,451 | 63,035 | | | |

[1]Emissions for year 2010 are from CARB emissions inventory website, http://www.arb.ca.gov/app/emsinv/emseic1_query.php

### 3.3.2.4 Hazardous Air Pollutants

As discussed above, the USEPA has listed 188 substances that are regulated under Section 112 of the CAA, and the state of California has identified additional substances that are regulated under state and local air toxics rule. HAPs are emitted from a variety of processes that are associated with Southern California (SOCAL) Range Operations, including combustion sources and ordnance use. Trace amounts of HAPs are emitted from sources participating in SSTC training activities, including aircraft, marine vessels, ground vehicles, ground support equipment, and ordnance. The amounts that would be emitted are small in comparison with the emissions of criteria pollutants; emission factors for most HAPs from combustion sources are roughly three or more orders of magnitude lower than emission factors for criteria pollutants. Emissions of HAPs from ordnance use are smaller still, with emission factors ranging from roughly $10^{-5}$ to $10^{-15}$ lbs of individual HAP per item for cartridges to $10^{-4}$ to $10^{-13}$ lbs of individual HAPs per item for mines and smoke pots (USEPA 2006).

Emissions of HAPs would occur over the entire training complex and would be subject to dispersion due to wind mixing and other dissipation factors. Because the majority of activities occur in restricted areas where no sensitive receptors (i.e., residents, schools, hospitals, etc.) are located, no health effects would be anticipated from emissions of HAPs.

### 3.3.2.5 Alternative 2

The only difference between Alternative 1 and 2 is that, under Alternative 2, all SSTC-North oceanside beach training areas would be available for Navy training, regardless of time of year. Therefore, activity emissions associated with Alternative 2 would be the same as those described above for Alternative 1 (Table 3.3-4). Under Alternative 2, the proposed change in access and availability to existing beach and inland training areas would not result in a change in activity emissions from Alternative 1.

As discussed under Alternative 1, the emissions increases for CO, $NO_x$ and ROG are below the *de minimis* thresholds for requiring a full conformity determination, and the General Conformity Rule is therefore not applicable. A Record of Non-Applicability is included in Appendix D.

### 3.3.3 Proposed Mitigation Measures

No adverse effects on air quality were identified for any of the alternatives described; therefore, no proposed mitigation measures are necessary. However, current mitigation measures, implemented as part of the Navy's air quality management program and practices, would continue to be implemented at SSTC.

### 3.3.4 Unavoidable Adverse Environmental Effects

There are no unavoidable adverse environmental effects to air quality as a result of implementation of any of the alternatives.

### 3.3.5 Summary of Effects

Table 3.3-5 summarizes the effects of and mitigation measures for the No Action Alternative, Alternative 1, and Alternative 2.

**Table 3.3-5: Summary of Effects**

| Alternative | Effects |
|---|---|
| **No Action Alternative** | • No increases in emissions above baseline. |
| **Alternative 1** | • Emission increases would be less than the *de minimis* thresholds under the General Conformity Rule. No conformity determination is required. |
| **Alternative 2** | • Emission increases would be less than the *de minimis* thresholds under the General Conformity Rule. No conformity determination is required. |
| **Mitigation Measures** | • The Navy currently has a comprehensive air quality management program. Mitigation measures that are part of the Navy's air quality management practices are implemented at SSTC. Areas that are used for training exercises are typically vegetated, which reduces fugitive dust emissions associated with ground disturbance. Aircraft, marine vessels, ground vehicles, and TSE are required to be maintained and meet applicable emission standards (such as smog certification for on-road vehicles) in accordance with state requirements. |

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# 3.4 Hazardous Materials and Waste

# 3.4 HAZARDOUS MATERIALS AND WASTE

## 3.4.1 Affected Environment

### 3.4.1.1 Introduction

#### 3.4.1.1.1 Definition

This section describes hazardous materials used in and waste generated by Silver Strand Training Complex (SSTC) training. Most of hazardous materials and wastes are associated with vessels, ordnance, or other materials used on SSTC; if released into the environment, hazardous materials and wastes could pose a hazard to human health or the environment.

Hazardous materials are solid, liquid, semisolid, or gaseous chemical substances that are procured for specific uses, such as for vehicle operation. These chemical substances may pose a hazard to human health or the environment. In general, these materials pose hazards because of their quantity, concentration, or physical or chemical characteristics.

Hazardous wastes are solid wastes (i.e., used or expended materials for which no further use is possible or intended). Hazardous wastes may be generated through the use of hazardous materials that retain their hazardous character, or hazardous wastes may be generated through the use of non-hazardous materials in a manner that imparts one or more hazardous characteristics to the waste. A hazardous waste may be a solid, liquid, semisolid, or contain gaseous material that, alone or in combination with other substances, may (a) cause, or significantly contribute to, an increase in mortality or an increase in serious irreversible, or incapacitating reversible illness; or (b) pose a substantial present or potential hazard to humans or the environment when improperly treated, stored, transported, disposed of, or otherwise managed. Hazardous wastes generally are regulated separately from hazardous materials, and typically are handled separately from hazardous materials.

#### 3.4.1.1.2 Regional Setting

SSTC and Naval Air Station North Island (NASNI) are located in a heavily populated, urban area with a variety of land uses. These installations are located on the Silver Strand peninsula and are only accessible—to emergency personnel, residents, and visitors during an incident response—from the greater San Diego metropolitan area via Coronado Bridge to Coronado and through Imperial Beach on State Route (SR)-75.

#### 3.4.1.1.3 Region of Influence

The Region of Influence (ROI) for hazardous materials is the area where these materials are used during training at SSTC and at the southern beaches of NASNI.

The ROI for hazardous wastes includes both SSTC and NASNI beaches where the wastes are generated and the onshore storage, transportation, and disposal facilities where the hazardous wastes are managed. The ROI also includes portions of San Diego Bay and the ocean offshore of SSTC.

### 3.4.1.2 Regulatory Framework

Hazardous materials and wastes are regulated by federal laws and regulations. The relevant laws to the Proposed Action include the Resource Conservation and Recovery Act (RCRA; 42 United States Code [U.S.C.] Section [§] 6901 et seq.), the Hazardous Materials Transportation Act (HMTA; 49 U.S.C. §5101 et seq.), the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA; 42 U.S.C. §9601 et seq.), the Emergency Planning and Community Right to Know Act (EPCRA; 42 U.S.C. §§ 11,001-11,050), the Oil Pollution Act (OPA; 33 U.S.C. §2701 et seq.), the Toxic Substances Control Act (TSCA), and the Pollution Prevention Act of 1990 (PPA; 42 U.S.C. Chapter 133). Comprehensively, the regulations adopted to implement these laws govern the storage, use, and transportation of hazardous materials and wastes from their origin to their ultimate disposal. The recovery and cleanup of environmental contamination resulting from accidental releases of these materials also are addressed in the regulations. In addition, the Military Munitions Response Program (MMRP; 10 U.S.C. §2710) addresses response actions at non-operational ranges. State of California laws and regulations generally implement federal requirements, but broaden their application or impose additional regulatory requirements in some areas.

#### 3.4.1.2.1 Resource Conservation and Recovery Act (RCRA)

The Solid Waste Disposal Act (SWDA) (P.L. 89-272, 79 Stat. 992) of 1965 was enacted to address solid waste management. Hazardous wastes are defined by RCRA, the 1976 amendment to the SWDA. The SWDA was further amended by the Hazardous and Solid Waste Amendments of 1984.

RCRA applies only to materials that first meet the regulatory definition of a solid waste. RCRA specifically defines a hazardous waste as a solid waste, or combination of solid wastes, which because of its quantity, concentration, or physical, chemical, or infectious characteristics, may cause or significantly contribute to an increase in mortality; or an increase in serious, irreversible, or incapacitating reversible illness; or pose a hazard to human health or the environment when improperly treated, stored, disposed of, or otherwise managed (40 Code of Federal Regulations [CFR] 261.10). A solid waste is a hazardous waste if it is not excluded from regulation as a hazardous waste under Section 261.4(b), and it is either a specifically listed waste or exhibits any ignitable, corrosive, reactive, or toxic characteristics (40 CFR Part 261, Subpart C).

Under RCRA, hazardous materials are considered solid wastes—and thus fall under the definition of hazardous wastes—if they are used in a manner constituting disposal, rather than for their intended purpose. Military munitions become subject to RCRA when transported off-range for storage, reclamation, treatment, disposal; if buried or land filled on- or off-range; or if they land off-range and are not immediately rendered safe or retrieved. Transportation, storage, and disposal of these items are governed by RCRA.

In 1997, the United States Environmental Protection Agency (USEPA) published its Final Military Munitions Rule (MMR) (40 CFR § 266.200-206). The MMR identifies when conventional and chemical military munitions become hazardous wastes under RCRA, and provides for their safe storage and transport. Under the MMR, military munitions include, but are not limited to, the following items:

- Confined gaseous, liquid, and solid propellants;
- Explosives;
- Pyrotechnics;
- Chemical and riot agents; and
- Smoke canisters.

The MMR defines training; research, development, test, and evaluation (RDT&E); and clearance of unexploded ordnance and munitions fragments on active or inactive ranges as normal uses of the product. When military munitions are used for their intended purpose, they are not considered to be a solid waste for regulatory purposes. Under the MMR, wholly inert items and nonmunitions training materials are not defined as military munitions. These materials are not excluded from regulation as hazardous wastes under RCRA.

The Federal Facilities Compliance Act (FFCA) of 1992 amended RCRA to ensure a complete and unambiguous waiver of sovereign immunity with regard to administrative fines and penalties on federal facilities. Under the FFCA, Navy facilities are required to comply with State hazardous waste substantive and procedural requirements, including obtaining State permits.

##### 3.4.1.2.2 Hazardous Materials Transportation Act (HMTA)

For air, sea, or land transportation, the U.S. Department of Transportation defines a hazardous material as a substance or material that is capable of posing an unreasonable risk to health, safety, and property when transported in commerce (49 U.S.C. 5101, et seq.; 49 CFR 172.101, Appendix B). The HMTA regulates the transportation of hazardous materials, including ordnance.

##### 3.4.1.2.3 Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)

Under CERCLA Section 101 (14), as amended by the Superfund Amendments and Reauthorization Act, a hazardous substance is defined as any substance that, due to its quantity, concentration, or physical and chemical characteristics, poses a potential hazard to human health and safety or to the environment. CERCLA has established national policies and procedures to identify and clean up sites contaminated in the past by hazardous substances. The Navy implements cleanups of CERCLA sites through the Installation Restoration Program (IRP).

The migration of hazardous substances from historical waste deposits can pose a risk to public health. The IRP was developed to identify, assess, characterize, and clean up or control contamination from past hazardous waste disposal operations and hazardous materials spills at Department of Defense (DoD) facilities. The IRP is intended to be a tool for identifying and cleaning up any contaminant releases that could endanger public health, welfare, or the environment.

The IRP process has three phases. Phase I, the Site Inspection Phase, includes identifying potential hazardous waste sites through interviews, record searches, and minimal sampling. Phase II, the Remedial Investigation/Feasibility Study Phase, includes sampling and remediation design planning. Phase III is the Remedial Design/Remedial Action Phase, in which the site is remediated or secured. IRP sites on SSTC are addressed below.

##### 3.4.1.2.4 Military Munitions Response Program (MMRP)

The MMRP addresses response actions at non-operational ranges where munitions and explosives of concern (MEC) or munitions constituents (MC) are present in the environment from historical uses. MEC is defined as unexploded ordnance (UXO), discarded military munitions, and MC present in high enough concentrations to pose an explosive hazard. MC in lower concentrations are not considered MEC, but may require a response based upon risk to human health or the environment.

The National Defense Authorization Act of 2002 required the DoD to create an inventory of MMRP sites in the United States (U.S.) (10 U.S.C. § 2710[a]) and to create a protocol with which to prioritize sites within each facility, state, or region and across the U.S. (10 U.S.C. Section 2710[b]). 10 U.S.C. Section 2710(a) states that sites that were or are under military control that have a demonstrated presence of MEC or MC contamination or are suspected of having MEC are eligible for entry into the MMRP.

##### 3.4.1.2.5 Range Sustainability Environmental Program Assessment

The Range Sustainability Environmental Program Assessment (RSEPA) was developed to provide a consistent approach for assessing the environmental condition of operational ranges. The RSEPA is a range compliance management process to ensure long-term sustainability using a phase approach of assessment. The RSEPA process is applied to all operational test and training ranges within the U.S. and its territories where munitions are used or were used. The RSEPA process systematically assesses the present environmental compliance conditions and ensures best management practices are in place to assure operational test and training ranges are not posing a significant off-site risk to human health or the environment.

#### 3.4.1.2.6 Emergency Planning and Community Right to Know Act

Section 203 of Executive Order (EO) 13148 (Right-to-Know and Pollution Prevention) states that "[t]hrough timely planning and reporting under the EPCRA, Federal facilities shall be leaders and responsible members of their communities." Thus, a federal agency reports its use of hazardous and toxic chemicals in accordance with EPRCRA. Access to this information contributes to improvements in chemical safety and protection of local communities. The guidance for federal facilities has been incorporated into Chief of Naval Operations Instruction (OPNAVINST) 5090.1. For each installation, the Navy annually submits EPCRA 312, Tier II forms to the emergency responders (Fed Fire) and the San Diego County Certified Unified Program Agency (CUPA), and the EPCRA 313 Toxic Release Inventory (TRI) Form R to USEPA, with courtesy copies to the California Environmental Protection Agency (Cal-EPA) and the Regional Water Quality Control Board.

#### 3.4.1.2.7 Oil Pollution Act (OPA)

OPA requires oil storage facilities and vessels to submit plans to the federal government describing how they will respond to large, unplanned releases. In 2002, OPA was amended by the Oil Pollution Prevention and Response; Non-Transportation-Related Onshore and Offshore Facilities; Final Rule (40 CFR Part 112). This Rule requires Spill Prevention, Control, and Countermeasure (SPCC) Plans and Facility Response Plans. These plans outline the requirements to plan for, and respond to, oil and hazardous substance releases. Oil and hazardous substance releases are reported and remediated in accordance with current Navy policy. Naval Amphibious Base (NAB) Coronado has a SPCC Plan; however, SSTC training does not store sufficient quantities of oil to require coverage under the plan.

#### 3.4.1.2.8 Toxic Substances Control Act (TSCA)

TSCA requires reporting, record-keeping, and testing, and establishes restrictions on chemical substances or mixtures. TSCA also addresses the use and disposal of specific chemicals, such as asbestos and lead-based paint. In general, TSCA limits the manufacture, distribution, use, and disposal of chemical substances that pose a threat to human health. At one time, asbestos was commonly included in building materials such as concrete, masonry, caulks, flooring and ceiling tiles, and mastics; and lead was often used in exterior paints. Friable asbestos is present on and around the foundations of demolished buildings on SSTC-S.

#### 3.4.1.2.9 Pollution Prevention Act of 1990 (PPA)

The PPA focuses on source reduction, reducing pollution through changes in production, operation, and use of raw materials. The PPA addresses other practices that increase efficiency in the use of natural resources, or protect natural resources through conservation.

#### 3.4.1.2.10 State Laws and Regulations

Cal-EPA develops, implements, and enforces the State's environmental protection laws that ensure clean air, clean water, clean soil, safe pesticides, and waste recycling and reduction. Cal-EPA is comprised of several agencies, boards, departments, and offices, with no single entity having sole authority for hazardous materials and wastes. Within Cal-EPA, the Department of Toxic Substances Control (DTSC) is responsible for the use, storage, transport, and disposal of hazardous materials. DTSC regulates hazardous waste, pollution prevention, and clean-up of contamination. However, Cal-EPA delegates much of its responsibility for hazardous materials management to local governments, under the CUPA program.

Local governments and communities form CUPAs to effectively manage the acquisition, maintenance, and control of hazardous materials in their jurisdictions, and to avoid overlapping roles among federal, State, and local agencies. In Southern California, CUPAs have typically formed on a county-by-county basis. In San Diego County, the CUPA is the San Diego Department of Environmental Health, which is responsible for hazardous materials and hazardous wastes regulation. State hazardous materials and hazardous wastes laws are summarized in Table 3.4-1.

**Table 3.4-1: State of California Laws**

| Law / Regulation | Description |
|---|---|
| Hazardous Materials Release Response Plans and Inventory Act (6.95 Health and Safety Code [HSC]) / 19 California Code of Regulations (CCR), Division 2, Chapter 4 | Requires facilities using hazardous materials to prepare hazardous materials business plans, and establishes the California Accidental Release Prevention Program |
| Hazardous Waste Control Act (6.5 HSC / 22 CCR, Division 4.5) | Regulates the generation, transportation, storage, treatment, and disposal of hazardous waste |
| Safe Drinking Water and Toxic Enforcement Act (Proposition 65; 6.6 HSC / 22 CCR, Division 4) | Regulates the discharge of contaminants to groundwater |

The Navy complies with applicable State regulations under EO 13148, Greening the Government Through Leadership in Environmental Management; DoD Directive 4165.60, Solid Waste Management; and Navy guidelines for hazardous materials and wastes management found in OPNAVINST 5090.1.

### 3.4.1.3 Hazardous Materials

#### 3.4.1.3.1 Management

According to the Navy's *Waste Management Plan* for Navy Region Southwest, hazardous material business plans and unified facility permits are required for all Navy facilities that store hazardous materials exceeding 200 cubic feet of a compressed gas, 500 pounds of a solid, or 55 gallons of a liquid (Department of the Navy [DoN] 2007). These hazardous materials business plans provide guidance and direction on the use, storage, and compliance activities for hazardous materials. Adherence to approved plans assures that hazardous materials used for training are properly managed.

#### 3.4.1.3.2 Transport

Transport on public roads of dangerous substances—hazardous materials and nonfused munitions—is controlled and regulated by the federal Department of Transportation (49 CFR 177). The State enforces federal transportation safety regulations within its jurisdiction. Generally, munitions and other dangerous articles may be transported on public highways if proper safety procedures are followed. Bulk hazardous material loads are prohibited from using Coronado Bridge, so hazardous materials for Naval Base Coronado (NBC) must be transported via Imperial Beach on SR-75.

#### 3.4.1.3.3 Use

Hazardous materials currently used in support of physical aspects of SSTC training activities include petroleum products, coolants, cleaning compounds, batteries, explosives, and pyrotechnic materials. Most of the hazardous materials used at SSTC are stored in the Hazardous Material Minimization Center at NBC. Ordnance is stored in Ready Service Lockers.

Training activities involve numerous vehicles, aircraft, ships, boats, and support craft. These manned vessels do not intentionally release any hazardous constituents into the water. However, small amounts of diesel fuel or engine oil may leak onto the ground or into the water.

### 3.4.1.4 Hazardous Waste

#### 3.4.1.4.1 Management

NAB Coronado, on which a portion of SSTC is located, is a Large-Quantity Generator and Transporter of hazardous waste under RCRA (USEPA RCRA Identification Number CA9170023130). NAB Coronado was last inspected by the San Diego CUPA in January 2008; at that time NAB was found to be in compliance with general generator requirements (USEPA 2009). SSTC training activities generate hazardous wastes primarily through operation of vehicles and equipment required for training. These waste streams include used batteries, spill cleanup materials, and used petroleum products. Commander, Navy Region Southwest prepared a *Hazardous Waste Management Plan* (HWMP) (DoN 2007) and a *Regional Explosive Hazardous Waste Management Plan* (DoN 2004) for Navy facilities in the San Diego region. These plans provide comprehensive and consistent guidance to personnel at SSTC-North (SSTC-N) and SSTC-South for characterization, storage, disposal, and record-keeping of RCRA and non-RCRA wastes.

For SSTC marine activities, environmental compliance policies and procedures applicable to shipboard operations are defined in OPNAVINST 5090.1. These instructions reinforce the Clean Water Act prohibition against discharging harmful quantities of hazardous substances into or upon U.S. waters out to 200 nautical miles. Navy ships are required to conduct operations in such a manner as to minimize or eliminate any adverse impacts on the marine environment.

There are several satellite accumulation areas and one 90-day accumulation area at SSTC. Hazardous waste is collected from the 90-day accumulation area and transported by a Defense Reutilization and Marketing Office contractor to an approved Treatment, Storage, or Disposal (TSD) facility.

#### 3.4.1.4.2 CERCLA Sites

There are six IRP sites on SSTC-N. Five of these sites were identified during an initial assessment conducted in 1986. In 1993, subsequent studies resulted in a recommendation of further investigation for four of the sites and the exclusion from further investigation of Site 5 (now managed through the MMRP, as outlined in Section 3.4.1.4.3). Further investigation in 1995 resulted in a decision of no further action for Site 1 and identification of an additional IRP site (Site 6). Table 3.4-2 lists the five IRP sites and the status of each. One IRP site, a rubble disposal area, exists on SSTC-S. These sites generally resulted from historical generation of hazardous substances during activities such as vehicle maintenance and repair, burning of motor oils, releases of fuels and solvents from fueling facilities and equipment shops, and releases of sandblast grit and paint.

**Table 3.4-2: SSTC Installation Restoration Program Sites**

| Site | Description | Status |
|---|---|---|
| 1 (SSTC-N) | Building 603 disposal pit | Decision of no further action |
| 2 (SSTC-N) | Old refuse disposal and burn area | Further investigation being conducted |
| 3 (SSTC-N) | New paint shop site | Further investigation being conducted |
| 4 (SSTC-N) | Sandblast grit disposal | Further investigation being conducted |
| 6 (SSTC-N) | Morale, Welfare, and Recreation (MWR) Marina | Removal action conducted/Further investigation being conducted |
| 10 (SSTC-S) | Rubble disposal area | No further investigation planned |

Source: Navy Environmental Leadership Program 2000

At NASNI, 12 major IRP sites have been identified (Navy Environmental Leadership Program 2000). Of these, Sites 1, 5, 6, and 7 are located in areas adjacent to SSTC training on NASNI. These sites are described in Table 3.4-3.

**Table 3.4-3: NASNI Installation Restoration Program Sites**

| Site | Description | Status |
|---|---|---|
| 1 (NASNI) | Shoreline sediments. Sixteen outfalls known to have discharged industrial hazardous wastes in the past. | Some outfall areas have been remediated. |
| 5 (NASNI) | Golf Course Garbage Disposal Area. Solid waste disposal area 1942-1965. Contained both solid and chemical wastes. | Perimeter monitoring is in place. |
| 6 (NASNI) | Public Works Salvage Area. Removal action in 1996 removed polychlorinated biphenyl (PCB)-contaminated soils. | No further action recommended for this site. |
| 7 (NASNI) | Building 39 runoff catchment area. Past use for gunnery school and missile engine test site. | No further remedial action recommended. |

Source: Navy Environmental Leadership Program 2000

No IRP sites will be disturbed by SSTC training activities.

### 3.4.1.4.3 Military Munitions Response Program Sites

Approximately 40 acres of San Diego Bay shore located approximately two miles south of the City of Coronado served as a disposal area for dredge spoils from a 1966 San Diego Bay dredging project. The dredged material used to fill the site was later discovered to contain UXO from the military. In 1969, approximately seven feet of clean fill material was placed on top of the site.

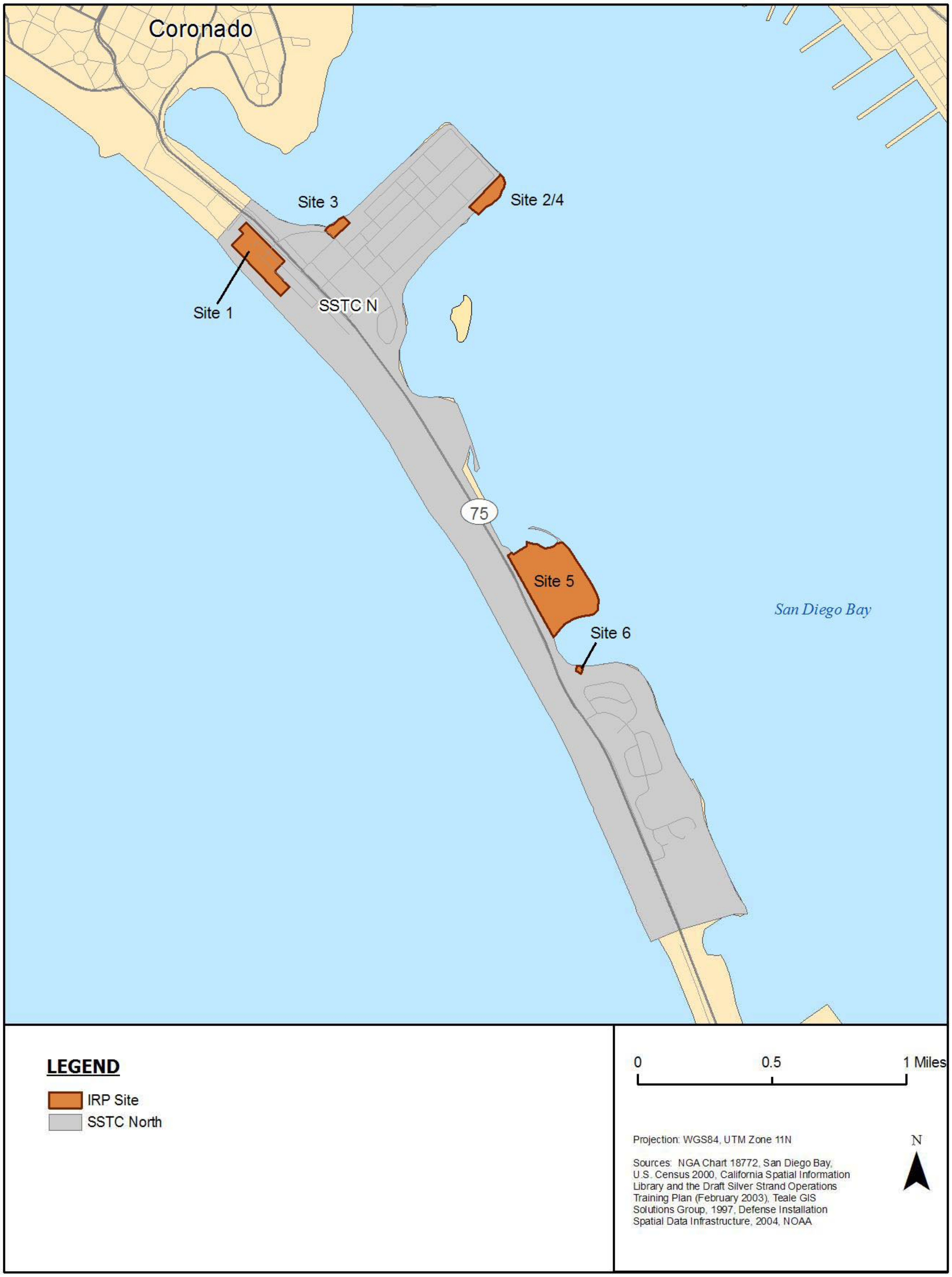
In 1984, the Navy set aside 75 acres on Silver Strand as a California least tern nesting preserve. The disposal area is located within the preserve. The location of this area is provided in Figure 3.4-1. This area was then designated as Delta South, and is now fenced and inaccessible to the public. The disposal area was included in the IRP during an initial assessment in 1986, and was designated as IRP Site 5. In 1990, a UXO sweep was conducted by the Navy, and the area was certified free of surface ordnance. The site, now referred to as MMRP Site 5, has been transferred to the MMRP, and is undergoing further investigation.

The only NASNI MMRP site is Site 8, which was moved from the IRP. This site is currently undergoing a Site Inspection. All IRP and MMRP sites are non-operational clean-up sites and ranges. No MMRP sites will be disturbed by SSTC training activities.

Delta South is a designated Navy training area per Fleet Area Control and Surveillance Facility, San Diego Instruction 3120.1E. It is frequently used by operational groups local to San Diego for land maneuvering and amphibious exercises; no live-fire activities are conducted at Delta South. Training at Delta South does not include intrusive activities such as digging; this restriction is considered sufficient to protect the safety of Navy operators.

### 3.4.1.5 Current Mitigation Measures

The Navy's general instructions (e.g., OPNAVINST 5090.1) and training activity planning and review processes ensure that hazardous materials and hazardous wastes are stored and handled appropriately. The Navy’s current mitigation measures include its *HWMP*, *NBC Hazardous Substance Release Integrated Contingency Plan* (DoN 2008), and *Regional Explosive HWMP* (Section 3.4.1.4.1). Navy personnel also collect expended training materials at the conclusion of a training activity, to the extent practicable.




Source: Navy Environmental Leadership Program 2000

**Figure 3.4-1: Location of SSTC-N IRP Sites**

### 3.4.2 Environmental Consequences

This resource section focuses on groups of activities that could involve certain aspects of hazardous materials management. As discussed previously, similar types of activities are grouped together (agglomerated) for ease of analysis. Types of activities that could affect hazardous materials management are those that use hazardous materials, store bulk chemicals in the training area, generate hazardous wastes, or release hazardous constituents into the environment. These include Activities 4-7, 9-12, 25-28, 30-35, 37, 43, 48, 50, 56, 57, 59-62, 64, 71, 77 (Table 2-1) and N1, N3, N7-N9, and N11 (Table 2-2). Activities that do not involve the use of hazardous materials, storage of bulk chemicals or hazardous wastes on the site, or release hazardous constituents include the following: 1-3, 8, 13-24, 29, 36, 38-42, 44-47, 49, 51, 52-55, 58, 63, 65-70, 72-76 (Table 2-1) and N2, N4-N6, and N10 (Table 2-2). As noted in Section 3.4.1.4.3, IRP and MMRP sites would not be affected by current or proposed training activities at SSTC, and are not discussed further in the analysis.

#### 3.4.2.1 Approach to Analysis

This section addresses hazardous materials and wastes in their broadest sense, because their definitions under various federal and State regulations—intended to accomplish diverse governmental objectives and constrained by specific legal authorities—are not entirely consistent with the actual environmental and human health effects of substances and materials and thus the following definitions are used. Hazardous materials and hazardous wastes were defined in Section 3.4.1.1.1. Hazardous constituents are hazardous materials or substances present at low concentrations within, or as a minor component of, a matrix, package, or construct that is nonhazardous in normal use (e.g., a radio battery).

Hazardous constituents often are used to enhance a material by increasing strength, reducing weight, improving reliability, lowering life-cycle costs, reducing wear, or slowing degradation. Hazardous constituents can be released from their parent material (matrix) when it is disturbed, degraded, or destroyed. The particular hazardous features of these hazardous constituents are generally recognized and understood by their users. Safe handling and pollution prevention measures are a routine part of systems programs to minimize and manage their effects throughout the acquisition process. Among the issues addressed are the types, amounts, and distribution of hazardous constituents associated with the Navy training activities outlined in Chapter 2 of this Environmental Impact Statement.

Materials that contain hazardous constituents include munitions, batteries, telemetry systems, fuel, and hydraulic fluid. Wastes that may contain hazardous constituents include waste oil, aerosols, batteries, used munitions, and cleaning compounds. These materials can affect human health or the environment through direct contact, or through leaching or dispersion of their hazardous constituents.

The significance of potential impacts associated with hazardous materials, constituents, substances, and wastes is based primarily on their characteristics, distribution, transportation, storage, and disposal. Factors used to assess significance include the extent or degree to which implementation of an alternative would substantially increase the human health risk or environmental exposure resulting from the storage, use, transportation, and disposal of these materials and substances. A second measure of significance is whether the use, transportation, storage, and disposal of hazardous items are consistent with the various federal and State laws regulating these materials.

##### 3.4.2.1.1 Explosives

Explosives in modern military ordnance are generally solid-cast explosive fills, formed by melting the constituents and pouring them into steel or aluminum casings. Most new U.S. Navy formulations contain plastic-bonded explosives that use plastic or other polymer binders to increase their stability (Janes 2005, 2006). Royal Demolition Explosive (RDX)/High Melting Explosive (HMX) blends have generally replaced trinitrotoluene (TNT) in plastic-bonded formulations.

Munitions constituents of concern include cyclonitramines, such as RDX and HMX, and their degradation products. RDX is subject to photolysis and biodegradation once exposed to the environment. As a group, military-grade explosives have low water solubility (the amount of a substance that can dissolve into water) (Table 3.4-4), and are relatively immobile in water. The degradation and dissolution of these materials may be further slowed by the physical structure and composition of blended explosives, which contain multiple chemical compounds, often with additional binding agents. For example, Composition (C)-4 is 91 percent RDX and nine percent plasticizers. When military munitions are used for their intended purpose, they are not considered to be a hazardous waste under RCRA.

**Table 3.4-4: Water Solubility and Degradation Products of Common Explosives**

| Compound | Water Solubility (milligrams per liter at 20°C) |
|---|---|
| Salt (sodium chloride) [for comparison] | 357,000 |
| Ammonium perchlorate | 249,000 |
| Picric acid | 12,820 |
| Nitrobenzene | 1,900 |
| Dinitrobenzene | 500 |
| Trinitrobenzene | 335 |
| Dinitrotoluene | 160-161 |
| Trinitrotoluene | 130 |
| Tetryl | 51 |
| Pentaerythritol tetranitrate | 43 |
| RDX | 38 |
| HMX | 7 |
| White phosphorus | 4 |

Source: DoN 2007

#### 3.4.2.1.2 Other Munitions Constituents

Other munitions constituents of concern include pyrotechnic (illumination and smoke) compounds, propellants, primers, and metals (e.g., iron, manganese, copper, lead, zinc, antimony, mercury) released from both initiation primers and ordnance casing corrosion. Common primers include lead azide, lead styphnate, and mercury fulminate. Pentaerythritol tetranitrate is a major component of detonation cord and blasting caps. Phosphorus, potassium perchlorate, and metal nitrates are common ingredients of pyrotechnics, flares, and smokes. In particular, the heavy metals tend to accumulate in surface soils because of their generally low solubility and their elemental nature—they may oxidize or otherwise react with natural substances, but do not break down in the manner of organic compounds.

#### 3.4.2.1.3 Explosives Residues

The explosive residues generated when ordnance functions as designed (high-order detonation), or experiences a low-order detonation, generate constituents of concern. A high-order detonation is a complete detonation of maximum velocity that consumes almost all explosive constituents. Low-order detonation is either incomplete detonation or detonation at lower than maximum velocity, and explosive constituents remain along with combustion byproducts. The major explosive residues of organic nitrated compounds such as RDX include water, carbon dioxide, carbon monoxide, and nitrogen (Brinkley and Wilson 1943; John 1941 and 1943; Renner and Short 1980; Cook and Spillman 2000). High-order detonations result in almost complete conversion of explosives (99.997 percent or more [U.S. Army Corps of Engineers 2003]) into such inorganic compounds, whereas low-order detonations result in incomplete conversion (i.e., a mixture of the original explosive and its byproducts). For example, Table

3.4-5 lists the calculated chemical byproducts of high-order underwater detonation of RDX and Composition B, the military-grade mixture of RDX and plasticizers.

**Table 3.4-5: Chemical Residue Composition of Underwater Detonations**

| Component | Percent by Weight, by Explosive Compound | |
|---|---|---|
| | RDX | Composition B |
| Nitrogen | 37.0 | 29.3 |
| Carbon dioxide | 24.9 | 34.3 |
| Water | 16.4 | 8.4 |
| Carbon monoxide | 18.4 | 17.5 |
| Carbon (elemental) | - | 2.3 |
| Ethane | 1.6 | 5.4 |
| Hydrogen | 0.3 | 0.1 |
| Propane | 0.2 | 1.8 |
| Ammonia | 0.9 | 0.6 |
| Methane | 0.2 | 0.2 |
| Hydrogen cyanide | <0.0 | <0.0 |
| Methyl alcohol | <0.0 | - |
| Formaldehyde | <0.0 | <0.0 |
| Other compounds | <0.0 | <0.0 |

Note: < indicates "less than"

Source: Renner and Short 1980.

Field studies conducted by the U.S. Army indicate that explosives residues include 0.003 percent or less of the original quantity of material detonated, although the amounts of explosives residues vary among different types of ordnance. Land-based studies show that, for large ordnance items such as bombs, high-order detonations may spread very small residual particles in the micron and submicron-sized range over hundreds of square meters. Individual quantities of explosives used at SSTC are much smaller than those tested by the Army, however, so the amount of original detonation material is smaller and the explosive velocity is lower. Given the nature of training events at SSTC, low order detonations, while possible, are not the desired training outcome and any remnants are retrieved to the greatest extent practical.

### 3.4.2.2 No Action Alternative

#### 3.4.2.2.1 Hazardous Materials

#### Munitions

Various types of small, expendable training items are shot, thrown, dropped, or placed within the training areas. These items include smoke grenades, and flares of various types. These items are used in relatively small quantities for selected training activities, and are scattered over a large area. Recognizable items such as smoke grenades expended on the beach are collected, to the extent practicable, at the conclusion of the exercise. Items that are expended on the water, and fragments that are not recognizable as training materials (e.g., flare residue), generally are not collected.

Under the No Action Alternative, about 3,520 smoke grenades and flares are used at SSTC (Appendix C). At an average weight of about 0.85 pound per item (DoN 2008), about 2,990 pounds per year of these wastes (3,520 x 0.85 pound each = 2,990 pounds) would be generated. Solid flare and pyrotechnic residues may contain, depending upon their purpose and color, aluminum, magnesium, zinc, strontium, barium, cadmium, and nickel, as well as perchlorates. Although pyrotechnic residues include hazardous constituents, most of them are present in small amounts or low concentrations, and are bound up in insoluble compounds. As inert, incombustible solids, with low concentrations of leachable metals, these materials do not meet the criteria for hazardous wastes.

Under the No Action Alternative, about 265,000 small arms rounds and simunitions (a non-lethal projectile used to simulate live fire) per year are fired at SSTC, including about 187,300 blanks, about 77,600 simunitions, and up to 150 shotgun shells (Appendix C). The blanks are assumed to leave no solid residues on the range. At an approximate weight of about 0.02 pound each, the expended simunitions of dye-coated plastics used during Close Quarter Combat (CQC)/Close Quarter Defense (CQD) training weigh about 0.8 tons. Expended materials accumulate in areas used for training activities, such as the CQC/CQD training facility. Exercise participants collect visible, expended training materials to the extent practicable.

Approximately 1,200-1,610 pounds per year of explosives (Appendix C) are used for surface and below water training (Table 3.5-7). The major byproducts of these detonations are nitrogen, carbon dioxide, water, and carbon monoxide. Only trace amounts of organic compounds are left following a detonation of explosives and are not expected to affect surrounding biological or physical resources.

### Petroleum Products and Other Chemical Use

Under the No Action Alternative, petroleum products and other materials are stored in bulk, primarily at SSTC-N NAB Coronado; all maintenance and fueling of vehicles and vessels involved in training occurs there. Quantities of hazardous materials appropriate to the particular training event are transported to SSTC training areas. Materials potentially present in the training areas include various fuels, oil and hydraulic fluids, batteries of various types; pyrotechnical devices such as flares and smoke grenades; explosive items such as blanks, blasting caps, and explosives; paint; and water treatment chemicals used for Reverse Osmosis Water Purification Unit (ROWPU) (Activity 50, Table 2-1) training (sodium hexamonophosphate, sodium hypochlorite, and citric acid in 5-gallon pails).

Unintended releases of hazardous materials could pose a risk primarily to on-site military personnel, and secondarily to individuals in adjacent areas. However, over a recent three-year period (2005-2007), there were only four training-related spills (one on land and three on the water) that totaled less than 40 gallons. A single spill (ruptured bulldozer hydraulic line) accounted for 35 gallons, or almost 90 percent of the total. The other spills included oily waste or fuel; onsite personnel responded using spill response materials, such as absorbent pads. Thus, when these materials are used as intended, and in accordance with the Navy’s safety policies and procedures, these materials do not pose a risk to on-site personnel or the community as active controls minimize spills and responses to spills are immediate.

### 3.4.2.2.2 Hazardous Wastes

Wastes from training activities at SSTC include waste petroleum products, used coolants, various types of expended training materials, brine and backwash from the ROWPU training, and batteries. Most of these waste types are nonhazardous, some (e.g., batteries) may qualify as universal wastes (wastes that are not designated as hazardous wastes, but containing materials that need to be prevented from release into the environment), and some of the wastes are hazardous under RCRA. Hazardous wastes are stored in satellite accumulation areas on SSTC and in a 90-day storage area at NAB Coronado, and transported along SR-75 by truck to regional hazardous waste TSD facilities. Under the No Action Alternative, SSTC would continue to produce similar quantities of hazardous wastes.

Hazardous wastes derived directly from SSTC training activities represent an insignificant portion of the volume of hazardous wastes shipped to regional and national waste disposal facilities. The State and

Federal government will continue to assure that such facilities have ample capacity to accommodate industrial, commercial, and governmental wastes in the future.

### 3.4.2.3 Alternative 1 (Preferred Alternative)

#### 3.4.2.3.1 Hazardous Materials

Under Alternative 1, the amount of hazardous materials used for training at SSTC would increase over the No Action Alternative. Thus, the quantity of hazardous materials transported to SSTC along SR-75 and the hazardous materials at SSTC would increase. However, the maximum quantities of these materials stored on-site would not increase, because the increases would not trigger the need for expanded storage facilities. Consequently, impacts to the on-base hazardous materials management system would be the same as under the No Action Alternative.

**Munitions**

Alternative 1 would generate substantially more expended munitions residues than the No Action Alternative. Under Alternative 1, about 5,190 smoke grenades and flares (Appendix C) would be used at SSTC, an increase over the No Action Alternative of about 48 percent. At an average weight of about 0.85 pound per item (DoN 2008), about 4,410 pounds per year of these wastes (5,190 x 0.85 pound each = 4,410 pounds) would be generated. Although pyrotechnic residues include hazardous constituents, these constituents are present in small amounts or low concentrations, and are bound up in insoluble compounds. As inert, incombustible solids with low concentrations of leachable metals, smoke and flare residues do not meet the criteria for hazardous wastes.

Under Alternative 1, about 343,000 small arms rounds and simunitions per year are fired at SSTC, including about 201,000 blanks, about 141,000 simunitions, and up to 1,400 shotgun shells. The blanks are assumed to leave no solid residues on the range. At an approximate weight of about 0.02 pound each, the expended simunitions of dye-coated plastics during CQC/CQD training weigh about 1.4 tons. Expended materials would accumulate in areas used for these training activities, such as in the CQC/CQD facility. Exercise participants would collect visible expended training materials to the extent practical.

About 2,451-3,480 pounds per year of explosives are used for surface and underwater training. As indicated in Table 3.4-4, the major byproducts of these detonations are nitrogen, carbon dioxide, water, and carbon monoxide. Only trace amounts of organic compounds would be left following an underwater detonation of explosives. At such concentrations, these substances would have no effect on water quality.

**Petroleum Products and Other Chemicals**

Under Alternative 1, the same types of petroleum products and other chemicals would be present on the beach during training exercises, and in the same quantities as the No Action Alternative. ROWPU training would continue at the same number of training activities as the No Action Alternative. Shore training activities requiring the presence of bulk chemicals would occur more frequently than the No Action Alternative. For these reasons, the potential effects of staging petroleum products and other bulk chemicals on the beaches during training would be somewhat greater than those described in the No Action Alternative.

#### 3.4.2.3.2 Hazardous Wastes

Under Alternative 1, SSTC would produce more wastes than are produced under the No Action Alternative. Wastes from training activities at SSTC would include waste petroleum products, used coolants, various types of expended training materials, brine, and backwash from the ROWPU training, and batteries. Most of these waste types would be nonhazardous, some (e.g., batteries) may qualify as universal wastes, and some of the wastes are hazardous under RCRA. Hazardous waste shipments to TSD facilities (primarily by truck along SR-75) would also increase. The number of hazardous waste satellite accumulation points and the size of the 90-day storage facility likely would not increase. The increase in waste generation would be accommodated within the existing management program. The maximum quantities of hazardous wastes stored on-site would not increase.

#### 3.4.2.4 Alternative 2

The only difference between Alternative 1 and Alternative 2 is that all SSTC-N oceanside beach training areas would be available for Navy training, regardless of time of year under Alternative 2. Therefore, impacts associated with Alternative 2 would be the same as those described above for Alternative 1. Increased access and availability at SSTC-N training areas would not increase the use of hazardous materials or wastes.

### 3.4.3 Proposed Mitigation Measures

No adverse effects associated with hazardous materials or wastes were identified; therefore no mitigation measures are warranted. However, current mitigation measures, including implementation of practices outlined in Navy plans (listed in Section 3.4.1.5) and the collection of expended training materials, would continue to be implemented.

### 3.4.4 Unavoidable Adverse Environmental Effects

There are no unavoidable adverse environmental effects associated with hazardous materials and wastes as a result of implementation of any of the alternatives.

### 3.4.5 Summary of Effects

Table 3.4-6 summarizes the effects of the No Action Alternative, Alternative 1, and Alternative 2.

**Table 3.4-6: Summary of Effects**

| Alternative | Effects |
|---|---|
| **No Action Alternative** | • Use of expendable training materials deposits small amounts of training materials on the land ranges. Most of the degradation products of these materials are nonhazardous inorganic materials and are collected where feasible at the conclusion of training. Only trace amounts of nonhazardous organic compounds are left following a detonation of explosives and are not expected to affect surrounding biological or physical resources.<br>• The Navy's existing hazardous materials management system is sufficient for handling hazardous materials needed for the baseline training activities.<br>• The Navy's existing hazardous waste system is sufficient for handling hazardous wastes generated by baseline training activities. |
| **Alternative 1** | • Under this alternative, the amounts of expended training materials would increase. The weight of expended flare and smoke canister residues would increase and the amounts of residues from detonations of underwater explosives would increase. Despite these increases, the amounts of expended materials would not have an adverse effect on physical or biological aquatic resources.<br>• The Navy's existing hazardous materials management system is sufficient for handling hazardous materials needed for the proposed training activities.<br>• The Navy's existing hazardous waste management system is sufficient for handling of wastes generated by the Proposed Action. |
| **Alternative 2** | • Impacts would be similar to those for Alternative 1. |
| **Mitigation Measures** | • The Navy's general instructions (e.g., OPNAVINST 5090.1) and training activity planning and review processes serve to ensure that hazardous materials and hazardous wastes are stored and handled appropriately. The Navy's current mitigation measures include its business plan (Section 3.4.1.3.1), *HWMP*, *NBC Hazardous Substance Release Integrated Contingency Plan* (DoN 2008), and *Regional Explosive HWMP* (Section 3.4.1.4.1). Navy personnel also collect expended training materials at the conclusion of a training activity to the extent practicable. |

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# 3.5 Water Resources

# 3.5 WATER RESOURCES

## 3.5.1 Affected Environment

### 3.5.1.1 Introduction

#### 3.5.1.1.1 Definition

This section addresses the sources, availability, and uses of surface waters and groundwater. Hydrology addresses bodies of water, water transfers, and the horizontal (geographic) and vertical (topographic) distribution of water within the environment. Water quality addresses the physical and chemical composition of water as affected by natural conditions and human activities. Hydrology is described to provide a basis for understanding the relationship between the Proposed Action and the water resources in the area of potential effect. Water quality is described to provide a basis for evaluating impacts from the possible release of pollutants from training activities such as use of vehicles, personnel movements, expenditures of training materials, and detonation of explosives.

#### 3.5.1.1.2 Regional Setting

The Silver Strand Training Complex (SSTC) is located on Silver Strand peninsula in southern San Diego County. To the east of the Silver Strand peninsula lies San Diego Bay, a large enclosed bay that is heavily used for recreational, commercial, industrial, and institutional purposes. To the west of the peninsula lies the Pacific Ocean. Ocean waters off SSTC—from Point Conception south to Mexico—are part of the Southern California Bight (SCB), which is influenced by two major oceanic currents: the southward-flowing, cold-water California Current and the northward-flowing, warm-water California Countercurrent (also known as the Davidson Current). The mixing of these two currents in the SCB strongly influences patterns of ocean water circulation and temperatures (Figure 3.5-1).

#### 3.5.1.1.3 Region of Influence

The Region of Influence (ROI) for marine water resources at SSTC can be partitioned into three areas: the bayside training zones within San Diego Bay (sandy beaches, mudflats, and the nearshore environment); the oceanside intertidal and nearshore training lanes of SSTC-North (SSTC-N), SSTC-South (SSTC-S), and the Breakers Beach and Zuniga Point portions of Naval Air Station North Island (NASNI); and the offshore ocean environment of SSTC-N and SSTC-S including the ocean anchorages. Freshwater resources include all surface water and groundwater on these properties.

### 3.5.1.2 Federal and State Regulations

#### 3.5.1.2.1 Federal Regulations

**Clean Water Act (CWA)**

Federal statutes play an important role in protecting surface and ocean waters, and preserving wetlands. The principal federal law on water quality is the Clean Water Act (CWA) (33 United States Code [USC] § 1251 et seq.). The CWA was enacted by Congress to restore and maintain the chemical, physical, and biological integrity of United States (U.S.) waters. The CWA is administered by the United States Environmental Protection Agency (USEPA).

The CWA protects the nation's waters from pollution by setting water quality standards for surface waters and by limiting discharges of pollutants into U.S. waters. The CWA also establishes permitting requirements for wastewater discharges to surface waters. The CWA prohibits the intentional discharge of hazardous substances, including petroleum products, into U.S. waters in quantities harmful to the public health or welfare, or to the environment. The CWA is the primary federal statute governing the discharge of dredge or fill materials into U.S. waters.


**Figure 3.5-1: California Current and Countercurrent**

Relevant CWA sections include:

- Section 303 requires States to establish and enforce water quality standards to protect and enhance beneficial uses of water for such purposes as recreation and fisheries;
- Section 304 requires USEPA to publish water quality criteria that reflect the latest scientific knowledge on the effects of pollutants in water;
- Section 313 requires federal agencies to observe State and local water quality regulations;
- Section 401 requires States to establish water quality standards for waters in the U.S. territorial sea. Section 401 further requires any applicant for a Section 404 permit to provide certification from the State in which the discharge originates that the discharge will comply with applicable water quality standards; and
- Section 404 regulates the discharge of dredged and fill materials into navigable waters of the U.S.

As required under the CWA, USEPA has established National Recommended Water Quality Criteria (NRWQC) (USEPA 2006). The NRWQC are recommended ambient concentrations of specific contaminants in marine waters necessary to protect ecological and human health. The criteria are not rules, and have no regulatory effect; however, they can be used to develop regulatory requirements, based on concentrations that will have an adverse effect on the qualities necessary to sustain beneficial uses of U.S. waters. Table 3.5-1 shows the NRWQC for hazardous constituents that may be present in wastes generated by activities described in this Environmental Impact Statement (EIS).

**Table 3.5-1: NRWQC for Saltwater**

| Contaminant | Concentration (µg/L) | |
|---|---|---|
| | Maximum[a] | Chronic[b] |
| Nickel | 74.0 | 8.2 |
| Lead | 210.0 | 8.1 |
| Cadmium | 40.0 | 8.8 |
| Copper | 4.8 | 3.1 |
| Mercury | 1.8 | 0.94 |

Notes: µg/L - micrograms per liter; (a) the maximum concentration is an estimate of the highest concentration to which an aquatic community can be exposed briefly without resulting in an unacceptable effect; and (b) the chronic concentration is an estimate of the highest concentration to which a marine community can be exposed indefinitely without resulting in an unacceptable effect.
Source: USEPA 2006

### Rivers and Harbors Act (RHA)

The Rivers and Harbors Act (RHA) (33 USC § 401, 403) controls the construction of structures in navigable waters of the U.S. RHA Section 10 authorizes the U.S. Army Corps of Engineers (USACE) to regulate structures and works in, over, under, or affecting navigable waters of the U. S. For example, a Section 10 permit from USACE is required to place any permanent or temporary piles in navigable waters. The RHA defines navigable waters as those waters subject to the ebb and flow of the tide, and which were used, are now used, or may be used for interstate or foreign commerce. USACE jurisdiction extends to the ordinary high water mark of navigable waters.

### 3.5.1.2.2 State Regulations

The State of California’s principal law on water resources is the Porter-Cologne Water Quality Control Act (WQCA) (California Water Code §§ 13000-13999.10). The WQCA gives the State Water Resources

Control Board (SWRCB) and nine Regional Water Quality Control Boards (RWQCBs) responsibility for protecting the waters within their regions. The RWQCBs also implement provisions of the CWA delegated to states which regulates point (industrial) and nonpoint (storm water) sources of pollution.

The WQCA directs local RWQCBs to establish beneficial uses for water bodies in California; the WQCA controls water quality to ensure that these beneficial uses are not degraded. Under the authority of California law, the SWRCB has promulgated the *Water Quality Control Plan, Ocean Waters of California* (*Ocean Plan*) (SWRCB 2005), which contains numerical water quality objectives for protection of beneficial uses (Table 3.5-2).

**Table 3.5-2: California Ocean Plan Marine Water Quality Objectives**

| Contaminant | Concentration (µg/L) | |
|---|---|---|
| | Instantaneous Maximum | Six-Month Median |
| Nickel | 50 | 5 |
| Lead | 20 | 2 |
| Cadmium | 10 | 1 |
| Copper | 30 | 3 |
| Mercury | 0.4 | 0.04 |

Notes: µg/L - micrograms per liter.
Source: SWRCB 2005

Under California law, water quality criteria have been promulgated for the coastal watersheds of San Diego County (*Basin Plan*, RWQCB 2007); these criteria are analyzed to determine the significance of impacts on fresh water quality.

### 3.5.1.3 Hydrology

#### 3.5.1.3.1 Drainage Basin

SSTC and NASNI are part of the Coronado Subunit of the Otay Hydrographic Unit; the Coronado Subunit consists of Coronado Peninsula. No natural streams or major drainages occur within the Coronado Subunit although SSTC-S has wetlands, vernal pools, and natural and manmade drainage channels. Groundwater on Coronado Peninsula—because of its proximity to San Diego Bay and the Pacific Ocean—is too saline for potable uses (RWQCB 2007; DoN 1992). Accordingly, the *Basin Plan* exempts the Coronado Subunit from Municipal Groundwater as a beneficial use (RWQCB 2007).

#### 3.5.1.3.2 Floodplains and Wetlands

Coastal areas of NASNI that are less than 10 feet above mean sea level (msl) are within the 100-year floodplain (Figure 3.5-2). The 100-year flood is defined as the largest flood with a recurrence interval of 100 years or less, based on current topography, recorded precipitation, and tidal surge. The 100-year floodplain is the zone that would be subject to flooding during a 100-year storm event, combined with a very high tide or seismic ocean wave. SSTC is susceptible to flooding from local storm runoff or seismic ocean waves due to its low-lying, flat terrain.

A combination of low, sloping terrain, poor drainage, and a high water table create seasonal pools of storm water runoff in several depressions in the east-central and southern portions of SSTC-S (Department of the Navy [DoN] 2004). Runoff from an area of about 60 acres in the City of Imperial Beach and seawater infiltration during high winter tides contribute to the seasonal formation of these pools. Ditches connecting low-lying areas on the eastern portions of SSTC-S to culverts under State Route (SR)-75 drain to San Diego Bay, and drainage channels carry storm water runoff from the central

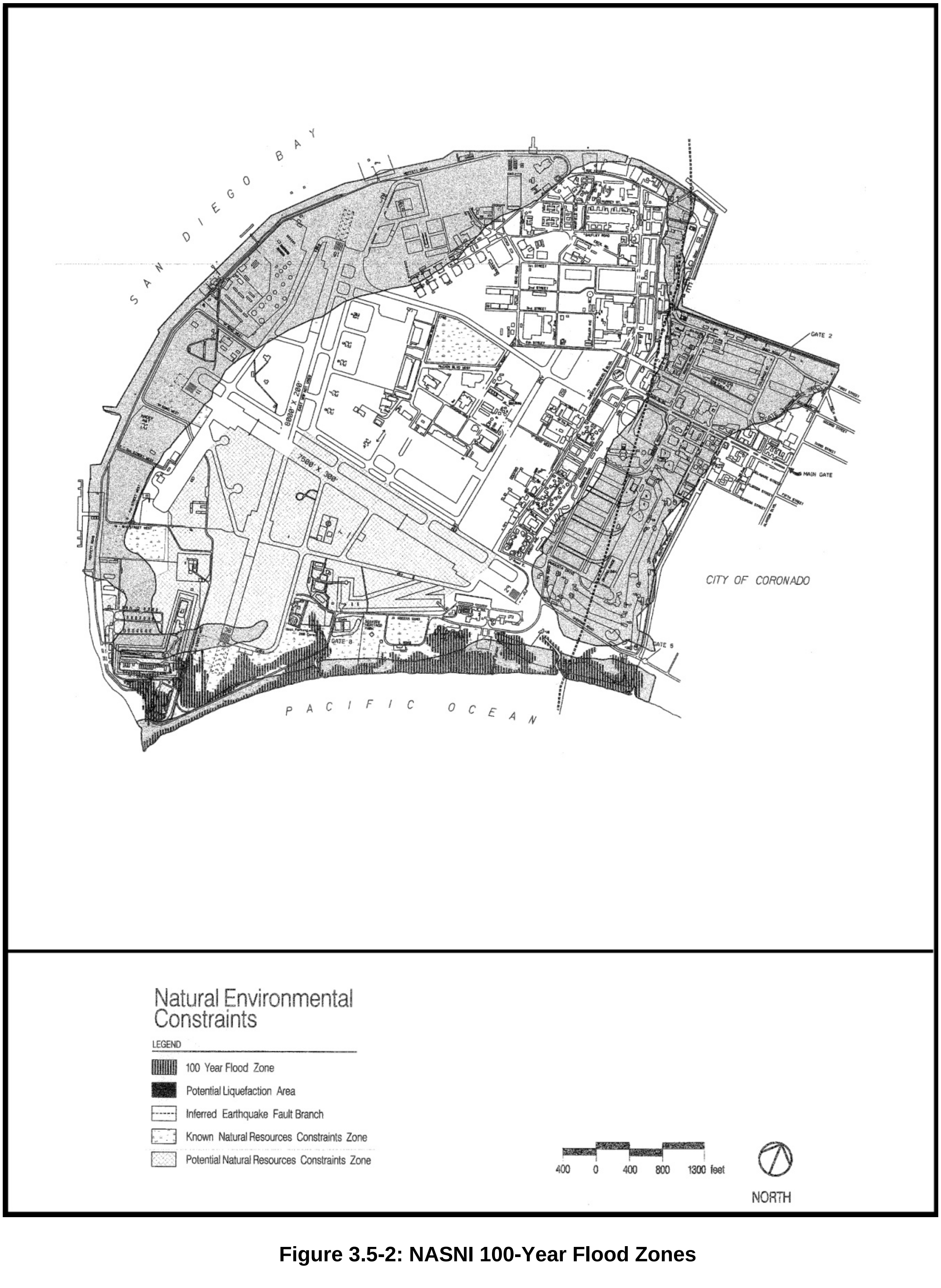


**Figure 3.5-2: NASNI 100-Year Flood Zones**

portions of SSTC-S to a sump pump at the YMCA Camp Surf that drains to the ocean. A USACE wetlands delineation in 2002 identified 59.6 acres of jurisdictional wetlands, mostly non-tidal pickleweed, and 11.3 acres of nonwetland U.S. waters on the site (shown in Section 3.11, Figure 3.11-11). A seasonal freshwater pond of about 0.7 acre, fed by storm water runoff from Imperial Beach, occupies the central portion of YMCA Camp Surf in the southwestern corner of SSTC-S.

#### 3.5.1.3.3 San Diego Bay

San Diego Bay (Figure 3.5-3) is a naturally formed, crescent-shaped embayment. It is separated from the Pacific Ocean by Silver Strand Peninsula, a long, narrow sand spit that extends from the City of Imperial Beach to North Island. The mouth of San Diego Bay is about 0.6 mile wide, and is aligned north-to-south between Point Loma and Zuniga Point. From the mouth of Otay River to the tip of Point Loma, San Diego Bay is about 15 miles long, and varies from 0.2 to 3.6 miles in width. It is 17 square miles in area at Mean Lower Low Water (Wang et al. 1998). The outer half of San Diego Bay is narrow, averaging about 0.6 to 1.2 miles, while the inner half is much wider, averaging about 2.0 to 2.4 miles.

Prior to major filling activities, which began in 1888 and intensified just before and during World War II, San Diego Bay had an area of 21 to 22 square miles, as defined by the mean high tide line of 1918. About six square miles of San Diego Bay, or about 27 percent, have been filled, based on this high tide line (Smith 1976). Only 17 to 18 percent of the original San Diego Bay floor remains undisturbed by dredge or fill (Smith 1976).

Several major freshwater basins drain into San Diego Bay. These basins include Sweetwater River, which drains to the south-central portion of San Diego Bay; Chollas Valley, which drains to the central portion of the Bay; and Otay River and Telegraph Canyon, which drain to southern San Diego Bay. In winter—when San Diego County receives most of its precipitation—fresh water enters San Diego Bay via storm drains, urban runoff, streams, and flood control channels. In summer, freshwater flows into San Diego Bay are minimal, and evaporation of water from the surface of the Bay increases. San Diego Bay is an "inverse" embayment—where evaporation exceeds freshwater inputs—creating a net inflow of ocean water.

### Bathymetry

With a water volume of approximately 287,000,000 cubic yards (Chadwick et al. 1999), San Diego Bay's depth ranges from 59 feet near the mouth, to less than three feet at the southern end. It has an average depth of 21 feet below msl (Wang et al. 1998). The northern area of San Diego Bay, generally north of Coronado Bridge, is deep—about 39 feet on average. In the central area of San Diego Bay, generally between Coronado Bridge and Sweetwater Flood Control Channel, water depth averages about 10 feet. In southern San Diego Bay, water depth generally is less than about eight feet, and deep water is found only in areas that were dredged for shipping channels.

There has always been a narrow, natural channel deepening at the mouth, possibly cut by river floods at a time when sea level was much lower (Peeling 1975). This channel continues to be deepened by dredging for safe passage of ships seeking sheltered anchorage at port. Figure 3.5-3 shows the most recently surveyed bathymetry of the San Diego Bay floor (Scientific Services 1994 for DoN). This map also shows the bathymetry of the nearshore oceanside of the SSTC, in seven-foot intervals.

### Hydrology and Hydrodynamic Regions of San Diego Bay

San Diego Bay circulation may be driven by wind, tides, temperature, and density gradients associated with seasonal, tidal, and diurnal cycles. In San Diego Bay, circulation is primarily related to tides, because winds are of mild magnitude and there is a low fetch (short distance for winds to pick up speed)

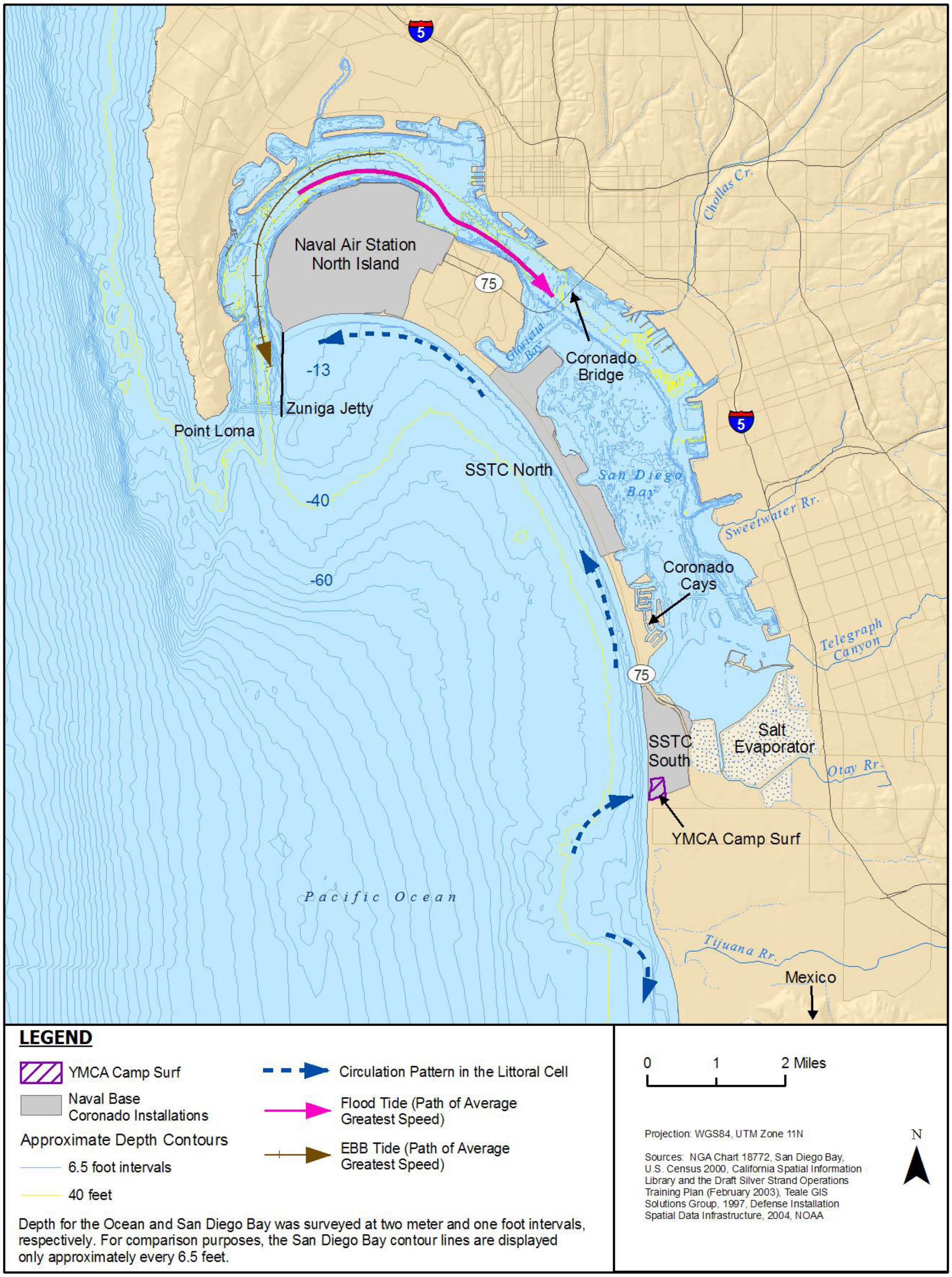


**Figure 3.5-3: Bathymetry and Circulation of San Diego Bay**

(Wang et al. 1998). Tides in San Diego Bay are classified as mixed diurnal/semi-diurnal, with the semi-diurnal component dominant (Largier 1995). Generally, the tides in San Diego Bay consist of two low and two high tides per day on an approximately two-week, spring-neap tidal cycle that is associated with the phase of the moon. Tides do not follow a 24-hour cycle, so some days experience only three of the four tides within the calendar day.

Driven by the ebb and flood of the tides, the currents in San Diego Bay change direction approximately every six hours (i.e., two flood and two ebb tides each day). Tidal currents are strongest near the mouth of San Diego Bay. Tidal current velocities decrease toward the head of San Diego Bay, due to the relatively smaller upstream tidal prism volume. In southern San Diego Bay, tidal currents are very weak (Largier 1995). Local winds can induce surface currents in San Diego Bay independent of tidal influences.

The mean tidal range—the difference between mean lowest low water and the mean highest high water—is about 5.7 feet and the maximum tidal range is about 10 feet (DoN 1998). Near SSTC, the average tidal range is about three feet. The strength of the tides affects the rate at which San Diego Bay is flushed (i.e., San Diego Bay water exchanged with ocean water). Flushing rates during minimum tidal exchanges can be one-third to one-fourth the rates observed during maximum tidal exchanges.

Tidal exchange in San Diego Bay exerts control over the flushing of contaminants, salt and heat balance, and residence time of water (Chadwick 1997). The ebb and flood of tides mix ocean and San Diego Bay waters. Tides produce currents, induce changes in salinity, and alternately expose and wet portions of the shoreline. Tidal flushing and mixing are important for dispersing pollutants, maintaining water quality, and moderating water temperature that has been affected by exchange with the atmosphere or heating.

Based on the residence time of water in different areas from the mouth to the southern salt ponds, Largier (1996, 1997) described four hydrodynamic subregions of San Diego Bay:

- **Marine Region.** Circulation in the marine region is dominated by tidal exchange within the ocean. In San Diego Bay, this area of efficient flushing is within perhaps three to four miles of the entrance. Residence time of water in this portion of San Diego Bay is just a few days. The net result of these circulation patterns in San Diego Bay is the presence of cold, clean ocean water at depth (Largier 1996, 1997).

- **Thermal Region.** In the thermal region—still in northern San Diego Bay but extending to approximately Glorietta Bay—currents are driven primarily by surface heating. The vertical exchange of water results from entry of a cold, oceanic plug at depth with the flood tide, then the receding of warm, San Diego Bay surface water with the ebb tide.

- **Seasonally Hypersaline Region.** Between Glorietta Bay and Sweetwater Marsh National Wildlife Refuge (SMNWR) is a seasonally hypersaline region. Water is stratified by salinity gradients induced by evaporation.

- **Estuarine Region.** South of the SMNWR is an estuarine region where occasional inputs of freshwater discharge from the mouths of the Otay and Sweetwater Rivers. Residence time of water in this portion of San Diego Bay can exceed one month.

Variations in the width of San Diego Bay affect the strength of the tidal current. For example, currents are strong in the narrow region near Coronado Bridge. Drift studies indicate that pollutants spilled in this area would disperse rapidly. Conversely, pockets such as Glorietta Bay have average residence times much longer than nearby locations in the main San Diego Bay, inhibiting the dispersal of pollutants.

Ocean waves affect circulation, turbidity, and sediment transport. The height and frequency of waves also can affect the uses suitable for San Diego Bay waters. The narrow entrance to San Diego Bay protects its interior from ocean waves, so the surface of San Diego Bay is relatively calm except when strong local winds generate steep, short-period waves. Short-period waves in San Diego Bay can be two to three feet high (Michael Brandman Associates 1988).

### Temperature, Salinity, and Turbidity

Temperature and density gradients, both with depth and along a longitudinal cross-section of San Diego Bay, drive tidal exchange of San Diego Bay and ocean water beginning in the spring and continuing into fall. Salinities near the San Diego Bay entrance approach those of the Pacific Ocean. In contrast, salinities in southern San Diego Bay are greater than in the ocean in late summer, but can be lower in the winter following rain. Turbidity is elevated in bays and estuaries due to shallow depths, stream discharges, storm runoff, or algal blooms. Waters of San Diego Bay become more turbid, or less transparent, as distance increases from the entrance.

## 3.5.1.3.4 Pacific Ocean

### Offshore Currents

The oceanic circulation off the coast of California is dominated by a long-term mean southward flow associated with the California Current. The California Current (Figure 3.5-1) flows from north to south along the California coast. This cold-water current diverges from the coast at Point Conception and flows south along the edge of the continental shelf. This current is considered the western boundary of the SCB. Underlying the California Current at a depth of approximately 275 fathoms is the California Undercurrent, which flows northward.

In southern California, the current divides into a southward extension and a recirculating flow toward the coast. The north-flowing current, called the Davidson Current, flows northward between the California Current and the coast. As the Davidson Current approaches the Channel Islands and Point Conception, part of the current turns east and south along the coast. The recirculation forms a counterclockwise eddy that is present most of the year. This surface current pattern is sometimes referred to as the Southern California Eddy (SCE).

The strength and influence of the various currents in the SCB vary seasonally. Between July and November (the Oceanic period), the California Current dominates nearshore circulation, and the SCE is well developed. Between December and February (the Davidson period), the California Undercurrent becomes stronger, and partially displaces the California Current westward, weakening the SCE. Between March and June (the Upwelling period), longshore winds drive surface water offshore, and deeper, colder water moves onshore.

Currents move large amounts of water with varying levels of temperature, salinity, dissolved oxygen (DO), and nutrients in and out of the study area. These water movements vary in strength, and are influenced by weather patterns and seasonal variations. In addition, currents along the coast are influenced by coastline orientation, bottom topography, and tides. Kelp forests may slow ocean currents to one-third of their normal speed (San Diego Association of Governments [SANDAG] 2000).

### Littoral Circulation

Local currents in nearshore waters are complex and include longshore currents caused by waves striking the shore at oblique angles, which flow parallel to the shore, and cross-shore and rip currents, which move in an onshore-offshore direction. The combination of these currents makes up the littoral transport process. Overall, longshore currents produce a net drift and sediment transport (turbidity) from south to north. Wave exposure affects the receiver beaches from the south and west. The currents closest to shore vary in response to coastline orientation, bottom topography, and tides.

The nearshore ocean is an exposed, open subtidal area called the Silver Strand Littoral Cell (SSLC), which extends from south of the international border to the Zuniga Jetty at San Diego Bay for over 17 miles of coastal reach. The main features of this littoral cell are the coastal bluffs of the Playa de Tijuana in Baja California, the Tijuana River delta, and the broad sandy beaches of the Silver Strand. The shoal located adjacent to Zuniga Jetty impounds sand transported to the north along the Silver Strand beaches in the lee of Point Loma. Within the SSLC, variations in the seasonal wave energy elicit substantial sand movement both longshore and on- and offshore (SANDAG 2000). Silver Strand Peninsula, a sand spit deposited by a northward-bound eddy of the coastal current on the west, separates San Diego Bay from the Pacific Ocean. Sand transport along the beach in the SSLC generally has a net northward direction of 117,715 to 196,192 cubic yards per year (Moffatt & Nichol 2000).

Beach recession has occurred south of Coronado and at Imperial Beach. Historically, the sand transported was laid down from deposition emanating from the Tijuana River. Since the damming of the river in 1937, however, the sand supply has been cut off and beaches have undergone severe erosion (Peeling 1975) south of Coronado and at Imperial Beach. Zuniga Jetty, which runs parallel to Point Loma at the San Diego Bay inlet, was built to control erosion near the inlet, changing San Diego Bay’s hydrodynamic characteristics by diverting both northward-bound sediment and currents (Wang et al. 1998).

The coastal currents in the SSLC were measured between 1986 and 1988 for the Tijuana Oceanographic Engineering Study. The mean water flow was measured by current meters at 15 stations in U.S. and Mexican waters. These current meter data were augmented by satellite imagery and other studies (U.S. International Water and Boundary Commission [USIBWC] 1998).

Subsequently, flow patterns in this area were modeled (Hendricks 1988). The principal pattern is a relatively uniform longshore flow north and south along the coast; this pattern represented about 60 to 65 percent of the variance in current measurements. Another intermittent flow pattern is a recurring eddy south of Point Loma with a counterclockwise circulation of varying intensity that can extend six to nine miles offshore and approximately 11 miles along the shore. About 87 percent of the variability in current meter data is accounted for by these two patterns.

### Wave Action

Shoreline circulation is strongly influenced by wave action. Northerly swells during late fall, winter, and early spring are caused by northern storms, while southerly swells during summer and fall result from tropical storms and wind patterns. Wave data collected to the south of SSTC in Imperial Beach indicate that the predominant wave direction is from the west to southwest, with a nearly continuous northerly transport through Imperial Beach and along Silver Strand.

Ocean swells exert a significant influence upon the water column and nearshore bottom habitats. Wave energy (swell) initiates the resuspension and transport of bottom sediments. The highest wave height and energy tend to be during winter and spring due to storms from the North Pacific (SANDAG 2000).

### Upwelling and Stratification

Upwelling occurs when northern winds displace surface waters offshore, resulting in replacement by colder, deeper waters. These colder waters have lower DO concentrations, but they have higher salinity and are richer in nutrients. Upwelling occurs from late March through July in San Diego County.

Downwelling occurs when southern winds push offshore waters toward the shore, thus pushing nearshore surface waters down and causing warmer waters and lower salinity than is typical for deeper waters. Nearshore water visibility ranges between 5 and 20 feet; however, visibility is substantially reduced in the surf zone by sediment disturbance from wave action and rip currents. Intertidal waters of beaches are characteristically turbid due to the high energy activity in the nearshore environment (SANDAG 2000). Seasonal upwelling and downwelling affect marine water quality within the nearshore ocean environment.

Waters are stratified in terms of temperature during the summer and early fall, unstratified during the winter, and transitional (e.g., stratification weakening or strengthening) in late fall and spring. Thermoclines are barriers to mixing between surface and bottom waters. Surface water temperatures are highest from June through September and lowest from November through February. In contrast, temperatures near the bottom generally are higher from October through January and lower from April through June. Historical temperatures in the study area range from 52 to 74 degrees Fahrenheit (º F) near the surface and from 49º to 61º F near the bottom. Water temperatures near the beach tend to be more uniform throughout the water column due to turbulent mixing and shallower depths (SANDAG 2000).

#### 3.5.1.4 Water Quality

The water quality of ephemeral pools, vernal pools, seasonal wetlands, and permanent pools on SSTC-S is unknown because the qualities of these waters have not been studied. To the extent that water quality affects the suitability of these habitats for plants and wildlife, this issue will be addressed in the discussion of biological resources. As discussed under Hydrology, no potable surface or ground waters exist on Silver Strand peninsula. Therefore, this discussion focuses on marine water quality.

SWRCB adopted the *California Ocean Plan* (*Ocean Plan*) in 1974, and amended it in 1988, 1990, 1997, 2001, and 2005 (SWRCB 2005). The *Ocean Plan* prescribes effluent quality requirements, management principles for waste dischargers, and specific waste discharge prohibitions.

The CWA prohibits the discharge of hazardous substances into or upon U.S. waters, out to a distance of 200 nautical miles. Historically, vessel discharge standards have been established individually by the coastal states. This state-by-state approach has proved to be problematic for the military. To resolve this issue, USEPA has proposed and is developing Uniform National Discharge Standards for military vessels. Table 3.5-3 summarizes current waste discharge restrictions for Navy vessels in the coastal zone (OPNAVINST 5090.1). Local Navy policy may be more restrictive than the limits shown in Table 3.5-3.

**Table 3.5-3: Discharge Restrictions for Navy Ships**

| Waste Type | Criteria For U.S. Waters (0-3 nautical miles) |
|---|---|
| Black Water (sewage) | No discharge |
| Grey Water (from sinks and showers) | If vessel is equipped to collect grey water, pump out when in port. If not, then direct discharge is permitted |
| Oily Waste | Discharge allowed if waste has no visible sheen. If equipped with Oil Content Monitor, discharge if < 15 parts per million of oil. |
| Garbage | No discharge |
| Hazardous Materials | No discharge |
| Medical Wastes | No discharge |

Source: OPNAVINST 5090.1, Section 22, Environmental Compliance Afloat.

#### 3.5.1.4.1 San Diego Bay

Marine water quality is determined by complex chemical and physical processes. Its dynamic equilibrium is evident in a variety of indicators, including temperature, salinity, and DO and nutrient concentrations. The major constituents of sea water are water, sodium chloride, dissolved gases, minerals, and nutrients. Table 3.5-4 lists the major mineral components of seawater.

**Table 3.5-4: Mineral Composition of Sea Water**

| Constituent | Concentration (Parts per million) | Constituent | Concentration (parts per million) |
|---|---|---|---|
| Chloride | 18,890 | Bromide | 65 |
| Sodium | 10,560 | Strontium | 13 |
| Sulfate | 2,560 | Boron | 4.6 |
| Magnesium | 1,272 | Fluoride | 1.4 |
| Calcium | 400 | Aluminum | 0.16-1.9 |
| Potassium | 380 | Barium | 0.05 |
| Bicarbonate | 142 | Silicate | 0.04-8.6 |

Note: Several other minerals are present in seawater at concentrations less than 1.0 part per million

Source: U.S. Geological Survey 1983.

Pertinent chemical characteristics of marine waters include temperature, salinity, and density, and the concentrations of hydrogen ions (pH), DO, and nutrients. The major ions present in seawater are sodium, chloride, potassium, calcium, magnesium, and sulfate. Seawater has a high buffering capacity, due primarily to the presence of dissolved carbon and hydrogen. Most of the dissolved carbon in the sea originates from the equilibrium reaction of dissolved carbon dioxide ($CO_2$) and water. This $CO_2$-carbonate balance buffers seawater, keeping the pH between 7.5 and 8.5.

Primarily, water quality in north-central San Diego Bay is affected by tidal flushing and currents. Water quality also is influenced locally by freshwater inflows. Portions of San Diego Bay are listed as impaired water bodies by the RWQCB due to excessive concentrations of one or more contaminants (RWQCB 2007).[1] A total of 172 acres of San Diego Bay are designated as contamination hot spots, which are a management priority in the total maximum daily load process. Hot spots are identified as having toxic sediments and degraded benthic communities, due to both point and non-point sources. The hot spots closest to SSTC are at Glorietta Bay and Coronado Cays.

Gross water quality characteristics (e.g., salinity, temperature, and DO) form a gradient within San Diego Bay: waters in northern San Diego Bay being similar to ocean conditions; waters in southern San Diego Bay being strongly affected by shallow depths, fresh water inflows, and insulation; and waters in central San Diego Bay being intermediate in character.

### Temperature

Water temperature is an important physical characteristic of the marine environment. Temperature controls the rate at which chemical reactions and biological processes occur (Waller 1996). Temperature also strongly influences vertical stratification and mixing. Most aquatic organisms thrive within a narrow range of temperature. A greater number of species live in the moderate temperature zones, with fewer

[1] Impaired waters are those waters that do not meet water quality standards for one or more pollutants; thus, they are impaired for their designated use.

species tolerant of extremes in temperature. The massive volume of large water bodies moderates the rate at which their temperature changes in response to natural processes, and marine organisms typically cannot survive rapid or substantial temperature fluctuations.

Surface water temperatures in northern San Diego Bay range from lows of 54°F to 58°F in winter to highs of 71°F to 74°F in summer. Water temperatures in southern San Diego Bay tend to be warmer both in winter (59°F) and in summer (74°F). Vertical thermal stratification is well-developed in the waters off the mouth of San Diego Bay in summer, with temperature differences of about 18°F. In winter, vertical temperature differences are about 3.6°F.

### Dissolved Oxygen

The amount of DO present in seawater varies with the rate of production by plants, consumption by animals and plants, bacterial decomposition, and surface interactions with the atmosphere. When surface water sinks, it retains its store of oxygen (Waller 1996).

DO concentrations vary with season, depth, and location within San Diego Bay. Although no direct information is currently available, well-mixed areas within San Diego Bay, including SSTC training areas, should maintain DO concentrations similar to nearshore ocean conditions, which vary seasonally and vertically. Surface DO levels measured in 1988 ranged from 7.6 to 10.1 milligram per liter (mg/L) (Engineering Science 1988). In southern San Diego Bay, DO concentrations are affected by other environmental factors, such as limited water exchange rates and circulation, higher water temperatures, oxygen uptake by organisms, and consumption of oxygen by decaying organic matter. DO values in San Diego Bay as low as 5 mg/L have been reported (Michael Brandman Associates 1988).

### Salinity

Salinity is a measure of the salt (sodium chloride) content of seawater. The salinity of seawater is approximately 35 parts per thousand (ppt) of salt in water. Variations in the salinity of seawater are linked primarily to climatic conditions. The salinity of seawater is affected by freshwater inflow, temperature, evaporation, and depth.

Salinity varies most at the surface of the water. Evaporation increases the salinity of surface waters, while rain and inflows of fresh water from streams decrease salinity. Salinity is relatively constant in northern San Diego Bay because of high exchange rates with the ocean, but it can vary considerably in southern San Diego Bay. Salinity near the harbor entrance ranges from 32.8 to 33.7 ppt (Engineering Science 1988). Salinity in southern San Diego Bay ranges from 31 to 37 ppt, or nearly a 20-percent change.

Salinity also varies with the season. Water in San Diego Bay is much warmer and saltier than adjacent ocean waters in summer (Largier 1995). With increasing distance from the mouth of San Diego Bay (at least one tidal excursion), residence time increases to several days, and significant temperature gradients are observed. At longer residence times, the heat content is saturated and an evaporative increase in salinity occurs. These conditions are typical of low-inflow estuaries in California where, during the long, dry summer, evaporative losses exceed the supply of fresh water from precipitation and runoff. At such times, the salinity of San Diego Bay waters substantially exceeds that of the ocean—a condition called hypersalinity. Within this hypersaline regime, inverse circulation (net inflow takes place in a surface layer, and net outflow in a bottom layer) may be observed. In some areas, a small freshwater inflow persists during the dry season and an estuarine (brackish) regime occurs.

### Turbidity

Water clarity is measured in terms of the amount of turbidity (i.e., the amount of particulate matter in suspension in the water column). The turbidity of San Diego Bay waters is affected by phytoplankton blooms; inputs of fine sediments from surface runoff during and after storms; sediment resuspension by winds, waves, and human activities; and discharges from wastewater treatment plants. Consequently, an increase in turbidity can limit light penetration and the level of primary production. Turbidity in San Diego Bay varies both temporally and spatially. In general, water clarity is about 6.6 feet.

#### Contaminants

Major contaminants found in San Diego Bay include chlorinated hydrocarbons, polychlorinated biphenyls, toxic components of petroleum hydrocarbons, polynuclear aromatic hydrocarbons, heavy metals, and organotins such as tributyltin (DoN 1998). The sources of these compounds include effluents from non-point-source storm drain runoff (municipal and industrial); vessel-related contaminants from maintenance, antifouling paints (military, commercial, and private vessels), and marina discharges; and residues of prior industrial discharges. Recent sediment sampling in San Diego Bay near SSTC-N indicates that—while concentrations of some contaminants are elevated above background levels—no contaminants were present at concentrations which would adversely affect marine organisms (Port of San Diego 2002). The *Ecological Assessment of San Diego Bay* (City of San Diego 2003a) stated that "[i]n comparison to other bays and harbors in the Southern California Bight…San Diego Bay has relatively low levels of widespread contamination and has considerably less contamination than in decades past."

Sediment studies performed in 1998 and 2002 for dredging projects in San Diego Bay indicate that its sediments are substantially free of chemical contamination, compared to a reference site (Naval Oceans Systems Center 2002). Additional sediment samples were collected in December 2002 for a dredging project in San Diego Bay. Samples were collected to the project depth (plus two feet of overdredge) of 44 feet below mean low water. Concentrations of heavy metals in test sediments were comparable to the heavy-metal concentrations in the reference sample collected from the ocean. In general, man-made organic chemicals were either not detected in the sediment samples or were found in trace concentrations.

Sediment samples from the Tijuana Oceanographic Engineering Study indicate that organic carbon, biological and chemical oxygen demand, sulfides, total nitrogen, arsenic, lead, nickel, zinc, copper, chromium, cyanide, and dichlorodiphenyltrichloroethane (DDT) are highest in the northwestern portions of San Diego Bay. Sediments in the central areas of the Bay were highest in mercury, cadmium, silver, and phenol. Higher concentrations of nickel, zinc, copper, chromium, and DDT were found in sediments adjacent to Tijuana Estuary (USIBWC 1998).

### 3.5.1.4.2 Pacific Ocean

Ocean water quality offshore of the Silver Strand peninsula is influenced by natural conditions such as thermal stratification, upwelling, tides, and currents; by surface runoff and river discharges; and by wastewater discharges. Three wastewater treatment plants in the region discharge treated wastewater to the Pacific Ocean via two outfalls. Point Loma Wastewater Treatment Plant has an ocean outfall north of Coronado that discharges wastes at a location 4.5 miles offshore at a depth of 320 feet. South Bay Reclamation Plant and International Wastewater Treatment Plant have an ocean outfall that discharges wastes at a location 3.5 miles offshore at a depth of 100 feet.

#### Temperature

In the waters offshore of SSTC, seasonal thermoclines (water layers of markedly differing temperatures) stratify the water column. Surface temperatures are more affected by atmospheric conditions, and tend to fluctuate along lines of latitude. Surface water temperatures vary seasonally in association with upwelling, climatic conditions, and latitude. Water temperatures closer to the coast tend to be more uniform throughout the water column due to turbulent mixing and shallower depths. Nearshore locations are shallower and have slightly higher temperatures.

Warming by the sun is the primary factor that affects surface water temperatures in southern California from June to October. Surface water temperatures are highest from June through September and lowest from November through February. Temperatures near the bottom are higher from October through January and lower from April through June. Waters are stratified during the summer and early fall, unstratified during the winter, and transitional (e.g., stratification weakening or increasing) in late fall and spring. Thermoclines limit the mixing of surface and bottom waters.

Baseline monitoring of ocean conditions for South Bay International Wastewater Treatment Plant between July 1995 and June 1996 showed that mean bottom temperatures at the 90-foot depth stations increased from about 52°F in July to about 58°F in December, and then declined to a range of about 52°F to 55°F in winter and spring. Mean surface temperature increased from about 62°F in July to about 71°F in September, and declined to about 58°F in February. In May and June, mean surface temperatures began to rise to about 52°F and 69°F, respectively (USIBWC 1998). Surface temperatures of waters along the coast of the SCB range from about 54°F in the winter to about 70°F in the summer. Temperatures of bottom waters in the study area range from about 49°F to 61°F.

### Dissolved Oxygen

Historical DO concentrations range from 5.0 to 11.6 mg/L throughout the SCB. Surface water DO concentrations at sites off San Diego were 7.8 mg/L and 8.3 mg/L during a June 1999 survey (SANDAG 2000). The bottom water DO concentration at surveyed locations was 8.6 mg/L. Surface and nearshore waters generally have higher concentrations of DO due to continuous wave action and atmospheric mixing. A DO level equal to or greater than 5 mg/L has been recommended as a general standard of acceptable water quality for aquatic life.

During baseline monitoring for the South Bay Ocean Outfall, offshore DO concentrations decreased with depth and distance from shore, and mean high values were highest during the summer and fall. At a depth of 90 feet, mean concentrations in summer ranged from 7.7 to 8.8 mg/L. A high mean value of 8.9 mg/L was recorded in October. DO concentrations declined in winter and then increased in the spring, except during April, when the lowest recorded value of 6.9 mg/L occurred due to upwelling (USIBWC 1998).

### Salinity

Historically, salinity has been fairly uniform, ranging from approximately 32 to 34 ppt throughout the SCB. Salinity tends to be homogenous throughout the water column; with differences between the surface and the bottom typically less than one ppt. Salinity of both surface and bottom waters may be slightly higher from April to August due to upwelling of denser bottom waters. Maximum thermal stratification was observed in June 1996, when salinity was 33.7 ppt at the surface and 38.3 ppt at a depth of 180 feet. In December 1996, the range of salinity was narrow and inverted, with a value of 33.4 ppt at the surface and 33.4 ppt at 180 feet. There were insufficient data to explain the inversion, and upwelling did not appear to be a factor (USIBWC 1998).

### Turbidity

Ocean water quality parameters monitored by the City of San Diego (see "Contaminants" discussion below) include Total Suspended Solids (TSS), a measure of turbidity, oil and grease, and sediment quality. Monitoring data indicate that the waters offshore of Silver Strand typically have higher-than-average levels of TSS (e.g., 11.5 to 23.2 mg/L in 2002) and low levels of oil and grease. Tidal flushing of San Diego Bay is responsible for higher levels of turbidity beyond the Bay's entrance, and increased turbidity in shallow waters in September and October are associated with seasonal phytoplankton blooms (red tides).

### Contaminants

The City of San Diego Metropolitan Wastewater Department has monitored water quality offshore of Silver Strand since 1999 under the City's South Bay Ocean Outfall, located south of the Tijuana River estuary on the U.S-Mexico border. Ocean water quality monitoring by the City over the last three to five years provides a good understanding of typical water quality conditions in the area of potential effect. Local ocean water quality is generally good, with episodes of poor water quality associated with heavy storm runoff and sewage spills.

The County Health Department closes public beaches to water-contact recreation when coliform bacteria counts indicate a potential risk to public health. The number of closures per year is shown in Table 3.5-5 for three locations along Silver Strand. The number of days that the beaches are closed increases from north to south, and most closures are associated with a sewage spill or possible sewage spill. The data indicate that Tijuana River and South Bay Ocean Outfall discharges strongly influence water quality in this area. Storm water runoff has a relatively minor influence on local water quality.

**Table 3.5-5: Beach Closures Due to High Coliform Bacteria Levels**

| Location | Beach Closures By Calendar Year (Days) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 2003 | | 2004 | | 2005 | | 2006 | |
| | S | R | S | R | S | R | S | R |
| NASNI Beach | 0 | 0 | 9 | 0 | 15 | 0 | 1 | 0 |
| Silver Strand State Beach | 4 | 0 | 21 | 4 | 31 | 0 | 11 | 0 |
| YMCA Camp Surf | 20 | 4 | 50 | 0 | 80 | 2** | 55 | 0 |

Notes: S - caused by sewage spill or possible sewage spill; R - attributed to storm water runoff. ** - cause unknown.
Source: County of San Diego Department of Health 2005, 2006.

Sediments offshore of Silver Strand have above-average levels of organic loading and concentrations of some metals (aluminum, arsenic, chromium, copper, iron, manganese, and zinc), but they are not present at concentrations that pose a risk to public health or the environment. Traces of synthetic organic contaminants (e.g., polycyclic aromatic hydrocarbons) are occasionally detected in sediments, but to date have been well below a threshold of concern (USACE 2002).

### 3.5.1.4.3 Beneficial Use Designations

The RWQCB prepared a *Basin Plan* that identifies beneficial uses of local surface waters, water quality objectives necessary to protect designated beneficial uses, and water quality standards to achieve the objectives (RWQCB 2007). These designations address water quality, not the apportioning or consumption of the available resources. Thirteen beneficial uses of San Diego Bay and 12 beneficial uses of the Pacific Ocean are designated by the RWQCB. These beneficial uses are described in Table 3.5-6.

**Table 3.5-6: Designated Beneficial Uses of San Diego Bay and Pacific Ocean Waters**

| Beneficial Use | San Diego Bay | Pacific Ocean | Description |
|---|---|---|---|
| Industrial Service Supply | √ | √ | Industrial activities that do not depend primarily on water quality |
| Navigation | √ | √ | Shipping, travel, or other transportation |
| Recreation - Water Contact | √ | √ | Body contact water sports where ingestion of water is reasonably possible |
| Recreation - Non-Water Contact | √ | √ | Uses of water requiring proximity to water but not normally involving body contact |
| Commercial and Sport Fishing | √ | √ | Commercial or recreational collection of fish and other organisms, including those used for human consumption |
| Preservation of Biological Habitats of Special Significance | √ | √ | Uses of water that support designated areas or habitats, such as established refuges, parks, or sanctuaries where natural resources require special protection |
| Estuarine Habitat | √ | | Uses of water that support estuarine ecosystems, including preservation of estuarine ecosystems |
| Wildlife Habitat | √ | √ | Uses of water that support terrestrial ecosystems, including preservation of terrestrial ecosystems |
| Preservation of Rare and Endangered Species | √ | | Uses of water that support habitats necessary for the survival and maintenance of plant or animal species protected by state or federal laws. |
| Marine Habitat | √ | √ | Uses of water that support marine ecosystems, including preservation of kelp, fish, shellfish, and wildlife |
| Aquaculture | | √ | Aquaculture and mariculture of plants and animals for human consumption or bait. |
| Migration of Aquatic Organisms | √ | √ | Uses of water that support habitat necessary for migration |
| Spawning, Reproduction, and Early Development | √ | √ | Uses of water that support high quality aquatic habitats suitable for reproduction and early development of anadromous fish. |
| Shellfish Harvesting | √ | √ | Uses of water that support habitats suitable for collection of filter-feeding shellfish for human consumption or commercial or sport purposes. |

Source: SDRWQCB 2007

The SWRCB's *Ocean Plan* guides the management and protection of offshore marine water quality in California (SWRCB 2005). The *Ocean Plan* designates several beneficial uses of ocean waters along the San Diego coast: shellfish harvesting, industrial water supply, water recreation, navigation, fishing, mariculture, preservation and enhancement of Areas of Special Biological Significance (ASBS), rare and endangered species, marine habitat, fish migration, and fish spawning (these Pacific Ocean uses also are designated in the *Basin Plan*). The *Ocean Plan* identifies two ASBS's in the San Diego region: the San Diego - La Jolla Ecological Reserve and the San Diego Marine Life Refuge. Both of these locations are north of Point Loma; the ROI for SSTC does not contain any ASBS.

### 3.5.1.5 Water Use

#### 3.5.1.5.1 San Diego Bay

The diverse uses of San Diego Bay waters include ocean shipping, transportation, tourism, military use for Navy and U.S. Coast Guard, and recreational boating and fishing. No commercial fishing occurs in

San Diego Bay. A portion of central San Diego Bay offshore of Naval Amphibious Base, Main Base is designated as a Restricted Area in the Code of Federal Regulations (Figure 3.16-2 in Section 3.16, Public Health and Safety). A large rectangular area in central San Diego Bay is designated for regattas; this regatta area lies partly within the Navy's designated restricted area. The *San Diego Bay Integrated Natural Resources Management Plan* (Port of San Diego and DoN 2007) attempts to quantify the use of San Diego Bay waters in terms of ship traffic. On the basis of shore-based visual surveys of portions of San Diego Bay and interviews with users, estimates of annual ship traffic for four categories of vessels (commercial, recreational, Navy vessel, and Navy small boat) were made for each cell of a grid superimposed on San Diego Bay. This analysis indicates that portions of San Diego Bay used for SSTC training activities are not used by commercial or Navy vessels. Recreational boat traffic in these areas was estimated at less than 1,000 boats per year, and Navy small boat traffic was estimated at between 1,000 to 2,500 boats per year.

Assuming for analytical purposes that most of the recreational boat traffic occurred on weekends, that central San Diego Bay represented roughly 35 percent of the 17 square miles of San Diego Bay surface, and that most of the boat traffic occurred over an eight-hour period, then the density of recreational boat traffic is about 0.2 boat per square mile. Based on the same assumptions, Navy small boat density is about 0.5 boat per square mile. These rough estimates indicate that the potential for conflicts between SSTC training activities and public use of San Diego Bay waters is negligible, and need not be further addressed.

#### 3.5.1.5.2 Pacific Ocean

Public uses of Pacific Ocean waters adjacent to SSTC are broader than those of San Diego Bay, including swimming, snorkeling, surfing, Self-contained Underwater Breathing Apparatus (SCUBA) diving, and commercial fishing in addition to those listed for San Diego Bay. Little useful data on the public use of this area are available. An EIS prepared for the City of Imperial Beach (*Silver Strand Shoreline Final General Reevaluation Report*, USACE 2002) provides the following annual estimates of use for shore and nearshore recreation along its 3.5 miles of beach front:

- 1.8 million beach goers,
- 8,000 beach anglers, and
- 400 fishing boats providing an estimated 10,000 fishing trips.

While these data may be useful for the city's land use and socioeconomic planning purposes, they do not provide quantitative information on the actual use of ocean waters off Imperial Beach, and may not be representative of other beach areas, such as Silver Strand State Beach or Coronado Municipal Beach.

### 3.5.1.6 Current Mitigation Measures

The Navy's current practices affecting water quality—primarily hazardous materials handling and waste disposal practices—are based on requirements in OPNAVINST 5090.1. Those requirements were developed to comply with federal environmental regulations. Efforts to preserve vegetation on the backsides of dunes along the shoreline may reduce erosion and reduce transport of sediments into adjacent surface waters. Collection of spent training materials at the conclusion of training activities may incrementally reduce the amounts of contaminants transported into adjacent waters.

With respect to water use, the Navy mitigates potential effects by avoiding washing causeway pier sections in the ocean and by pumping seawater through its Offshore Petroleum Discharge System (OPDS) during training instead of using petroleum products. OPNAVINST includes guidance on shipboard operations afloat.

## 3.5.2 Environmental Consequences

### 3.5.2.1 Approach to Analysis

This resource section focuses on groups of activities that could affect hydrology, water quality, or designated beneficial uses of water. As discussed in Chapter 2, similar types of activities are grouped together (agglomerated) for ease of analysis. Types of activities that could affect hydrology are those that alter topography or bathymetry. Types of activities that could affect water quality are those that could increase turbidity or increase concentrations of water pollutants. Types of activities that could affect designated beneficial uses are those that alter water quality in a way that affects commercial, recreational, or institutional uses of ocean, bay, or wetland areas (the area has no groundwater resources to be affected). Activities that do not have the potential to adversely affect water resources—and are not addressed below—include 17, 19, 31, 36, 43, 47, 58, 59, 61-63, 65, 66, 68, 72, 74-76, and N11 (Table 2-1 and Table 2-2).

### 3.5.2.2 Approach to Analysis

Factors considered in evaluating the effects of an alternative on surface hydrology include the extent to which the Proposed Action or alternatives would:

- Substantially alter surface hydrology on land ranges to the detriment of the physical environment (i.e., result in substantial flooding or ponding of surface runoff); or
- Violate laws or regulations established to protect or manage water resources (see discussion of CWA and RHA, Section 3.5.1.2.1).

Factors considered in evaluating the effects of an alternative on water quality include the extent to which the Proposed Action or alternative would:

- Produce concentrations of chemicals in fresh waters that exceed criteria in the *Basin Plan* (see discussion of *Basin Plan* in Section 3.5.1.2.2)*;*
- Produce concentrations of chemicals in marine waters that exceed Ocean Plan objectives (Table 3.5-2), or
- Substantially affect existing or future beneficial uses (see Section 3.5.1.4.3 for a discussion of these regulatory designations under the RWQCB's *Basin Plan* and *Ocean Plan*).

Factors considered in evaluating the effects of an alternative on water use include the extent to which the Proposed Action or alternatives would:

- Conflict with public use of state or federal waters, or
- Otherwise discourage public use of state or federal waters.

No federal or state regulations seek to apportion use of San Diego Bay or ocean waters between public and institutional uses. Federal regulations pertaining to public safety and homeland security are addressed in Section 3.16, Public Health and Safety.

### 3.5.2.3 No Action Alternative

#### 3.5.2.3.1 Hydrology

The surface hydrology of SSTC, including seasonal wetlands and USACE jurisdictional wetlands, is described in Section 3.5.1.3.2. Training activities at SSTC do not permanently alter topography or surface flows.

Certain training activities result in minor topographic alterations of the SSTC beaches (e.g., OPDS Beach Termination Unit, Amphibious Bulk Liquid Transfer System [ABLTS] Beach Interface Unit and Causeway Pier Insertion and Retraction; Activities 38, 30, and 41, respectively [see Table 2-1]), but disturbed areas are graded to restore the pre-existing conditions at the conclusion of the training exercise. Landing craft cause temporary, minor alterations in bottom topography at the shoreline that are eventually restored to their natural contours by wave action and currents. Piles placed in the water during Elevated Causeway System (ELCAS) training (Activity 42, Table 2-1) create some local turbulence during the short periods they are in place (see discussion below). Fluid transfer training activities (Reverse Osmosis Water Purification Unit [ROWPU], Activity 40, Table 2-1) withdraw small amounts of seawater from the surf zone and discharge similar quantities at another location.

OPDS (Activity 38, see Table 2-1), consists of a two-mile-long underwater conduit anchored to the sea floor; when deployed and anchored, OPDS disturbs and resuspends bottom sediments. OPDS presents a minor barrier to currents and the natural movement of sediments when in place. This activity occurs an average of up to six times per year, the conduit is in place for nine days during each exercise—for a total of 54 days per year—and the conduit is not placed in the same location during each training event; therefore, this activity has no long-term effects on the ocean bottom. During training, seawater rather than petroleum products is pumped through the system, eliminating any risk of accidental leaks or spills of petroleum.

The placement of piles in shallow water during ELCAS training (Activity 42, see Table 2-1) requires a Rivers and Harbors Act Section 10 permit and may require a CWA Section 404 permit from USACE. Before issuing a Section 404 permit, USACE requires a Section 401 Water Quality Certification, which is issued by the RWQCB. This activity occurs two times per year, and each training event lasts 14 to 28 days. The piles create small depressions in the sea floor and obstruct water flow, but to an insignificant degree because the piles have a small cross-section. When the pile is being driven and extracted, ocean bottom sediments are disturbed, substantially increasing turbidity near the pile; however, this is a local and temporary effect. In addition, the Causeway Pier Insertion and Retraction (Activity 41) would require a Section 404 permit (and thus also a Section 401 water quality certification) because it requires excavation and fill below the high tide line, and may require a Section 10 permit because it would temporarily obstruct navigable waters of the United States.

Effects of training activities on soil erosion and sediment transport are addressed in Section 3.2, Geology and Soils.

#### 3.5.2.3.2 Water Quality

Silver Strand peninsula has no potable surface or groundwaters, so SSTC training activities do not affect freshwater water quality. The water quality analysis is focused on the potential effects of the training activities on the marine waters of San Diego Bay and the nearshore Pacific Ocean. Water quality parameters of concern consist of physical characteristics—such as temperature, density, stratification, clarity, dissolved gases, and suspended sediments—and water pollutants. Military training activities at SSTC have no known effects on water temperature, density, stratification, or dissolved gases. Hazardous materials use, discharges of wastes, underwater detonations, and sediment resuspension, however, could affect turbidity (water clarity) and concentrations of water pollutants.

### Hazardous Materials

Training involves the use of fuels, engine oil, hydraulic fluids, batteries, flares, and explosives with hazardous constituents that may adversely affect water quality. Anti-corrosion coatings typically include cadmium. Anti-fouling paints may contain copper, and batteries may contain lead, cadmium, or mercury. These hazardous substances may be present in materials leaked or spilled in the water, or in runoff from surfaces flushed with water. They also may leach from surfaces in contact with the water.

#### *Petroleum Products*

Minor quantities of petroleum products, including fuel, oil, hydraulic fluids, and lubricants, may enter San Diego Bay and ocean waters during routine transit of Navy vessels and equipment conducting training activities. The hazardous constituents of petroleum products—such as fuels, engine oil, and hydraulic fluid—are hydrocarbons. The most toxic components of petroleum products are polycyclic aromatic hydrocarbons, such as benzene, toluene, xylene, and naphthalene. These chemicals are relatively volatile, and highly water-soluble. Used engine oil, fuel additives, and hydraulic fluids also may contain low concentrations of toxic metals such as chromium, cadmium, and nickel. The small quantities of these substances released into the environment are not anticipated to affect water quality.

Because of the number of potential sources and the stresses placed on personnel and equipment during training, small leaks or spills may occasionally occur due to equipment failure (e.g., burst hydraulic line) or human error. According to Navy spill reports, training activities at SSTC were responsible for four spills of primarily fuel and hydraulic fluid between 2005 and 2007. One spill was reported as 35 gallons of hydraulic fluid on the beach, and the other three spills were less than five gallons. Such spills are cleaned up by on-site personnel, using spill control equipment and supplies stored on Navy vessels, military vehicles, and military facilities. Thus, the unrecovered spill materials left in the water would be a small portion of the quantity originally spilled. Overall, the quantities of petroleum products leaked or spilled during training activities will likely be negligible.

#### *Coatings*

Concentrations of copper and other toxic constituents of marine vessel antifouling coatings are a concern in San Diego Bay, as are anode materials used in cathodic protection systems. Training activities, however, have little or no effect on concentrations of these substances in San Diego Bay and ocean waters. Training at SSTC does not affect the number of large Navy vessels stationed in San Diego or the length of time they are present. Smaller vessels and personal watercraft stored out of the water when not in use have insufficient contact time with the water to be a notable source of contaminants.

#### *Pyrotechnics*

While the SSTC EIS discusses cumulative increase in the quantity of smoke grenades and flares used in training events, the increase is quantified in terms of individual grenades and flares and not necessarily the small quantities of potentially hazardous substances. Greater than 95 percent of training events involving smoke grenades and flares will likely be associated with land or amphibious training events. There will be little use of smoke grenades or flares directly in or over water. Use per training event in which smoke and flares apply is also small (2-11 items). In addition, this use is spaced out both in time and space throughout the year and at various locations within SSTC meaning there is no spot concentration in usage.

From an environmental perspective, smoke grenade filler has approximately 11 ounces of a colored smoke mixture (white, red, yellow, green and violet). The smoke mixture is composed of a mixture of potassium chlorate, sodium bicarbonate, lactose and a dye, all of which are relatively environmentally benign. In addition, most of the filler is consumed during use. Chemical composition of military flares can be a combination of magnesium, boron, potassium perchlorate, and barium chromate (USAF 1994), or in some cases red phosphorus. Red phosphorus is a common ignition compound used for instance in matches. Red phosphorus is a relatively non-toxic compound, although highly flammable, and subject to environmental degradation in marine systems (Spanggord et al. 1985, European Flame Retardants Association 2010). In an analysis of military flares, the U.S. Air Force found that most of the common flare constituents were consumed during flare ignition. Residual ash from flares contained small quantities of magnesium and boron (USAF 1994). Measured values of magnesium in flare ash [86 part per million (ppm)] were found to be below the natural seawater composition of magnesium (1,290 ppm).

Potassium perchlorate was not a significant residue and not detected in ash samples measured. In the rare eventuality that any perchlorate were to remain, perchlorates are also highly soluble, and the ions have a limited tendency to interact with other dissolved chemical species or to adsorb to aquifer materials under typical environmental conditions (Clausen et al. 2007). Pechlorate in marine aquatic systems would be subject to significant bacterial degradation (Urbansky 1998, Logan et al. 2001, Brown and Gu 2006, Petrisor 2006, Wilkin et al. 2007).

Therefore, given the limited, short-term potential for smoke grenade and flare residuals to fall into San Diego Bay and the ocean and the relatively low levels of actual constituent released combined with natural environmental degradation of these compounds, the relative risk from use of these items is not significant.

A further comparison can be made to related pyrotechnics with substantially more constituents within the San Diego region. For example, San Diego Regional Water Quality Control Board (SDRWQCB) required water and sediment monitoring by Sea World due to daily firework displays over Mission Bay. On average, Sea World conducts 100-120 shows per year with each show using up to 250 shells, and up to 1,750 shells for special holidays (SDRWQCB 2007). In support of a concern for potential environmental contamination from fireworks residue, water and sediment samples were taken from 2001 through 2006 as part of a Coastal Commission permit requirement. Samples were analyzed for various constituents found in fireworks, including oxidizers (ammonium perchlorate and potassium perchlorate), metals (antimony, barium, copper, strontium), and salts (magnesium, sodium, etc.). The final monitoring report concluded that there were no significant spatial or temporal patterns in concentrations of critical metals in sea water or sediments in the small area of Mission Bay subject to repeated large-scale fireworks displays (SDRWQCB 2007).

#### *Explosives*

Under the No Action Alternative, SSTC training activities require the detonation of small amounts of explosives on the water surface and underwater. While up to 2,810 pounds of explosives are used each year for underwater detonations (Table 3.5-7), most of these training events occur on the open ocean side of SSTC.

**Table 3.5-7: Surface and Underwater Detonations - No Action Alternative**

| Activity[1] | | Events/Year[2] | Explosives (pound, NEW) | |
|---|---|---|---|---|
| # | Description | | Per Event | Per Year |
| 5 | Mine Countermeasures (MCM) | 32 (16) | 10 – 20 | 320 – 640 |
| 6 | Floating Mine | 25 (0) | 5 | 125 |
| 7 | Dive Platoon | 8 (2) | 8 x 3.5 | 224 |
| 9 | Very Shallow Water (VSW) MCM | 60 (60) | 0.1 - 20 | 6 – 1,200 |
| 10 | Autonomous Underwater Vehicle (AUV)/Unmanned Underwater Vehicle (UUV) Activities (3% of activities) | 4 (1) | 10 – 15 | 40 – 60 |
| 11 | Marine Mammal System (10% of activities) | 16 (10) | 13-20 | 312 |
| 12 | Mine Neutralization | 4 (4) | 8 x 3.5 | 112 |
| 37 | SEAL Delivery Vehicle/Advanced SEAL Delivery System | 14(4) | 10 | 140 |
| TOTAL[3] | | 163 (97) | – | 1,280 – 2,810[4] |

[1] See Table 2-1
[2] Total number of events (Total number of events scheduled for bottom detonations)
[3] Totals rounded to three significant digits; # - number
[4] Rounded to three significant digits

As discussed in Sections 3.4.2.1.1 through 3.4.2.1.3, high-order combustion products of typical military explosives used at SSTC such as Royal Demolition Explosive (RDX) and pentaerythritol tetranitrate (PETN) consume over 99.997 percent of the original explosive material during detonation with by-products of common inert gases and relatively inert inorganic salts. For example, exploding 10 pounds of Composition (C)-4, which is 91 percent RDX, produces about 3.7 pounds of nitrogen, 25 pounds of $CO_2$, 1.6 pounds of water, 1.8 pounds of carbon monoxide, 0.2 pound of ethane, 0.03 pound of hydrogen, 0.02 pound of propane, 0.09 pound of ammonia, and 0.02 pound of methane. The major products of combustion—nitrogen, $CO_2$, and water—are all common natural components of the atmosphere and water. Any explosive residue (<0.003 percent) would be relatively insignificant and either quickly dispersed by local ocean currents (Section 3.5.1.3.4) , or buried in ocean sediment.

The environmental fate and effect of military munitions constituents including RDX have been subject to a number of scientific studies to determine if these compounds represent a risk in the marine environment including water and sediment (Hawari 2000, Belden et al. 2005, Lotufo and Lydy 2005, Houston and Lotufo 2005, Rosen and Lotufo 2005, Juhasz and Naidu 2007, Rosen and Lotufo 2007a, 2007b, Boyd et al. 2008, Monteil-Rivera et al. 2008, Mukhi and Patino 2008, Weber 2008, Lotufo et al. 2009, Lotufo et al. 2010, Rosen and Lotufo 2010, Zhao et al. 2010).

As a compound in the environment, RDX is subject to natural processes in marine systems that break down (i.e., degrade) the parent molecule to inert nitrogen compounds. Processes include hydrolysis in marine water, photodegradation from light, uptake and metabolism from marine plants, and bacterial degradation in water and sediment (Hawari 2000, Juhasz and Naidu 2007, Boyd et al. 2008, Monteil-Rivera et al. 2008, Lotufo et al. 2009, Weber 2008, Zhao et al. 2010).

Based on both laboratory toxicity testing and more realistic environmental exposure scenarios, RDX has also shown low to no toxicity and no potential for bioaccumulation to a variety of marine species including amphipods, mussels, and fish (Belden et al. 2005, Lotufo and Lydy 2005, Houston and Lotufo

2005, Rosen and Lotufo 2005, Rosen and Lotufo 2007a, 2007b, Mukhi et al. 2008, Lotufo et al. 2009, Lotufo et al. 2010, Rosen and Lotufo 2010).

Therefore, based on the limited amount of explosive residue actually deposited during SSTC training events, dispersion and natural degradation of any small amount of residue, and limited toxicity to marine organisms, the overall effect on the environment from in-water explosives use would be insignificant.

#### *Other Chemicals*

Activity 50, ROWPU (Table 2-1) requires the staging on the beach of water treatment chemicals, including sodium hexametaphosphate (calgon), sodium hypochlorite (bleach), and citric acid. These chemicals are stored in five-gallon pails that remain sealed until use; the chemicals are mixed with water and added to dispensing pumps. The potential for a chemical spill is avoided by use of these small storage containers and by staging at the site only the quantities needed for the exercise.

The ROWPU unit generates a stream of concentrated brine that is collected in a storage tank and then is discharged to the sewer or percolated through the sand. Brine (concentrated salt water) may be lethal for biological organisms, but the small amounts generated would be quickly diluted into large volumes of ocean water, limiting any adverse effects to a very minimal area.

### Waste Discharges

As noted in Table 3.5-3, discharges of black water from Navy ships within three nautical miles of shore are prohibited. Most of the SSTC training activities take place within this zone, so discharges of black water associated with training at SSTC are not expected. Grey water discharges are permitted within 3 nm of shore if no pierside collection capabilities exist (OPNAVINST 5090.1). NAB Coronado has readily available pierside collection capabilities. Accordingly, discharges of black and grey water will not be further addressed in this analysis.

One possible source of water quality degradation is the discharge of solid wastes produced by training participants on vessels afloat. The Navy has instituted solid waste management guidelines and procedures for surface ships through its Environmental Compliance Afloat (OPNAVINST 5090.1). The guidelines stipulate minimum distances from shore for discharges of solid wastes. The Navy vessels supporting training activities at SSTC do not intentionally discharge any solid wastes into the water. Similarly, shore-based personnel are required to collect and dispose of solid wastes properly. The amount of solid wastes inadvertently entering marine waters from training activities is negligible.

### Resuspension of Sediments

Contaminants from many sources accumulate in bay and ocean bottom sediments over time. Ship movements and amphibious exercises may stir up bottom sediments. These activities can temporarily increase the concentration of suspended sediments and increase turbidity in the vicinity of the training exercise.

Detonating underwater explosives charges in shallow water also stirs up sediments, with a short-term increase in turbidity in the vicinity of the exercise. Several training activities would involve detonating underwater explosives charges of up to 20 pounds. Depending upon the sizes of the explosives charges and their locations in the water column, these activities could create craters in the bottom sediments up to 10 feet in diameter, for a total surface area of ($\pi r^2$ = 3.14*25 = ) 78.5 square feet (Naval Ordnance Laboratory 1973). A total of 163 such training events are held per year under the No Action Alternative (Table 3.5-7). Of these events, approximately 97 detonations will occur at or near the bottom surface, so approximately (78.5*97 =) 7,600 square feet of bottom surface would be temporarily disturbed. Shifting of bottom sands and sediments in response to currents, tides, and bottom surge would eventually fill in craters and benthic fauna would recolonize the area.

When SSTC training activities disturb bottom sediments, re-suspending them in the water, sediment contaminants may re-enter the water. Sediments offshore of Silver Strand have above-average loads of organic materials and of some toxic metals (USACE 2002; City of San Diego 2003b, 2004). Training resuspends small quantities of sediments (as identified above under Section 3.5.2.3.1, Hydrology) relative to the volume of water and these activities are intermittent; however, the re-suspension of bottom sediments during SSTC training activities is an insignificant source of contaminants. Thus, this aspect of water quality does not need to be considered further in this analysis.

#### Beneficial Uses

The RWQCB identified 13 beneficial uses for San Diego Bay and 12 beneficial uses for the Pacific Ocean (Table 3.5-6). The RWQCB identifies water quality objectives to prevent degradation of these existing or potential beneficial uses. The proposed training activities would not measurably affect monitored water quality parameters, so they would not affect the potential of these waters for their designated uses.

#### 3.5.2.3.3 Water Use

Water use is restricted surrounding some training activities for public safety and security of Navy equipment, vessels, and personnel used during the training. For instance, areas where personnel are swimming, diving, or parachuting into the water (approximately 0.5 acre) are cleared of boats for safety. Areas surrounding an underwater explosive (approximately 16 acres) are cleared prior to detonations for public safety. Areas surrounding hoses that are deployed from ship to shore during ABLTS/OPDS training (approximately 18 acres) and areas of pier construction during ELCAS training (approximately 8 acres) are cleared for public safety and equipment security (Activity 42, Table 2-1). Areas around an LCAC landing site (approximately 0.75 acre) also are cleared for public safety.

In total, training requires portions of the ocean or bay to be closed to the public for about 5,000 hours per year under the No Action Alternative. Thus, by dividing the total number of hours of closure by the total number of hours in a year, during approximately 55 percent of the year, varying sections of the ocean or bay would be closed if no training is conducted concurrently. However, training is likely to overlap in time in an unpredictable way, which results in two or more areas being closed for a shorter total percentage of the year.

The size of the water area that is closed for each training activity is relatively small when compared to total Bay and Ocean waters available for uses described in the *Basin Plan*. In addition, the durations of most training activities are short, usually less than one day. The public has multiple, alternate, equally suitable Ocean and Bay locations that it can use during training activities. In addition, the areas are not permanently closed off from use; closures are temporary and areas are reopened at the conclusion of training. Areas closed off for Navy use also change from training activity to training activity. Water use for any area of the Ocean/Bay is not permanently lost. For these multiple reasons, under the No Action Alternative, Navy training activities at SSTC are consistent with the *Basin Plan*.

### 3.5.2.4 Alternative 1 (Preferred Alternative)

#### 3.5.2.4.1 Hydrology

Under Alternative 1, land training activities would have the same types of effects on topography, and thus on surface hydrology, as described for the No Action Alternative. However, the rate (number/year) of these activities would generally increase under Alternative 1. The exercise participants would restore preexisting conditions following large-scale topographic modifications and natural processes such as wave action, wind erosion, and deposition would reduce or eliminate small-scale modifications over time. Accordingly, long-term effects of training on hydrology would be minimal.

Under Alternative 1, the level of training activity for the OPDS (Activity 38, see Table 2-1) would be the same as under the No Action Alternative. Therefore, the potential environmental effects would be as described for the No Action Alternative.

Under Alternative 1, the number of ELCAS (Activity 42, see Table 2-1) training events would increase from two to four per year. Each training activity would require 14 to 28 days to complete, so these four events would be in progress a total of 56 to 112 days per year. The effects of an individual training event would be as described under the No Action Alternative; however, ocean-bottom sediments would be displaced and local turbidity would be increased twice as often as under the No Action Alternative. These activities would occur over no more than 112 days of the year, and their effects on water resources still would be minor.

Underwater detonations could affect ocean-bottom contours by creating craters. Under Alternative 1, the number of underwater detonation training events would increase to 373 per year (Table 3.5-8). Assuming that up to 141 detonations would occur on or near the unprotected bottom surface, bottom sediments over an area of up to 11,068 square feet could be temporarily disturbed. Shifting of bottom sands and sediments by currents, tides, and bottom surge would eventually fill in craters and benthic fauna would recolonize the area.

ROWPU (Activity 50, Table 2-1) requires the staging of water treatment chemicals, a generator, and fuel tank on the beach, and the generation and possible discharge of brine, as discussed under the No Action Alternative. Under Alternative 1, the number of these exercises would increase from two to four per year. The potential for bulk chemical spills would remain insignificant, and the discharge of brine would be accomplished to avoid adverse effects on marine organisms.

#### 3.5.2.4.2 Water Quality

#### Hazardous Materials

The hazardous constituents of concern under Alternative 1 would be the same as those described under the No Action Alternative. The training tempo under Alternative 1 would be greater than under the No Action Alternative, as would the expenditures of training materials on the beaches and in the water. Effects on water quality would be about the same because the overall quantities of expended materials would still be small relative to the volumes of soil and water in which they would be expended and because the hazardous constituents in these expended items would be present in small amounts and would be released into the environment over long periods.

Under Alternative 1, SSTC training activities would require the detonation of small amounts of explosives on the water surface and underwater. Under Alternative 1, between 2,300 and 4,440 pounds of explosives would be used each year. All underwater detonation training activities occur on the oceanside of SSTC within the designated boat lanes, with the exception of small charge weight (0.033 lb) Shock Wave Action Generator (SWAG) within the open waters of San Diego Bay. In general, 78 percent of the annual SSTC underwater detonations include underwater charges of less than 10 lbs. Net Explosive Weight. Combustion of typical military explosives such as RDX and PETN releases common gases (e.g., nitrogen, $CO_2$) and relatively inert inorganic salts. Although combustion is less than 100 percent, and residues of these hazardous materials may remain in the water and sediment, these trace concentrations would not measurably affect monitored water quality parameters.

**Table 3.5-8: Surface and Underwater Detonations - Alternative 1**

| Activity | | Events/Year[1] | Explosives (pound, NEW) | |
|---|---|---|---|---|
| # | Description | | Per Event | Per Year |
| 5 | MCM | 58 (29) | 10 – 20 | 580 – 1,160 |
| 6 | Floating Mine | 53 (0) | 5 | 265 |
| 7 | Dive Platoon | 8 (8) | 8 x 3.5 | 224 |
| 9 | VSW MCM | 60 (60) | 0.1 - 20 | 6 – 1,200 |
| 10 | AUV/UUV Activities (3% of activities) | 4 (1) | 10 – 15 | 40 – 60 |
| 11 | Marine Mammal System (10% of activities) | 16 (10) | 13 – 29 | 208 - 464 |
| 12 | Mine Neutralization | 4 (4) | 8 x 3.5 | 112 |
| N1 | Shock Wave Generator | 90 (0) [2] | 0.033 | 3 |
| N2 | Surf Zone T&E | 2 (2) | Up to 20 | 40 |
| N3 | UUV Neutralization | 4 (1) | 2 x (3.3 – 3.57) | 26.4 – 28.6 |
| N7 | Airborne Mine Neutralization System (10% of activities) | 10 (3) | 3.5 | 35 |
| N9 | Underwater Demolition Requalifications | 12 (9) | 2 x (12.5 – 13.75) or 1 x 25.5 | 300 – 330 |
| N11 | Naval Special Warfare Demolition Training | 12 (4) | 5 – 10 | 60 – 120 |
| 37 | SDV/ASDS | 40 (10) | 10 | 400 |
| | TOTAL[3] | 373 (141) | – | 2,300 – 4,440[1] |

[1] Total number of events (total number of events scheduled for bottom detonations)

[2] Of the 90 total events, 74 will occur in the San Diego Bay and 16 will occur in SSTC oceanside boat lanes

[2] Totals rounded to three significant digits

## Beneficial Uses

The RWQCB identified 13 beneficial uses for San Diego Bay and 12 beneficial uses for the Pacific Ocean (Table 3.5-6). The RWQCB identifies water quality objectives to protect these existing or potential beneficial uses from degradation. Water quality objectives are achieved primarily through the establishment of waste discharge requirements (RWQCB 2007). Because the proposed training activities would not measurably affect monitored water quality parameters in the ROI, they would not affect the potential of these waters for these designated uses.

### 3.5.2.4.3 Water Use

Water use would be restricted surrounding some training activities for public safety and for the security of Navy equipment, vessels, and personnel used during the training. For instance, areas would be cleared of boats for safety reasons where personnel are swimming, diving, or parachuting into the water (approximately 0.5 acre). Areas surrounding an underwater explosive (approximately 16 acres) would be cleared prior to detonations for public safety. Areas surrounding hoses that are deployed from ship to shore during ABLTS/OPDS training (approximately 18 acres), and the area of pier construction during ELCAS training (approximately 8 acres) would be cleared for public safety and equipment security. Areas around an LCAC landing site (approximately 0.75 acre) would also be cleared for public safety.

In total, training would require closure of portions of the ocean or bay for about 7,500 hours per year under Alternative 1. This level of use would translate into closures of varying sections of the ocean or bay for about 85 percent of the year if no training were conducted concurrently. However, training would likely overlap in time in an unpredictable way, which would result in multiple areas being closed for a shorter total percentage of the year.

The size of the water area that would be closed for each training activity is relatively small when compared to total bay and ocean waters available for the uses described in the *Basin Plan*. In addition, the durations of most training activities would be short, usually less than one day. The public would have multiple, alternate, equally suitable ocean and bay locations that it could use during training activities. In addition, the areas would not be permanently closed off for use; closures would be temporary, and areas would be reopened at the conclusion of training. Areas closed off for use would also change from training activity to training activity. Permanent loss of water use is not anticipated for any area of the ocean or bay. For these multiple reasons, under Alternative 1, Navy training activities at SSTC are consistent with the *Basin Plan*.

#### 3.5.2.5 Alternative 2

The only difference between Alternatives 1 and 2 is that, under Alternative 2, all SSTC-N oceanside beach training areas would be available for Navy training, regardless of time of year. Therefore, with respect to Pacific Ocean and San Diego Bay waters, impacts associated with Alternative 2 would be the same as those described above for Alternative 1. Under Alternative 2, the proposed changes in access to and availability of existing beach and inland training areas would not result in a difference in the Proposed Action’s effects on water resources, as described under Alternative 1.

### 3.5.3 Proposed Mitigation Measures

Current mitigation measures to protect water quality would continue to be implemented.

### 3.5.4 Unavoidable Adverse Environmental Effects

No unavoidable adverse environmental effects on water quality would result from implementing any of the alternatives.

### 3.5.5 Summary of Effects

Table 3.5-9 summarizes the water quality effects of the No Action Alternative, Alternative 1, and Alternative 2.

**Table 3.5-9: Summary of Effects**

| Alternative | Effect |
|---|---|
| **No Action Alternative** | • No effects on surface water or groundwater hydrology (Silver Strand peninsula has no potable surface or groundwaters, so SSTC training activities do not affect freshwater water quality)<br>• Consistent with *Basin Plan* and NRWQC<br>• Releases of munitions constituents and other expended materials during training activities have no measurable effects on water quality<br>• No long-term degradation of marine, surface, or groundwater quality<br>• Consistent with public uses of state or federal waters |
| **Alternative 1** | • No effects on surface water or groundwater hydrology (Silver Strand peninsula has no potable surface or groundwaters, so SSTC training activities do not affect freshwater water quality)<br>• Consistent with *Basin Plan* and NRWQC<br>• Increased releases of munitions constituents and other expended materials during training activities would not measurably affect water quality<br>• No long-term degradation of marine, surface, or groundwater quality<br>• Increased use of water areas for training would be consistent with public uses of state or federal waters |
| **Alternative 2** | • Vehicle, boat, and helicopter use and amphibious landings would increase similar to Alternative 1. Effects generally are the same as described for Alternative 1. |
| **Mitigation Measures** | • The Navy's current practices affecting water quality, primarily hazardous materials handling and waste disposal practices, are based on requirements in OPNAVINST 5090.1. Those requirements, in turn, were developed primarily to comply with federal environmental regulations. Efforts to preserve vegetation on the backsides of dunes along the shoreline may reduce erosion and thus reduce transport of sediments into adjacent surface waters. Collection of spent training materials at the conclusion of training activities also may incrementally reduce the amounts of contaminants transported into adjacent waters.<br>• With respect to water use, the Navy mitigates potential effects by avoiding washing causeway pier sections in the ocean and by pumping seawater through its OPDS during training instead of using petroleum products. OPNAVINST includes guidance on shipboard operations afloat. |

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# 3.6 Acoustic Environment (Terrestrial)

# 3.6 ACOUSTIC ENVIRONMENT (TERRESTRIAL)

## 3.6.1 Affected Environment

### 3.6.1.1 Introduction

This section addresses potential impacts on the human terrestrial environment in the vicinity of Silver Strand Training Complex (SSTC) from sound generated by Navy activities identified in the alternatives, including the Proposed Action. Estimates for sound generated in the terrestrial environment should not be used to evaluate sound in water because energy propagates through air at different rates and levels than energy propagates through water. Potential impacts of sound in the marine environment are addressed in Section 3.7.2.2. Potential impacts of sound on terrestrial biological resources are addressed in Section 3.11, Terrestrial Biological Resources, and Section 3.12, Birds. Potential impacts of sound on marine biological resources are addressed in Section 3.8, Fish, Section 3.9, Marine Mammals, and Section 3.10, Sea Turtles.

#### 3.6.1.1.1 Definition

The acoustic environment consists of ambient sound levels in the air, on land, and around water areas adjacent to SSTC.

#### 3.6.1.1.2 Regional Setting

SSTC is located in an urban area, where both day and night average ambient sound levels are expected to be high. Some of the major land uses found in the area of San Diego Bay (e.g., Naval Air Station, North Island [NASNI], San Diego International Airport [SDIA], Port of San Diego) are industrial, and are major sources of ambient sound in the communities adjacent to SSTC. However, the sub-region surrounding SSTC includes large areas of open space and residential communities, which contribute very little to background sound levels. The Silver Strand is bounded by San Diego Bay on the east and the Pacific Ocean on the west, limiting the land areas and land uses exposed to local sound sources. Land uses on Silver Strand are mature—the majority of the lands have been developed, the existing land uses are long-standing and not expected to change substantially in the future, and little new construction occurs in these areas.

#### 3.6.1.1.3 Region of Influence

The region of influence for airborne sound includes all areas surrounding SSTC where sound from military training activities is or could be audible above background sound levels.

### 3.6.1.2 Sound Characteristics and Measurement

#### 3.6.1.2.1 Sound Characteristics

Sound results from vibrations, introduced into a medium such as air, that stimulate the auditory nerves of a receptor to produce the sensation of hearing. Sound is undesirable if it interferes with communication, is intense enough to damage hearing, or diminishes the quality of the environment. Human responses to sound vary with the types and characteristics of the sound source, the distance between the source and receptor, receptor sensitivity, the background sound level, and other factors such as time of day. Sound may be intermittent or continuous, steady or impulsive, and may be generated by stationary sources such as industrial plants or transient sources such as cars and aircraft.

Sound energy travels in waves. Its intensity at a receptor varies as a function of source intensity, the characteristics of the sound wave, the distance between source and receiver, and environmental conditions. Reflection, refraction, diffraction, and absorption are physical interactions between sound waves and surfaces or the medium through which the sound travels.

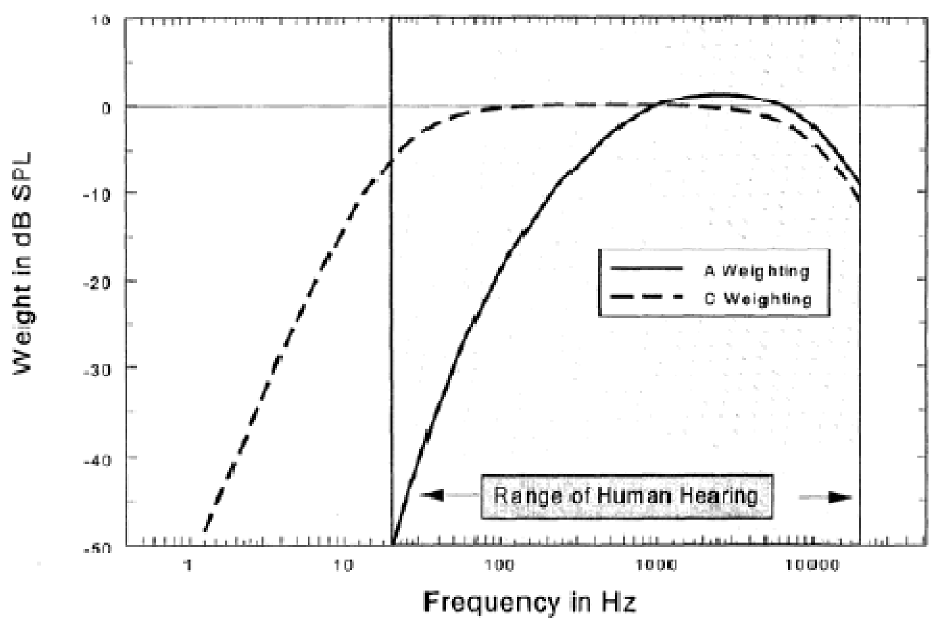
Urban environments include near-constant, long-term sound sources which create a background sound level, and intermittent, intrusive sources which create sound peaks that are noticeably higher than the background levels. The extent to which an intrusive sound affects a given receptor in the environment depends upon the degree to which the intruding sound exceeds the background sound level. Both background and intrusive sound may affect the quality of life in a given environment. Cumulative, long-term exposure to excessive background sound is recognized as the primary cause of hearing loss. Intrusive sound, although not a cause of permanent hearing loss, can contribute to stress, irritability, loss of sleep, and impaired work efficiency.

Impulsive sound is short in duration—less than one second—and high in intensity. Impulsive sound has an abrupt onset and decays rapidly; it is characteristic of small arms fire and sonic booms, and is expressed in peak, unweighted decibels (dBP). Although impulsive sound is short in duration, it may be a source of discomfort for many people: the rapid onset of sound may produce a "startle" effect (Department of the Navy [DoN] 1978).

#### 3.6.1.2.2 Sound Spectrum

Sound oscillates in waves, and the rates of oscillation (frequencies) are measured in cycles-per-second, or Hertz (Hz). The human ear can detect sounds ranging in frequency from about 20 Hz to 20,000 Hz, with the ear most sensitive to frequencies from 1,000 to 4,000 Hz (United States [U.S.] Army 2005). Most environmental sounds consist not of a single frequency, but rather a broad band of frequencies that vary in intensity. Sound frequencies from Navy training activities vary greatly. Some examples of frequencies at peak sound energy include fixed-wing aircraft (2,000 – 4,000 Hz), small arms (approximately 500 Hz), explosives (approximately 31 Hz), street vehicles (approximately 60 Hz), and diesel trucks (approximately 250 Hz) (DoN 1978; U.S. Army 2005).

The human ear is not equally sensitive to all sound frequencies within the frequency range of human hearing; the human ear cannot detect lower frequencies as well as it can detect higher frequencies. Thus, the "raw" sound intensity measured by mechanical devices is selectively weighted—or filtered—to simulate the non-linear response of the human ear. The two accepted weighting networks are the C scale and the A scale (Figure 3.6-1).




Source: U.S. Army 2005

**Figure 3.6-1: A and C Weighting Scales**

Weighting networks are used in sound meters to adjust their frequency response to “raw” (unweighted) measured sounds. The A-weighting network is designed to duplicate the sensitivity of the human ear, and heavily discounts sound energy at low frequencies and at very high frequencies. In several studies, a person’s judgment of the loudness of a sound has been shown to correlate well with the A-weighted values of those sounds (DoN 1978). For this reason, the A scale is the most common weighting scheme for community sound measurements and standards, and is used for most environmental noise evaluations. These adjusted sound levels are termed "A-weighted" sound levels, denoted as dB(A) or simply dBA. The A-weighted scale is used internationally in sound standards and regulations. Therefore, dBA is the primary sound metric to be used in analyzing sound effects under Environmental Consequences because its characteristics are reflective of the human ear’s frequency response.

The C-weighting network weights sound energy levels equally across the frequency range of human hearing, while discounting some of the very high and very low frequencies at each end of the range. Accordingly, the C scale closely resembles the actual sound pressure level received by sound level meters, and is often used to calibrate sound meters. C-weighted measurements are more useful than A-weighting for biological organisms other than humans, because biological organisms have different ranges of hearing than humans. C-weighted sound levels also are often used for the analysis of low-frequency sounds such as artillery and detonations. Sound measurements thus adjusted are termed "C-weighted" sound levels, denoted as dB(C) or simply dBC. Because dBC is not weighted to account for human hearing frequencies, this metric is not used for analysis in this document because this section analyzes acoustic effects of training exercises on humans.

Impulsive sound is measured and expressed in dBP. Peak impulsive sound weighting is used for single-event sound, or impulsive sound events that last less than one second in duration, such as gun noise. Peak sound (dBP) does not correlate directly with time-averaged ambient sound standards. The peak sound values presented in this analysis are PK-15, or the calculated peak sound level expected to be exceeded 15 percent of the time. PK-15 accounts for statistical variation in the peak sound level due to weather conditions (U.S. Army 2005). The PK-15 sound value is conservative (e.g., PK-50, or the sound level exceeded 50 percent of the time, is the median sound level and is lower for a given sound than PK-15), and is considered to represent meteorological conditions that favor atmospheric transmission of sound.

#### 3.6.1.2.3 Sound Duration and Timing

Transient sound is defined as an “event having a beginning and an end where the sound temporarily rises above the background and then fades into it” (U.S. Army 2005). These types of sounds, measured in terms of Sound Exposure Level (SEL), are associated with vehicles driving by or aircraft overflights. The SEL is based on two characteristics of transient sound, duration and intensity, where a long duration, low intensity event can be as annoying as a high intensity, shorter event. The SEL is the total acoustic energy in an event normalized to one second (U.S. Army 2005). This number represents all of the acoustic energy for the event in a one-second period.

A continually varying sound level over a given period can be described as a single "equivalent" sound level ($L_{eq}$) that contains an amount of sound energy equal to that of the actual sound level. Thus, the $L_{eq}$ is a measure of the average acoustic energy over a stated period. Equivalent sound levels can represent any length of time, but typically are associated with some meaningful period, such as an eight-hour $L_{eq}$ for an office, or a one-hour $L_{eq}$ for a classroom lecture (U.S. Army 2005). The $L_{eq}$ is averaged over a 1-, 8-, or 24-hour period. The $L_{eq}$ is averaged over a 1-, 8-, or 24-hour period. The $L_{eq}$ is used to describe continuous sound sources, and may be obtained by averaging sound levels over a selected period. This level is the estimation of the continuous sound level that would be equivalent to the fluctuating sound signal under consideration (DoN 1978).

The Community Noise Equivalent Level (CNEL) and Day-Night Average Noise Level (DNL or $L_{dn}$) are 24-hour average measures of ambient sound that are weighted to account for differences in community sensitivity to sound at night. The CNEL metric adds a 5-dBA penalty, or weight, to the evening (7 p.m. - 10 p.m.) $L_{eq}$, and a 10-dBA weight to the nighttime (10 p.m. - 7 a.m.) $L_{eq}$. The DNL ($L_{dn}$) metric adds a 10-dBA penalty, or weight, to the nighttime (10 p.m. - 7 a.m.) $L_{eq}$. In accordance with Naval Facilities (NAVFAC) sound guidance document, P-970 *Planning in the Noise Environment*, CNEL is the preferred metric for assessing sound in California, and is used in this analysis. A list of commonly encountered sound sources and their intensities is provided in Table 3.6-1.

**Table 3.6-1: Sound Levels of Selected Sound Sources and Environments**

| **Source** | **Sound Level** (dBA) | **Human Perception of Loudness** (relative to 70 dBA) |
|---|---|---|
| Military Jet Takeoff w/afterburner at 50 feet<br>Civil Defense Siren | 130 | **Above Threshold of Pain** |
| Commercial Jet Takeoff at 200 feet | 120 | **Threshold of Pain**<br>32 times as loud |
| Pile Driver at 50 feet | 110 | 16 times as loud |
| Ambulance Siren at 100 feet<br>Power Lawn Mower at 3 feet | 100 | **Very Loud**<br>8 times as loud |
| Motorcycle at 25 feet<br>Propeller Plane at 1,000 feet | 90 | 4 times as loud |
| Garbage Disposal at 3 feet<br>Passenger car, 65 mph at 25 feet | 80 | 2 times as loud |
| Vacuum Cleaner at 3 feet<br>Living Room Stereo at 15 feet | 70 | **Moderately Loud**<br>(Reference Loudness) |
| Normal Conversation at 5 feet | 60 | 1/2 as loud |
| Light Traffic at 100 feet | 50 | 1/4 as loud |
| Distant Bird Calls | 40 | **Quiet**<br>1/8 as loud |
| Soft Whisper at 5 feet | 30 | 1/16 as loud |
| | 0 | **Threshold of Hearing** |

Notes: dBA—decibels, A-weighted

Source: ISE 1997

### 3.6.1.2.4 Sound Intensity and Perception

Sound intensity is expressed in decibels (dB), a logarithmic scale that compares the power of an acoustical signal to a reference power level. A sound level of zero decibels is defined as the threshold of human hearing. The quietest environmental conditions yield sound levels of about 20 dBA. Typical night-time sound levels in quiet residential areas have a sound level of about 35 to 45 dBA. Normal speech has a sound level of about 60 dBA at a distance of about one meter. A freight train passing by at about 15 meters yields a sound level of about 85 dBA. The human pain threshold is about 120 dBA (Table 3.6-1).

A 1-dB change in the sound level is not perceptible to humans (imperceptible change). A 3-dB change is barely perceptible and a 5-dB change is clearly noticeable. A change in sound level of 10 dB represents more than a three-fold change in sound intensity. However, a 10-dB change is perceived by the human ear as a doubling or halving in loudness.

#### 3.6.1.2.5 Sound Propagation and Attenuation

Sound energy radiates outward from its source. This sound energy attenuates (decreases in intensity) as it moves away from its source because of geometric spreading of the sound energy, atmospheric absorption, ground attenuation, and shielding. Sound metrics for discrete sources are expressed in terms of a distance from the source (a typical reference distance is 50 feet, or 15 meters).

Sound waves from point sources radiate in a spherical pattern, with the wave intensity attenuating due to geometric spreading by 6 dB per doubling of distance from the source (U.S. Army Center for Health Promotion and Preventive Medicine [CHPPM] 2005). Line sources such as roads generate composite sound waves from numerous moving point sources that radiate outward in parallel planes; these waves attenuate due to geometric spreading by only 3 dB per doubling of distance.

At substantial distances from the source, air absorption and ground attenuation can affect sound propagation. The efficiency of atmospheric absorption varies over the range of sound frequencies. At frequencies around 2,000 Hz, air absorption is about 20 dB per kilometer (km). At 1,000 Hz, it is about 7 dB per km. At frequencies below 125 Hz, it is less than 1 dB per km. Factors for ground attenuation and barrier attenuation likewise vary by frequency. In practice, empirical determinations of sound attenuation (i.e., measuring the actual source in its proposed location) are best able to account for all possible factors.

### 3.6.1.3 Department of Defense Ambient Sound Guidance Documents

Chief of Naval Operations Instruction 5090.1 contains guidance for considering time-averaged community sound levels in environmental evaluations (DoN 2007). Chapter 17, *Noise Prevention Ashore*, contains guidance for sound control and abatement of Navy shore activities. *Planning in the Noise Environment* (DoN 1978), provides compatibility criteria for various land uses. Separate evaluation criteria apply to impulsive sound events. CHPPM has also developed Department of Defense (DOD) guidance for military operational noise, including *Operational Noise Manual: An Orientation for Department of Defense Facilities* (CHPPM 2005).

#### 3.6.1.3.1 Time-Averaged Sound Levels

Ambient sound standards regulate ambient sound levels through time-averaged sound level ($L_{eq}$) limits. Sound standards for land use compatibility established by DoD and civilian jurisdictions are expressed in terms of the DNL or CNEL. Based on numerous sociological surveys and recommendations of federal interagency councils, the most common benchmark for assessing environmental sound impacts is a CNEL of 65 dBA. Sound levels up to 65 dBA, CNEL are considered to be compatible with land uses such as residences, transient lodging, and medical facilities. Appropriate sound mitigation is recommended for new development in areas where the CNEL exceeds 65 dBA. A sound level of 75 dBA, CNEL is a threshold above which individuals in the community may experience annoyance and minor health effects.

CHPPM has defined the following three land use planning zones to account for annoyance from installation training sound (CHPPM 2005):

- **Noise Zone I** includes all areas in which the A-weighted DNL (ADNL) is less than 65 dBA; Noise Zone I is the zone farthest from the sound source, and includes all areas not within the other two Noise Zones. This area is suitable for all types of land uses.

- **Noise Zone II** includes all areas in which the ADNL is between 65 and 75 dBA. Sound exposure in this zone is substantial, and allowable land uses include manufacturing, warehousing, transportation, and resource protection. Residential development in this zone is not normally recommended.

- **Noise Zone III** includes all areas in which the ADNL is above 75 dBA. Sound-sensitive land uses, such as housing, schools, churches and medical facilities, are not recommended for this zone.

#### 3.6.1.3.2 Impulse Sound

Community annoyance from impulsive sound is assessed by DoD using C-weighted DNL (CDNL), but also may be assessed using ADNL. The relationship between CDNL and annoyance has been estimated, based on community reaction to impulsive sounds over several years (Table 3.6-2). Whereas occupational sound levels are assessed in terms of hearing loss, environmental sound levels are assessed in terms of their potential to interfere with personal, workplace, and community activities, and in terms of their potential to annoy occupants of nearby land uses.

**Table 3.6-2: Relationship Between Annoyance and CDNL**

| CDNL | Individuals Highly Annoyed (%) |
|---|---|
| 48 | 2 |
| 52 | 4 |
| 57 | 8 |
| 61 | 14 |
| 65 | 23 |
| 69 | 35 |
| Note: Analyses in this section primarily use dBA, and therefore, DoD community annoyance standards will be in terms of the ADNL equivalent of CDNL values. | |

Source: U.S. Air Force 2008

NAVFAC P-970 indicates that impulse sounds should be considered separately when the peak sound level exceeds 110 dB. The effects of impulse sounds should be determined based on CNEL (DoN 1978). Table 3.6-3 presents DoD guidelines for evaluating the effects on the community of impulsive gun sound.

The DoD developed metrics to evaluate the effects of peak impulse sound from military sources on sensitive receptors. These metrics are presented in Table 3.6-3 and are expressed in unweighted peak impulse levels (dBP) rather than C-weighted sound levels (dBC). Impulsive sound limits—as presented in Table 3.6-3—correspond to areas of low to high risk of sound complaints (CHPPM 2007). These impulsive sound levels are used to assess the extent of impulsive effects on the region.

**Table 3.6-3: Naval Surface Warfare Center Gun Sound Complaint Prediction Guidelines**

| Predicted Sound Level (dBP) | Risk of Complaints | Action |
|---|---|---|
| < 115 | LOW | Fire all programs |
| 115 - 130 | MODERATE | Fire important tests. Postpone non-critical testing if possible |
| >130 | HIGH | Only extremely important tests should be fired. |

Note: For rapid-fire test programs or programs that involve many repetitions of impulse sound, reduce allowed sound levels by 15 dBP
Source: U.S. Army, 2005, Operational Noise Manual (Table A-4)

Technical literature (e.g., Schomer 2005) suggests that “regular” impulse sounds be given a 5-dBP penalty to properly account for their characteristics; and penalties of 12 to 15 dBP are suggested for highly energetic impulsive sound. As Table 3.6-3 indicates, the Naval Surface Warfare Center (NSWC) recommends a 15-dBP weighting for rapid-fire impulse sound. Such an adjustment moves a sound source up one risk category.

A separate criterion is used to determine the need for hearing protection from blast sound. Hearing protection is required for exposure to any sound level greater than 140 dBP. Distance to the 140 dBP contour in meters = 300 times the cube root of the weight of explosive in kilograms ($D = 300 \times W^{1/3}$) (U.S. Army, 2003).

### 3.6.1.4 Sensitive Receptors

Sound-sensitive receptors are human activities or land uses that may be subject to substantial interference from sound. Land uses associated with sensitive receptors include residential dwellings, mobile homes, hotels, motels, hospitals, nursing homes, education facilities, recreational facilities and areas, and libraries.

Sensitive receptors surrounding SSTC are identified by geographic location below, and are shown in Figure 3.6-2. Recreational and commercial users of adjacent ocean and San Diego Bay waters are considered to be sensitive receptors; however, these receptors are assumed to be dispersed over large areas (i.e., low density) and are assumed to be mobile—their locations will gradually change relative to land-based sound sources.

#### 3.6.1.4.1 SSTC - North

Sensitive receptors adjacent to SSTC-North (N) include the Coronado Shores residential and commercial area; Rendova Housing (military); Coronado Cays residential area; Military Family Housing located across from Beach Lanes 7-10; and Silver Strand State Beach (SSSB):

- Coronado Shores is a beach-front community of 15 high-rise condominium complexes, adjacent to Hotel Del Coronado, on the Pacific Ocean.
- Rendova Housing is located within Naval Amphibious Base (NAB) Coronado, and is for both unaccompanied personnel and families.
- Military Family Housing at the southern end of SSTC-N is adjacent to the Alpha, Bravo, and Charlie beaches and across State Route (SR)-75 from Boat Lanes 7 through 10. This housing area consists of single-family and duplex housing units, some of which front San Diego Bay. Silver Strand Elementary School is located within this military housing area.
- Coronado Cays is a small housing community of upscale homes on the bay side of Silver Strand, where most homes feature boat slips.
- SSSB is a public beach with activities such as camping, swimming, surfing, boating, and picnicking. SSSB has pedestrian traffic on all beaches, as well as in pedestrian tunnels between the ocean and bay sides.


**Figure 3.6-2: Sensitive Sound Receptors**

#### 3.6.1.4.2 SSTC-South

Sensitive receptors near SSTC-South (SSTC-S) include Coronado Cays, SSSB, South Bay Biological Study Area (SBBSA), YMCA Camp Surf, and residences in Imperial Beach. Coronado Cays and SSSB have already been described in the previous section. Loews Coronado Bay Resort Hotel and Coronado Cays residential development are located north of SSTC-S along the western side of SR-75, opposite SSSB. Land use on the southern side of SSTC-S in Imperial Beach is predominantly residential:

- SBBSA is a 27-acre site in the northeastern corner of SSTC-S.
- YMCA Camp Surf lies in the extreme southwestern corner of SSTC-S; this facility is an overnight recreational camp for children.
- Sensitive receptors in Imperial Beach include three elementary schools: West View, Bayside, and Imperial Beach; the area also includes Mar Vista High School. Residential areas of Imperial Beach are located more than 2,000 feet south of Boat Lane 14, adjacent to the southern boundary of SSTC-S.

### 3.6.1.5 Existing Sound Sources and Levels

The principal sources of ambient sound at SSTC are motor vehicle traffic along SR-75 and other major local roadways, aircraft activities at NASNI and Naval Outlying Landing Field Imperial Beach (NOLF-IB), and SSTC activities. Commercial aircraft activities at SDIA and large vessels on San Diego Bay and offshore of the Silver Strand also contribute to background sound levels at SSTC.

#### 3.6.1.5.1 Traffic Sound

SR-75 is a major source of sound along Silver Strand between the southern limits of Coronado and the northern limit of Imperial Beach, especially during late evening and early morning hours. Low levels of traffic sound from SR-75 are audible in SSTC training areas. Factors affecting the traffic sound level include the volume of vehicles, their average speed, and the mix of vehicles (primarily the number of trucks). In 2008, the annual average daily (24-hour) traffic volume on SR-75 was 23,700 at SSTC-N and 17,800 at SSTC-S (California Department of Transportation [Caltrans] 2009).

Average sound levels at adjacent receptors from traffic on SR-75 were estimated using the Sound32 noise prediction model, the California Department of Transportation’s (Caltrans’) public domain version of the Federal Highway Administration (FHWA) STAMINA 2 highway traffic noise prediction model and traffic data available from Caltrans (Caltrans 2008, 2009). The average daytime sound level at 100 feet from the centerline of the roadway is estimated to be 69 dBA. The corresponding sound level at 155 feet from the centerline is estimated at 67 dBA. Traffic sound levels at Coronado Cays residences are lower because there is a six-foot-high sound wall between the residences and SR-75. Traffic sound levels in the Coronado Cays park and residential area on April 7, 2002 ranged from 52 to 58 dBA, as shown in Table 3.6-4.

According to Caltrans, average daily traffic volumes on SR-75 are projected to increase by about 30 percent (between Coronado Cays and NAB Coronado) to 40 percent (between Coronado Cays and 9th Street in Imperial Beach) by about 2023 (Caltrans 2003). Increases in peak-hour traffic volumes are estimated to be somewhat less, at about 20 to 25 percent. These projected increases will result from new development and from current trends in per-capita automobile trips not associated with military training. A doubling of traffic volume, assuming that average vehicle speeds remained about the same rather than decreasing with increased congestion, would increase traffic sound along SR-75 by about 3 dBA. Sound levels would only increase by 3 dBA because a doubling of intensity in a line sound source only results in a 3-dBA increase (U.S. Army 2005). Thus, the projected increases in traffic volumes on SR-75 would not result in a noticeable increase in community sound levels.

On Silver Strand, between Palm Avenue and the entrance to SSTC-S, evening peak-hour volumes of military vehicles are estimated at about 41 vehicles per hour. Depending upon the mixture of vehicles (cars, light trucks, and heavy trucks) and vehicle speed, the hourly equivalent noise level attributable to this volume of traffic would range from about 50 to 55 dBA, $L_{eq}$. Although pass-by noise from individual cars would be audible at residences along Silver Strand, the background community noise level during the evening peak commute period is probably higher than 55 dBA, $L_{eq}$.

#### 3.6.1.5.2 Aircraft Sound

Aircraft activities at NASNI and SDIA are constant. SSTC training beaches are located outside of the 65-dBA sound contours for NASNI and SDIA (City of San Diego 2007). The NASNI 65-dBA sound contour lies northwest of the Coronado Shores residences. SSTC-S is located outside of the 65-dBA sound contour for NOLF-IB (DoN 1989). Although SSTC training beaches are outside of 65-dBA sound contours for these facilities, aircraft activities at these facilities still would contribute slightly to the background sound level.

##### Aircraft Flight Patterns

San Diego's airspace is comprised of layered, dynamic, and detailed air traffic control procedures designed to coordinate the volume, density, and capabilities among several airfields and various aircraft types and sizes. As one of the agencies responsible for managing its assigned airspace, Naval Base Coronado (NBC) has established course rules for its two airfields (NASNI and NOLF-IB) within San Diego's airspace. These course rules promote safe flight operations and training, and sequence the military, civilian, and commercial aircraft entering, exiting, and transiting through its airspace. These course rules also establish conditions to minimize or abate aircraft noise in adjacent communities.

Within this airspace, military helicopters are in frequent use for training pilots, supporting military training outside of the metropolitan San Diego area, and supporting SSTC training. Several well-established flight patterns for military helicopters are used to maintain safe flight operations in the complex airspace. Pilots are instructed to remain above prescribed minimum altitudes in accordance with Federal Aviation Regulation 14 CFR Part 91, Section 91.119.

Aircraft approaches and departures out of NASNI for helicopter training outside of the San Diego metropolitan area use two primary patterns. The "Point Loma" pattern is followed for approaches and departures to the west; this pattern loops south of Point Loma and follows San Diego Bay to designated landing pads on NASNI, with a flight ceiling of 475 feet above ground level (agl). Training conducted east of San Diego follows the "State Route 54" pattern from landing pads on NASNI east and south along San Diego Bay and turns east along State Route 54 in southern San Diego County. The flight ceiling along the State Route 54 pattern is 575 feet agl. Based on 2005 information, approximately 40 flights per day occur along each of these flight patterns. None of these flights support SSTC training.

As the primary Navy helicopter training installation on the west coast, NBC helicopter pilot training includes a curriculum of repetitive practice of various flight skills. While limited helicopter pilot training is conducted at NASNI, NASNI is the home base for these helicopter squadrons, and provides landing pads, maintenance facilities, and crew facilities. Most of the flight skills are developed and practiced at NOLF-IB. Transit flight patterns between NASNI and NOLF-IB use three primary patterns. Two of these flight patterns lie to the west of SSTC beaches. Flights from NASNI to NOLF-IB typically originate from landing pads on the north side of NASNI, follow San Diego Bay to the west and south, and then proceed from the mouth of San Diego Bay to NOLF-IB over the Pacific Ocean, approximately three miles west of the beaches. Flights from NOLF-IB to NASNI typically follow a parallel route south to north, but located approximately two miles west of the beaches. A third flight pattern from NASNI to NOLF-IB follows a course east and south along San Diego Bay from landing pads on NASNI, and crosses the Silver Strand at Emory Cove through the northern end of SSTC-S. Flight ceilings on these routes range from 475 to 575 feet agl. Based on 2005 information, approximately 54 flights per day occur on the ocean flight patterns between NASNI and NOLF-IB, and approximately 10 flights per day occur on the bay flight pattern.

None of these helicopter pilot training flights support the SSTC training presented in this EIS. The flights and tracks described above are not part of the Proposed Action addressed in Section 3.6.2. The SSTC training patterns are not the same as those described in this sub-section, and represent less than five percent of the total number of annual flights of helicopters based at NASNI.

#### Helicopter Flight Rules and Noise

NASNI and NOLF-IB, have a suite of policies, procedures, and programs, along with specific course rules, to further address and promote measures to minimize aircraft noise. Chapter 9, paragraph C (Noise Abatement) of NBC Instruction 3710.7U (Air Operations), dated September 10, 2008 states that: (a) pilots shall ensure altitude minima as prescribed in the OPNAVINST 3710.7 series and course rules, (b) flights directly over the city should be avoided, and (c) H-53 model aircraft are prohibited from using NOLF-IB.

NOLF-IB is open for flight operations from the last Sunday in October to the first Sunday in April on Monday-Thursday from 0800 to 2230 and on Friday from 0800 to 1800 Pacific Standard Time. NOLF-IB is open from the first Sunday in April to the last Sunday in October on Monday – Thursday from 0800 to 2300 and on Friday from 0800 to 1800 Pacific Daylight Time. The airfield is closed from 1800 local time the day prior to and during all government holidays.

### 3.6.1.5.3 Sound from Military Activities at SSTC

Principal sound sources associated with SSTC training activities are land and water vehicle engines, hovercraft fans, tracked vehicles, small arms fire, blasting caps, underwater explosives, Elevated Causeway System (ELCAS) training which includes pile driving, call-outs from large groups, helicopters, and fixed-wing aircraft. Some amphibious training activities, specifically hovercraft activities and pile driving, create sound levels that could affect adjacent land uses. One of the locations where ELCAS training is conducted is on Bravo Beach, adjacent to military housing and near Fiddler’s Cove Marina. An existing demolition pit, located on Blue 1 beach, uses blasting caps and pyrotechnic ordnance, primarily during Hell Week (Activity 72, Table 2-1).

Hovercraft, or Landing Craft, Air Cushion, (LCACs) produce the highest continuous sound levels of all amphibious training activities (Table 3.6-4). An LCAC can generate a level of 84 dBA at a distance of 345 feet from the hovercraft when its engines are running at 80 percent power. When the engines are operated at 45 percent power, the area within which sound levels are equal to or greater than 84 dBA shrinks to 120 feet.

Sound caused by Navy activities was measured at eight locations on April 7, 2002, between 7 a.m. and 12 noon. Sound levels were measured on this day because an amphibious exercise was scheduled for the SSTC beaches. Measurement locations are described in Table 3.6-4. A sound meter was placed approximately five feet above the ground at each measurement location. In addition to measuring sound levels on April 7, 2002, the acoustic engineer conducting the study queried residents near the measurement sites about their perceptions of sound from military training at SSTC. The responses are provided in Table 3.6-4.

Sound levels at sensitive receptors from SSTC activities vary with the number of sources operating, the operating mode, the distance from source to receptor, the topography between the source and receptor, and meteorology. Two of the louder SSTC sound sources are (LCAC) hovercraft and helicopters. The April 7, 2002 activities observed from measurement location CC-4 (Figure 3.6-2) included LCACs and a helicopter. As shown in Table 3.6-4, short-term sound levels at CC-4 during LCAC and helicopter activities ranged from 70 to 86 dBA. The sound levels were measured with an unobstructed line of sight to most of the sources, and from distances—approximately 400 to 800 feet —that are similar to those of the sensitive receptors closest to the operating areas.

### 3.6.1.6 Current Mitigation Measures

Sound from Navy training activities at SSTC is managed primarily via administrative controls (planning). Activity planning often considers location (e.g., Breacher training is located in inland areas) and time of day. Call-outs during physical conditioning training are minimized at night and when in residential areas. The Navy also notifies local emergency personnel prior to training exercises that include the use of pyrotechnics or blanks.

**Table 3.6-4: Acoustic Measurements During Historical Fleet Exercise (April 2002)**

| Location | Start time (duration in minutes) | Average Sound Level dBA $L_{eq}$ | Event Sound Levels dBA | Comments |
|---|---|---|---|---|
| IB-1. Imperial Beach, opposite 106 Carnation Avenue, at former entrance to YMCA Camp Surf | 0744 (59) | 48 | No events of note. | Ambient sound is surf and a faint low engine noise (could be offshore vessels) at 47-48 dBA. Without engine sound surf approx. 43 dBA. FleetEx activities barely and occasionally visible in the distance (rough estimate 1,000 to 2,000 feet to the north). Passing resident reports two hovercraft offshore.[1] Other sources of sound are light and commercial aircraft overflights, occasional vehicles on Carnation Ave, and birds chirping. No discernable acoustic change even when it appears that there is increased FleetEx activity. |
| | 0849 (62) | 52 | No events of note. Military truck on Carnation Ave. at 72 dBA | Similar to first hour. Higher overall sound level due to increased vehicle activity on Carnation Ave., increased single-engine aircraft overflights, a few passes by a powered paraglider, wind gusts, loud voices, and barking dogs. Passing residents report "a ton of activity on the beach."[2,3] |
| CC-1. Coronado Cays. Approximately 200 feet south of entrance, inside sound wall between SR-75 and residences. | 0707 (14) | 57 | No events of note | Principal background sound source is highway traffic for all CC measurements. At CC-1, sound also from traffic on internal road. Sound levels 49 dBA with no traffic; 58 dBA with SR-75 traffic; 62 dBA with internal traffic. |
| CC-2. Coronado Cays. Approximately 900 feet south of entrance, in park opposite and south of fire station. Approximately 350 feet east of sound wall at SR-75 and 100 feet west of residences. | 0730 (82) | 54 | 0835 FleetEx "boats" audible and seen immediately off shore. Sound levels approx 60 dBA | Sound levels 47 dBA with no traffic; 53 dBA with SR-75 traffic. Other sources include fire truck start. |
| CC-3. Coronado Cays. West of CC-2 in park opposite and south of fire station. Approximately 150 feet east of sound wall at SR-75. | 0857 (25) | 57 | No events of note | Sound levels 49 dBA with no traffic; 52 dBA with SR-75 traffic; 54 dBA with internal traffic. Other sound sources include dogs barking, aircraft overflight, and motorized hang glider. |
| | 0937 (7) | 56 | 0936 Military vessel pass at about 60 dBA average, peak at 64 dBA | |

**Table 3.6-4: Acoustic Measurements During Fleet Exercise (April 2002) (Continued)**

| Location | Start time, (duration in minutes) | Average Sound Level dBA $L_{eq}$ | Event Sound Levels dBA | Comments |
|---|---|---|---|---|
| CC-4. Coronado Cays. Approximately 4,200 feet south of entrance, at break in the sound wall between Coronado Parks building and residences. View to beach on western side of SR-75. | 1038 (59) | 68 | 1037 White helicopter (maybe non-military) pass at 71 dBA, as a 2nd LCAC comes ashore approximately 500 feet south of LCAC-24. Helicopter hovers at 75 dBA.<br>1046 LCAC-24 starts main engine, lifts up at 85-86 dBA, departs beach quickly.<br>1132 LCAC (#3) ashore approximately 300 feet south of opposite CC4, sound in low 70s dBA.<br>1136 LCAC #2 start, lift and depart, sound in mid 70s dBA. | LCAC-24 parked on beach approximately 200 feet south of point opposite measurement location CC4. Engine apparently idling for internal power source; radar antenna rotating; propellers stopped. Sound level approximately 59 dBA with no traffic on SR-75 (a rare occurrence).<br>LCAC #3 at idle with troops unloading, barely audible.<br>Resident who lives in a Coronado Cays unit that faces the San Diego Bay (east), with no windows to the west, reported that he was awakened at 6:30 a.m. by beach activity. |
| | 1144 (43) | 65 | 1215 Inbound LCAC # 4 ashore then south to where LCAC #2 parked; approximately 25 seconds > 70 dBA.<br>1224 LCAC #3 depart; approximately 70 seconds > 74 dBA with peak at 79 dBA. | |

[1] Resident of 106 Carnation says only sound heard from Navy activities is occasional aircraft.
[2] Residents living near intersection of Carnation and Silver Strand said they rarely hear much from NRRF. Did hear "pounding" one night recently.
[3] Resident mentioned previously hearing "booms," and assuming it might be shelling at San Clemente Island. A caretaker at Camp Surf commented on sound occurring 3 to 4 nights before 07 April and said it sounded like a generator.

### 3.6.2 Environmental Consequences

This resource section focuses only on groups of activities that could generate sufficient sound to cause complaints from nearby occupants. As discussed previously, similar types of activities are grouped together (aggregated) for ease of analysis. Types of activities that could have such effects are those near sensitive sound receptors that involve: low-level aircraft (e.g., helicopter transits or hovering) or LCAC; pile driving; use of blasting caps, blanks, or small arms; operation of heavy equipment or machinery; or large groups of participants. Training activities without such elements include Activities 1-3, 5, 9, 10, 11, 13-24, 26, 29, 33, 34, 36, 37, 44-47, 52-58, 60-62, 65, 67, 70, 72-74, 77, 78, N2-N4, N10, and N13 (Tables 2-1 and 2-2).

#### 3.6.2.1 Approach to Analysis

Public concerns about sound in general may include hearing loss, non-auditory health effects, conversation interruption, sleep interference, distraction, and annoyance. Training activities at SSTC do not generate sound at intensities that could contribute to hearing loss in off-site public areas, so this issue is not further addressed. Thus, at these intensities, the potential effects would be conversation interruption, sleep interference, distraction, and annoyance.

The potential sound effects of the Proposed Action were determined through empirical measurements, use of established sound equations, and use of predictive models where actual measurements were not available. Empirical measures of various existing sources at SSTC were presented previously in Section 3.6.1.5.

Shotgun blasts at the Breacher training facilities on SSTC-S were evaluated with the BNOISE2 model. This model was developed by the U.S. Army to calculate blast sound exposure contours from large guns and explosives charges. BNOISE2 takes into consideration the source (gun or explosives), the number and timing of sound events, range attributes, weather, and—for guns—directivity of the muzzle. The sound source intensities are based on empirical data collected on military ranges. Estimated peak single-event sound intensities (dBP, unweighted decibels) were expressed in units of PK-15.

#### 3.6.2.2 No Action Alternative

##### 3.6.2.2.1 Aircraft

Helicopters support SSTC training Activities 4, 6, 7, 12, 16, 25, 26, 28, 29, 30, 35, 37, and 64. Under the No Action Alternative, up to 740 helicopters may participate in SSTC training events (Appendix C), or about 15 sorties per week, for approximately 1,113 hours per year. Approximately 100-150 helicopters fly into SSTC-S inland under baseline training. The remaining 590-640 helicopter operations occur offshore in the boat lanes or bay training areas. No helicopters hover over beaches.

The typical pattern flown by helicopters in support of SSTC-S inland training is based on a prevailing west wind, blowing from the Pacific Ocean across SSTC-S, and toward San Diego Bay. Helicopters would approach along the San Diego Bay flight pattern, transiting at altitudes of 475 to 575 feet agl. In southern San Diego Bay, the helicopters would turn west on the southern side on Emory Cove and begin a descent into SSTC-S, targeting the drop zone to the west of Bunker 99 on the northern end of SSTC-S. Once established in this approach, the helicopters would typically descend to 150 feet agl unless supporting NSW SPIE training, in which case they would be maintain 300 feet agl. Depending on the length of the fast rope, the helicopters would hover at 50-100 feet agl over the drop zone with no hovering over the beach. On departure, the helicopters would ascend to the west over the Pacific Ocean. If helicopter flights are required to hold position over southern San Diego Bay, the helicopters will maintain a separation of at least 500 yards from any civilians. These activities are typically supported by single Navy SH-60 helicopters. If the prevailing winds shift from the west to the east, the helicopter will approach the SSTC-S drop zone from the Pacific Ocean and will depart toward San Diego Bay. Flights into SSTC-S may occur throughout the day and, less frequently, during the night.

Helicopters are required to approach and depart from training beaches over the water, so an estimated 80 percent of their flight in support of beach training events occurs over the water. For some of the mine countermeasures training, helicopters may log up to four hours of flight time, mostly over water. For other training activities, the duration of helicopter activities is much shorter. The infrequent, short-duration pass-bys over public areas constitute discrete, intrusive sound events that, while noticeable because they substantially exceed the ambient background sound level, contribute very little to the hourly average sound level.

Most of the aircraft support for training activities at SSTC is provided by the SH-60 and CH-53E helicopters. The SH-60 helicopter (typical aircraft for training activities at SSTC) can produce single-event pass-by sound levels approaching 91 dBA at 200 feet from the source (U.S. Army 2006; DoN 2009). At distances beyond about 3,990 feet (pass-by) and 890 feet (hovering), sound from these sources would be at or below typical background sound levels (<65 dBA) for a typical daytime urban area. These sound levels are assumed to be reasonably representative of the average sound emissions from the types of helicopters used in training at SSTC.

Amphibious Raid training represents the most intense use of helicopter support for training at SSTC, with up to 15 helicopters per exercise. Amphibious Raid primarily occurs on White 2 and Purple 1 (Boat and Beach Lanes 12 and 13), with up to four helicopters operating simultaneously on the Beach Lanes. The closest sensitive receptor would be the SBBSA (approximately 2,860 feet [870 meters] away). Based on the sound emission factor for the SH-60 helicopter, a single airborne helicopter pass-by at 500 feet above ground level on the closest portions of SSTC-S would produce a one-minute $L_{eq}$ of about 37 dBA at SBBSA (Table 3.6-5). Four helicopters operating in that general area may generate a combined sound level of up to 42 dBA, one-minute $L_{eq}$, at SBBSA. Amphibious Raid Activities are expected to occur only twice per year, for a period of three days, under the No Action Alternative.

**Table 3.6-5: Single Helicopter Pass-by Sound during Amphibious Raid on SSTC-S**

| Sensitive Receptor | Source/Receptor Slant Distance (feet/meters) | Estimated One—Minute $L_{eq}$ (dBA) |
|---|---|---|
| Coronado Cays | 3,290 / 1,000 | 36 |
| Silver Strand State Beach | 3,200 / 970 | 36 |
| South Bay Biological Study Area | 2,860 / 870 | 37 |
| YMCA Camp Surf | 4,400 / 1,340 | 33 |
| Imperial Beach Residential Area | 5,810 / 1,770 | 31 |

Notes: $L_{eq}$ estimated from reference sound level of 91 dBA at 200 feet, assuming distance attenuation for a point source of about six decibels per doubling of source-receptor distance. Background sound level is assumed to be about 60-65 dBA during the day and about 45-55 dBA at night, depending upon location relative to SR-75.

Other training exercises on SSTC, such as Direct Action (DA) (up to eight helicopters), also require use of helicopters, but helicopter sound during DA activities would be lower than during Amphibious Raid activities because fewer helicopters participate. Sound from helicopter pass-bys would be below the typical daytime background sound level of about 60-65 dBA for receptors more than 900 feet from the sound source. Thus, aircraft activities associated with training at SSTC would seldom affect the acoustic environment on adjacent lands.

#### 3.6.2.2.2 Breacher Training

Breacher training (Activity 31, Table 2-1) is conducted quarterly at Bunker 98 and Bunker 99 on the inland portion of SSTC-S. Under the No Action Alternative, approximately 150 12-gauge shotgun blasts will occur per year. Breacher training occurs 45 days per year, so this training activity occasionally will affect the acoustical environment.

The sound of shotgun blasts was modeled for Breacher training events at Bunker 98 (Table 3.6-6), but these results also are applicable for training at Bunker 99. The closest sensitive receptors to Bunkers 98 and 99 are SBBSA and SSSB, which would experience peak sound levels of 100 dBP and 81 dBP, respectively. Noise levels at these receptors would be above the typical background noise level, but would be short in duration. Although noise from breacher training would be above the background sound level at sensitive receptors, impulse sound from breacher training would be intermittent (an average of about three shotgun blasts per day), and would not substantially affect the acoustic environment.

**Table 3.6-6: Shotgun Sound Levels at Sensitive Receptors During Breacher Training**

| Source | Sensitive Receptor | Source/Receptor Distance (feet/meters) | Peak Noise Level (PK-15, dBP) |
|---|---|---|---|
| Bunker 98 | Coronado Cays | 3,034 / 925 | 78 |
| | Silver Strand State Beach | 2,478 / 755 | 81 |
| | South Bay Biological Study Area | 1,315 / 401 | 100 |
| | YMCA Camp Surf | 5,254 / 1,601 | 71 |
| | Imperial Beach Residential Area | 5,502 / 1,677 | 75 |

Note: Peak noise levels modeled using the U.S. Army's BNOISE2 noise model and the source-receptor distances shown above. Model input and output on file with NAVFAC SW.

#### 3.6.2.2.3 Amphibious Training

Amphibious training involves numerous powered vehicles and equipment with a variety of sound signatures and intensities. About 10,000 landings of boats and amphibious vehicles occur annually at SSTC under the No Action Alternative.

One of the primary sources of sound associated with these activities is the LCAC; these vessels are used in the Amphibious Raid and Craft Landing Zone activities (Activities 25 and 27), for a total of six activities with eight LCAC landings per year under the No Action Alternative. LCAC landings would primarily occur on White 2 and Purple 1 Beach Lanes on SSTC-S, and Green 1 and 2 on SSTC-N; however, LCAC landings could occur at all SSTC Beach Lanes. Powered by four gas turbine engines, an LCAC produces sound in proportion to its load requirements. Sound from LCACs can range from 74 dBA (at idle) to 104 dBA (underway) at 100 feet from the source. Amphibious training events held at SSTC-S have the most potential for adverse sound effects from landing craft because of the proximity of sensitive receptors (Table 3.6-7).

**Table 3.6-7: Sound Effects of LCACs during Amphibious Landing Activities**

| Source | Sensitive Receptor | Source/Receptor Distance (feet/meter) | Estimated 5-minute $L_{eq}$ (dBA) |
|---|---|---|---|
| SSTC-S (Beach Lanes White 1 and Purple 2) | Coronado Cays | 3,250 / 990 | 49 |
| | Silver Strand State Beach | 3,160 / 960 | 49 |
| | South Bay Biological Study Area | 2,820 / 860 | 50 |
| | YMCA Camp Surf | 4,370 / 1,330 | 46 |
| | Imperial Beach Residential Area | 5,790 / 1,760 | 44 |
| SSTC-N (Beach Lanes Green 1 and 2) | Coronado Shores | 8,840 / 2,690 | 40 |
| | Rendova Housing | 5,110 / 1,550 | 45 |
| | Military Family Housing / Silver Strand Elementary School | 2,490 / 760 | 51 |
| | Coronado Cays | 10,210 / 3,100 | 39 |
| | Silver Strand State Beach | 7,490 / 2,280 | 42 |

Notes: Based on peak single LCAC sound emission when underway. $L_{eq}$ estimated from reference sound level of about 104 dBA at 100 feet), assuming distance attenuation for a point source of about six decibels per doubling of source-receptor distance. Background sound level is assumed to be about 60-65 dBA during the day and about 45-55 dBA at night, depending upon location relative to SR-75.

The effect of this source on sound levels in the community depends upon how long the LCACs remain in the training area, and whether they are idling or moving. LCACs approach and depart the training beach under power, but idle while on the beach, resulting in about five minutes underway and about 15 minutes of idle sound per 20-minute event. LCACs produce a peak sound level of about 65 dBA at a distance of approximately 280 feet when idle, and 8,900 feet when underway. Sound produced while LCACs are idling on the beaches is substantially less than sound produced while underway.

When underway, LCACs would produce 62 dBA, five-minute $L_{eq}$ and 50 dBA, five-minute $L_{eq}$ at the nearest sensitive receptors for SSTC-N and SSTC-S, respectively (see Table 3.6-7). Sound at the closest sensitive receptor would be below the typical daytime background sound level (assumed to be about 65 dBA).

Sources of sound from Logistics-Over-the-Shore training include boats, air compressors, cranes, generators, bulldozers, heavy trucks, and pile-drivers. Marine vessels and powered platforms mostly maneuver offshore, where sound-sensitive receptors are few. The infrequent movements of ships in support of training activities at SSTC would not contribute measurably to the background ambient sound level.

Piles are used to secure and support ELCAS (Activity 42, Table 2-1) in shallow water. Pile-driving produces intrusive sound events that are more annoying and distracting than continuous sound such as from traffic on SR-75, or than common single-event sounds, such as an aircraft pass-by, because the onset of intrusive sounds occurs without much buildup or warning. Piles are driven close to shore, and, although each ELCAS activity lasts for 14 days, pile driving is completed in 10 days. ELCAS training occurs in Red, Green, and Blue Beaches on SSTC-N surfside and on Bravo Beach at SSTC-N, but can also occur in all oceanside SSTC-N training lanes. In this section, only ELCAS training at Bravo Beach and Green Beach are quantitatively analyzed because these are the locations where training are most likely to occur (one in each location per year) and Bravo Beach has the shortest distance to source-receptors.

ELCAS training occurs 24 hours per day. Each pile requires about 15 minutes to drive. One pile is driven every two hours, for a total of about 10 to 12 piles per day. Each pile takes approximately 25-30 strikes per minute over the 15 minute period to be securely set. The sound source is intermittent. In between each pile (approximately 1 hour and 45 minutes), the driver is re-positioned, and sound levels are returned to low level equipment, near ambient levels. If the peak sound level for pile-driving is assumed to be about 100 dBA at a distance of 50 feet, then the 15-minute $L_{eq}$ would be about 97 dBA at 100 feet. The estimated peak sound levels and15-minute $L_{eq}$s at selected sensitive receptors are provided in Table 3.6-8.

**Table 3.6-8: Highest Sound Levels From ELCAS Installation Training at Bravo and Green Beaches**

| Source | Sensitive Receptor | Approximate Distance (feet/m) | Sound Level (dBA) | |
|---|---|---|---|---|
| | | | Peak | 15-min $L_{eq}$ |
| Pile-driving off Bravo Beach (reference distance 150 feet off-shore) | Coronado Shores | 13,530 / 4,110 | 51 | 48 |
| | Rendova Housing | 9,760 / 2,970 | 54 | 51 |
| | Military Family Housing / Silver Strand Elementary School | 320 / 100 | 84 | 81 |
| | Coronado Cays | 5,710 / 1,740 | 59 | 56 |
| | Silver Strand State Beach | 3,320 / 1,010 | 64 | 61 |
| Pile-driving off Green Beach (reference distance 150 feet off-shore) | Coronado Shores | 9,540 / 2,900 | 54 | 51 |
| | Rendova Housing | 5,830 / 1,772 | 59 | 56 |
| | Military Family Housing / Silver Strand Elementary School | 1,790 / 544 | 69 | 66 |
| | Coronado Cays | 9,490 / 2,885 | 54 | 51 |
| | Silver Strand State Beach | 6,770 / 2,058 | 57 | 54 |

Notes: $L_{eq}$ - equivalent noise level. Peak sound level and $L_{eq}$ estimated from reference sound level of 100 dBA at a distance of 50 feet and the source-receptor distances shown above, assuming distance attenuation of six decibels per doubling of source-receptor distance for a point source. Estimated sound is solely from the sources cited; the background sound levels at the receptors are assumed not to contribute substantially to the overall sound level.

Sound generated by pile-driving continues for long periods, dominating the acoustic environment in its vicinity. The values presented in Table 3.6-8 are for the sections of ELCAS that are installed closest to shore (about 150 feet), representing approximately the noisiest period of ELCAS installation. As the ELCAS is constructed, piles are driven further away from the shore, with the farthest pile being driving 1,200 feet from the shore.

The distance from the ELCAS pile installation activities to the 65 dBA, 15-minute $L_{eq}$ is estimated to be 2,000 feet. For training on Bravo Beach, this includes the Military Family Housing adjacent to Bravo Beach and Silver Strand Elementary School. Assuming that the building envelopes of the housing and school provide about 15 dBA of sound attenuation (with windows open), then interior sound levels would be about 66 dBA during pile driving, which could interfere with conversation (about 65 dBA at a distance of three feet) and other verbal communication (e.g., classroom activities), as well as disrupt sleeping. Excluding weekends, one 10-day ELCAS installation at Bravo Beach could affect Silver Strand Elementary School for up to 8 days per year, by intermittently disrupting the communication in classroom environments, if classes are being conducted during the training. The Military Family Housing area adjacent to Bravo Beach, especially housing units with a direct line of sight to the beach, could experience conversation interruption or sleep disruption during ELCAS installation training at Bravo Beach.

For training on Green Beach, Silver Strand Elementary School is outside of the 15-minute 65-dBA, $L_{eq}$ contour. However, the northern portion of the Military Family Housing may be within the contour. This housing area, especially the housing units closest to Silver Strand Highway, could experience intermittent conversation interruption or sleep disruption during ELCAS training on Green Beach. Building envelopes of the houses and the school would help to attenuate this noise. As the ELCAS is constructed and piles are driven farther away from the shore, received noise levels would be reduced and much of this housing would fall outside of the 65-dBA contour.

Background sound levels in urban areas are substantially lower during late night and early morning hours than during the day; pile-driving during these portions of the day may be especially noticeable. Background sound levels in urban areas tend to be lower on the weekend, especially on Sundays. ELCAS installation during these periods may be perceived as more intrusive than during the week. Because the background sound level would be lower, the sound would be more audible at beaches, parks, and other recreational areas farther from the training area. Twenty days per year of repetitive, intrusive sound might be unpleasant for some occupants and beach park users, but would not substantially alter the long-term ambient sound environment in the community.

Other elements of the ELCAS installation, including bulldozers, heavy trucks, and cranes, would contribute to intrusive sound associated with this training activity. Generators and air compressors contribute continuous sources of sound. Sound from these additional sources would not be noticeable at the distances shown in Table 3.6-8 because it would be below the background sound level.

#### 3.6.2.2.4 Munitions

Under the No Action Alternative, several training activities involve setting off blasting caps, grenade simulators, or explosives, or firing blanks. Floating Mine training activities include 25 events per year in which about one blasting cap each is detonated, for a total of 25. Because the tempo of activities is low, these events would have minimal, short-term effects on the acoustical environment.

About 358 training events held per year for 17 types of land training include the firing of blanks or simulated munitions (known as “simunitions”). One intense use of blanks occurs during Immediate Action Drills (IAD) exercises, when up to 625 blanks per hour may be fired (assuming an eight-hour event over five days), that occur primarily on Red Beach Lanes. These events occur at SSTC-N, SSTC-S, or on the NASNI beaches. A blank produces a peak sound level of about 99 dBA at a distance of 350 feet.[1] Six hundred and twenty five blanks fired within an hour from the same approximate location at SSTC-N produce an hourly $L_{eq}$ of about 75 dBA at the closest sensitive receptor (Rendova Housing area, Table 3.6-9), Six hundred and twenty five blanks fired within an hour from the same approximate location at SSTC-S produce an hourly $L_{eq}$ of about 73 dBA at the closest sensitive receptor (SBBSA, Table 3.6-9).

[1] Small arms firing can produce peak noise levels of 90 to 100 dB at 500 feet and 80 to 90 dB at 1,000 feet for the most common types of small arms. Most blank ammunition for small arms has a smaller propellant charge than that used for live ammunition. As a result, noise from small arms blank ammunition generates noise levels about four decibels below those of live ammunition, or about 96 dB at 500 feet, 102 dB at 250 feet, and 108 dB at 125 feet (assumes 6 dB per doubling of distance).

**Table 3.6-9: Sound from Blanks used during Immediate Action Drills**

| Sensitive Receptor | Approximate Distance (feet/m) | Sound Level (dBA) | |
|---|---|---|---|
| | | Peak | One-Hour $L_{eq}$ |
| Coronado Shores | 5,950 / 1,810 | 74 | 67 |
| Rendova Housing | 2,260 / 690 | 83 | 75 |
| Military Family Housing / Silver Strand Elementary School | 5,370 / 1,630 | 75 | 68 |
| Coronado Cays | 13,110 / 3,990 | 68 | 60 |
| Silver Strand State Beach | 10,390 / 3,160 | 70 | 62 |
| Coronado Cays | 2,560 / 778 | 80 | 72 |
| Silver Strand State Beach | 890 / 271 | 80 | 72 |
| South Bay Biological Study Area | 8,790 / 2,672 | 81 | 73 |
| YMCA Camp Surf | 16,520 / 5,022 | 77 | 69 |
| Imperial Beach Residential | 13,820 / 4,201 | 75 | 67 |

Note: Peak noise levels and $L_{eq}$'s estimated from reference sound level of 99 dBA at 350 feet and the source-receptor distances shown above, assuming distance attenuation of six decibels per doubling of source-receptor distance for a point source.

Hell Week activities occur six times per year, including an early morning breakout from buildings on the western side of SR-75 across from NAB Main Base and training at the existing Demo Pit on SSTC-N. Community sound levels are very low during early morning hours, so discrete sound events may be audible at greater distances from the source. Up to fifteen thousand 7.62-mm and up to two thousand 0.50-caliber blanks may be fired annually for the six Hell Week breakouts, or about 2,830 blanks per breakout. Assuming that the breakout event occurs over a one-hour period, all blanks are fired from approximately the same location, and no attenuation results from barriers between the source and receptor, this quantity of blanks would generate a peak sound level of about 91 dBA at Rendova Housing area (approximately 890 feet away), with a hourly $L_{eq}$ of about 90 dBA and a peak sound of 82 dBA at Coronado Shores (approximately 2,560 feet away) with an hourly $L_{eq}$ of 81 dBA (Table 3.6-10).

**Table 3.6-10: Sound from Blanks used During Hell Week Activities**

| Source | Sensitive Receptor | Source-Receptor Distance (feet/m) | Sound Level (dBA) | |
|---|---|---|---|---|
| | | | Peak | 1-hr $L_{eq}$ |
| Breakout Compound (west side of SR-75 across from NAB) | Coronado Shores | 2,560 / 780 | 82 | 81 |
| | Rendova Housing | 890 / 270 | 91 | 90 |
| | Military Family Housing/ Silver Strand Elementary School | 8,790 / 2,670 | 71 | 70 |
| | Coronado Cays | 16,520 / 5,020 | 66 | 65 |
| | Silver Strand State Beach | 13,820 / 4,200 | 67 | 66 |
| Demolition Pit on Blue 1 Beach | Coronado Shores | 10,560 / 3,210 | 69 | 51 |
| | Rendova Housing | 6,850 / 2,080 | 73 | 55 |
| | Military Family Housing/ Silver Strand Elementary School | 760 / 230 | 92 | 74 |
| | Coronado Cays | 8,460 / 2,570 | 71 | 53 |
| | Silver Strand State Beach | 5,740 / 1,750 | 75 | 56 |

Note: Peak noise levels and $L_{eq}$'s estimated from reference sound level of 99 dBA at 350 feet and the source-receptor distances shown above, assuming distance attenuation of six decibels per doubling of source-receptor distance for a point source.

Intervening structures can reduce the sound level at offsite sensitive receptors by 15 to 20 dBA.

At this time of day, a peak sound event of this lesser magnitude (about 76-67 dBA) is above the expected background sound level of < 60 dBA. The Hell Week Breakout is located across SR-75 from NAB Main

Base, where few sensitive receptors would be exposed to this sound. Such a sound level in this area of Coronado six times per year in the early morning may disturb some visitors or residents in the Military Family Housing or Coronado Shores. The use of up to 100 grenade simulators per year (about 16-17 per training activity) would not add substantially to the overall sound level; due to the nature of logarithmic addition, an increase from 2,830 to 2,847 noise events of similar magnitude would not perceptibly change the hourly average $L_{eq}$.

Hell Week events at the Demolition Pit on Blue 1 Beach, occurring primarily on weekdays, include the use of about twelve thousand 7.62-mm blanks and 100 grenade simulators annually. The Demolition Pit is located on the beach opposite Fiddlers Cove, where loud sounds may affect the Military Family Housing area and Silver Strand Elementary School (approximately 760 feet away). Assuming that these activities take place over five 8-hour days, then an average of about 50 blanks may be fired per hour; these blanks can generate an hourly $L_{eq}$ of about 74 dBA at the military housing area and the elementary school.

The events described above (Over-the-Beach [OTB] exercises, Hell Week breakout and demolition pit sound) may be distracting to individuals in nearby public areas. Sound levels at Rendova Housing and Military Family Housing on Silver Strand would be above typical urban daytime background sound levels. Hell Week activities take place primarily during the day, so most residents would not be home. Residents indoors would experience a lower sound level than those participating in outdoor activities.

#### 3.6.2.2.5 Foot and Vehicle Traffic

Land training activities, other than those addressed under separate subsections above, consist mostly of movements of groups of trainees on foot across the beach and movements of passenger vehicles on the beach or on established roads in SSTC. These activities are not substantial sources of offsite sound.

Three physical training activities; Physical Conditioning Runs, Physical Conditioning Training, and Hell Week (Activities 68, 69, and 71, Table 2-1) include having large groups of trainees running through off-base areas, and sometimes calling or singing out a cadence. These activities occur about 750 times per year, or an average of about three times per day. Depending upon the number of individuals participating, the combined voices of these groups can be heard in adjacent public areas.

A single person shouting can generate peak sound of approximately 88 dBA at 3.3 feet (one meter) (Harris 1997). Sound from shouting would decline to about the background sound level (65 dBA) within approximately 50 feet. Assuming 100 personnel would participate in an exercise, a one-minute $L_{eq}$ would be below the typical urban daytime background sound level for all identified sensitive receptors except SSSB. During early morning hours, when background noise levels in adjacent areas may be less than 50 dBA, such sounds may be heard at substantially greater distances. Personnel run along the hard- and soft-pack sand on SSSB. Sound from personnel calling out during running may temporarily disturb public use, but would pass quickly, based on the purpose of the training exercises.

#### 3.6.2.2.6 Summary – No Action Alternative

Overall, existing military training activities on SSTC include several sources of sound, primarily impulsive sound events, that are audible in adjacent residential, commercial, recreational, and open space areas in both Coronado and Imperial Beach. Major sources of sound include helicopters used for insertion and extraction of exercise participants, amphibious vessels involved in landing exercises, pile-drivers involved in ELCAS training, and munitions used in a variety of exercises. Collectively, these sources generate sound on a majority of weekdays and infrequently at night and on weekends.

Coronado Shores would be minimally affected by training at SSTC. Blanks and simunitions would be the primary sound sources that personnel may hear at Coronado Shores. Although peak sound events would be audible during the day, the hourly $L_{eq}$ would be below the typical urban background sound level. Other training exercises, such as ELCAS or LCAC landings, are located a substantial distance from Coronado Shores, and would be below the background sound level. Coronado Shores is primarily residential, and daytime sound would not be expected to have a substantial effect because most residents would be at work, school, or participating in other daytime activities. Training exercises held at night or in the early morning (Hell Week) could infrequently annoy residents because the background sound level is lower at night.

Rendova Housing would be primarily affected by sound from the use of blanks or simunitions during training exercises. Sound from amphibious landings, helicopter overflights, and ELCAS training would be below the typical urban background sound level. Residents of Rendova Housing could experience peak outdoor sound of about 75-90 dBA from blanks and simunitions on SSTC-N, but these events would be infrequent. Peak sound within structures could be about 55 to 75 dBA. Intermittent impulsive noise at this level may interrupt conversations, distract individuals, or interfere with sleep. Although these sound levels could affect residents, particularly at night, these sound levels represent the most intense use of blanks during training on SSTC-N. Most training exercises would occur during the day, when residents are not home, and would be short in duration.

Sound from SSTC training would have the greatest effect on the Military Family Housing across from Boat Lanes 7-10 and on Silver Strand Elementary School. ELCAS training on Bravo Beach may produce sound levels at the Military Family Housing of up to 81 dBA, 15-minute $L_{eq}$ during pile driving, which would occur periodically during the day and night. Intermittent impulsive noise at this level may interrupt conversations, distract individuals, or interfere with sleep. ELCAS training would only occur twice per year under the No Action Alternative, but may disrupt the classroom environment during the day and disturb residences during the evening and night. Intermittent pile-driving (one pile every two hours) would have a greater effect on the houses that are closest to Bravo Beach during training at Bravo Beach, and on the houses closest to the Highway for training on the Oceanside beach lanes. Sound from blanks and simunitions used during Hell Week could produce an hourly $L_{eq}$ of about 74 dBA at Military Family Housing and the Elementary School, which would be above the typical daytime urban background sound level. Training exercises early in the morning would have a greater effect on residents than those occurring later in the day because the background sound level is lower at that time.

Residences of Coronado Cays would not be affected by SSTC training during the day because training sound levels at the near edge of this development would be below the assumed daytime background sound level. Sound at night may temporarily disturb residents who are eating dinner, relaxing, or sleeping, but these sound events are not expected to interrupt normal nighttime routines. Residences closest to the near edge of the development would experience the highest sound levels, but few training exercises occur at night.

Residential areas of Imperial Beach, including Westview Elementary School, would be minimally affected by sound from SSTC training. Sound from Breacher Training may be audible, but would be intermittent (only 150 shotgun blasts per year). Sound from other training exercises would be below background sound levels. Residents indoors would not be expected to be affected by training sound because the building envelope would reduce interior sound levels by about 15 dBA. Sound levels may be audible to residents participating in outdoor activities, but sound would not disrupt activities or normal routines.

Public use of SSSB would be minimally affected by SSTC training. Sound from large-scale training exercises at SSTC-S and SSTC-N would produce sound levels at SSSB below the typical daytime background sound level. Sound from SR-75, breaking surf, and wind would all contribute to the background sound level. Intermittent sound would not be expected to startle recreationalists on the beach because of the low received sound level. Overnight use of the beach is in enclosed vehicles only, which further reduces the perceived sound level.

Public use of SBBSA may experience intermittent sounds from Breacher Training. Sound from other training exercises at SSTC-S would be below the background sound level. Sound from Breacher Training would occur infrequently, with 150 shotgun blasts per year. Peak sound from blanks and simunitions during beach training events such as IADs may be up to 81 dBA. Public use of SBBSA is for outdoor recreation; and public use is not likely to be disrupted by occasional impulsive sound from SSTC training events.

YMCA Camp Surf is located in the southern portion of SSTC-S, and would experience minimal levels of sound from SSTC training. Intermittent sound from Breacher training may be audible at YMCA Camp Surf, but would not be loud enough to substantially disrupt outdoor activities. Other training activities would not be expected to affect outdoor recreation because sound levels would be below the typical urban nighttime background sound level. SSTC nighttime training activities may be audible, but are not expected to startle individuals or disrupt overnight activities at Camp Surf because sound produced by breaking surf and blowing winds would mask training noise.

### 3.6.2.3 Alternative 1 (Preferred Alternative)

#### 3.6.2.3.1 Vehicle Traffic on Public Roads

Future traffic volume increases on SR-75 associated with training on SSTC, the only high-volume, high-speed road in the area, would be insufficient to noticeably affect ambient sound levels in the ROI. Increases in vehicle traffic on other local roads likewise would have no substantial effect on ambient sound levels. Military traffic on local roads would be a minor portion of this traffic. Thus, project-related traffic sound would not substantially affect the acoustical environment under Alternative 1.

#### 3.6.2.3.2 Aircraft

Under Alternatives 1 and 2, up to 1,643 helicopter sorties may be generated by SSTC training events (Appendix C), an increase of about 120 percent relative to the No Action Alternative, or by about 2,347 hours per year. Approximately 150-200 helicopters would fly into SSTC-S inland under Alternatives 1 and 2. The remaining 1,450 to 1,500 helicopter operations occur offshore in the boat lanes or bay training areas. No helicopters hover over beaches.

The most substantial increase in helicopter operations from baseline to Alternatives 1 and 2 would be 386 new MH-60 minehunting operations (N4, N5, N6, and N7), which would occur in the western portions of the boat lanes. The Amphibious Raid activity (Activity 25, Table 2-1) would continue to represent the most intense aircraft sound event at SSTC. The frequency of these events would increase to 18 per year under Alternative 1. This increase in the frequency of intrusive sound events would be noticeable to the public. Sound levels produced by helicopters during Amphibious Raid exercises would be the same as under the No Action Alternative.

One new training activity under Alternative 1 would be Tactical Recovery of Aircraft and Personnel (TRAP) (N9, Table 2-2), to be held on SSTC-S. This operation would employ up to five helicopters at once, would occur at night, and would last one to two hours. Due to the logarithmic nature of sound increases, and assuming that the helicopters would be evenly spaced over a large area, the maximum sound level at the nearest receptor from this operation would be about the same as from eight helicopters during the Amphibious Raid activities. However, if helicopter arrivals and departures occurred over a longer period, then the length of time that sound-sensitive receptors were affected would increase.

However, the effect of these increases on distribution over average hourly community sound levels would be negligible because the intensity and location of helicopter use during the individual events would not change. Thus, the effects of aircraft activities at SSTC under Alternative 1 would be about the same as described for the No Action Alternative.

#### 3.6.2.3.3 Breacher Training

Under Alternative 1, Breacher training would occur 20 times per year, with approximately five days per exercise. Breacher training (Activity 31, Table 2-1) would still be conducted at Bunker 98, Bunker 99, plus an additional training at a site west of Bunker 99 on the inland portion of SSTC-S. Breacher training at Bunker 98 would be closest to sensitive receptors. Shotgun blasts would increase to 1,400 annually, but the intensity of this sound source under Alternative 1 would be the same as under the No Action Alternative (Table 3.6-6).

Sensitive receptors adjacent to SSTC-S would experience the same noise levels as under the No Action Alternative, but the number of noise events would substantially increase. Breacher training would occur during daylight hours. Impulsive sound from shotgun blasts would have less of an effect on sensitive receptors than predicted by modeling because of the background sound generated by SR-75. With approximately 1,400 shotgun blasts per year (approximately 14 per day when Breacher training occurs), sound from shotgun Breacher training would be intermittent, and would not substantially affect the acoustic environment.

#### 3.6.2.3.4 Amphibious Training

Amphibious craft landings at SSTC would increase from about 10,000 landings per year under the No Action Alternative to about 13,800 landings per year under Alternative 1. LCAC landings would increase from 8 to 40 per year, a roughly five-fold increase. The level of complaints in the community from sound associated with LCAC training could increase slightly. However, the frequency, duration, and intensity of intrusive sound from amphibious training would be too low to measurably affect long-term average community sound levels.

Under Alternative 1, Logistics Over-the-Shore training activities would increase slightly to 270 events per year over the No Action Alternative. The locations where Causeway Pier Insertion and ELCAS training take place would remain the same as under the No Action Alternative. Estimated sound levels from ELCAS training at the nearest sound-sensitive receptors would be as shown in Table 3.6-8. With an increase in training rates from two events to four events per year (20 days of pile driving activities to 40 days of pile driving; piles are driven for approximately 15 minutes every two hours), the exposure of nearby sensitive receptors to the sound levels projected for this activity would double. ELCAS training could interrupt verbal communication and disrupt sleep in the Military Family Housing area and Silver Strand Elementary School when piles are being driven at Bravo Beach, but would not have an effect on the long-term acoustical environment.

#### 3.6.2.3.5 Munitions

Under Alternative 1, several training activities involve setting off blasting caps or explosives, or firing blanks. Floating mine training activities include 53 events per year in which a single blasting cap is detonated. A blasting cap generates a sound level of about 99 dBA at a distance of about 350 feet; the distance to the 65 dBA contour would be about 3.3 miles. However, because the tempo of activities is low—about one event per week—and the distance from which these activities would occur offshore, these events would have minimal effect on the long-term acoustical environment in areas of public use.

Alternative 1 would include a new training activity that uses blanks—TRAP. TRAP would require up to 1,250 discharges of blanks per activity. TRAP would occur four times per year, with an additional potential 5,000 blanks per year being expended. Each activity would be conducted over a four-hour period, so about 300 blanks would be discharged per hour (about five per minute). At the reference distance of 350 feet, these discharges would generate an hourly average sound level ($L_{eq}$) of about 88 dBA.

Under Alternative 1, the annual number of blanks or simunitions used during training would increase by about 16 percent (394,000 vs. 341,000) relative to the No Action Alternative (see Appendix C). The sound generated from the firing of a single blank would be as described for the No Action Alternative. Peak sound levels from the noisiest training events (e.g., Swimmer / Combat Rubber Raiding Craft OTB, Hell Week Breakout, Hell Week Demolition Pit) would not change. However, the total number of sound-generating training activities would increase by approximately 48 percent.

#### 3.6.2.3.6 Foot and Vehicle Traffic

Land training activities, other than those addressed under separate subsections above, consist mostly of movements of groups of trainees on foot traversing the beach. These activities are not substantial sources of offsite sound.

Similar to the No Action Alternative, three physical training activities; Physical Conditioning Runs, Physical Conditioning Training, and Hell Week (Activities 68, 69, and 71, Table 2-1) include having large groups of trainees running through off-base areas and calling or singing out a cadence. However, the number of these activities would not increase under Alternative 1; the effects on adjacent land uses would be the same as under the No Action Alternative.

#### 3.6.2.3.7 Summary – Alternative 1

Training increases under Alternative 1 would minimally affect the acoustic environment at Coronado Shores. Use of blanks and simunitions would increase slightly (approximately 16 percent), but the sound levels for individual activities would be the same as under the No Action Alternative. Although peak sound would be audible during the day, the hourly $L_{eq}$ would be below the background sound level. The number of exercises with intensive use of blanks and simunitions would increase slightly. Nighttime and early morning training exercises that would use blanks and simunitions (Hell Week) could affect residents in the early morning, but the number of Hell Week training exercises would remain the same as under the No Action Alternative.

Residents of Coronado Shores would continue to be minimally affected by training at SSTC under Alternative 1. Blanks and simunitions would be the primary sound sources that personnel may hear at Coronado Shores. The hourly $L_{eq}$ would continue to be below the typical urban background sound level during the day. Training exercises held at night or in the early morning (Hell Week) would have the same effects as under the No Action Alternative, as the tempo and location of training would not change.

Residents of Rendova Housing would be primarily affected by sound from the use of blanks or simunitions during training exercises at SSTC-N. The number of blanks used during training would increase by 16 percent under Alternative 1, but the majority of training exercises would occur during the day, when residents are at jobs, school, or participating in outdoor activities. The training activities with the most intense use of blanks could disturb residents, particularly if they occurred at night. This disturbance could include interference with communication, distraction, and – for night and early morning activities – sleep disturbance.

Sound from SSTC training would continue have the greatest effect on the Military Family Housing across from Boat Lanes 7-10 and on Silver Strand Elementary School. Sound from ELCAS training would increase under Alternative 1. ELCAS training would increase from two to four exercises per year.

ELCAS training on Bravo Beach would produce sound levels of up to 81 dBA, 15-minute $L_{eq}$ during pile driving, which would occur several times per day. The increase in training activities would result in 20 additional days of pile driving per year. This activity could effect the residences closest to ELCAS training and on Silver Strand Elementary School, including interference with speech and hearing, distraction, and – for night and early morning activities – sleep disturbance, Sound from blanks and simunitions used during Hell Week would remain the same as under the No Action Alternative. Sounds from blanks and simunitions used during Hell Week would remain the same under the No Action Alternative, as the tempo and location of training would remain the same.

As in the No Action Alternative, Residences of Coronado Cays would not be substantially affected by increases in SSTC training under Alternative 1 because sound levels at the near edge of this development would be below the background sound level. The increase in the number of Breacher Training activities would increase the number of intermittent sound events, but these events would primarily occur during the day. Sound during the night may temporarily distract residents who are eating dinner, relaxing, or sleeping, but would not be expected to substantially disturb normal nighttime routines.

Public use of SSSB would be minimally affected by increases in SSTC training under Alternative 1. Sound from intensive training exercises at SSTC-S and SSTC-N would produce sound levels below the daytime background sound level. Sound from SR-75, breaking surf, and wind would contribute to the background sound level. Intermittent sound from training activities would not be expected to startle recreationalists on the beach because of the low received sound level.

Public use of SBBSA would experience a large increase in intermittent sounds from Breacher Training, from 150 shotgun blasts under the No Action Alternative to 1,400 shotgun blasts per year under Alternative 1. Sound from other training exercises at SSTC-S would be below the typical urban background sound level. Sound from Breacher Training would occur infrequently, and primarily during the day. Public use of SBBSA is for outdoor recreation; and public use is not likely to be disrupted by occasional impulsive sound from SSTC training events.

YMCA Camp Surf would experience minimal levels of sound from the increase in SSTC training. Intermittent sound from Breacher training may be audible at YMCA Camp Surf, but sound levels would not be loud enough to substantially disrupt outdoor activities. Other training activities would not be expected to affect outdoor recreation because sound levels would be below the background sound level.

Residential areas in Imperial Beach, including Westview Elementary School, would not be affected by sound from SSTC training because of the substantial distance from training sound sources. Sound from Breacher Training could be audible during the night, but this training activity occurs primarily during the day. Sound from other training exercise would be below background sound levels.

Overall, proposed military training activities on SSTC would generate noticeable sound on weekdays during the year, primarily as impulsive events that would be audible in adjacent residential, commercial, recreational, and open space areas in both Coronado and Imperial Beach. Major sources of sound would include helicopters used for insertion and extraction of exercise participants, amphibious vessels involved in landing exercises, pile-drivers involved in ELCAS training, munitions used in a variety of exercises, and explosives used in demolition pit and breacher training exercises. Collectively, these sources would generate noise on weekdays and infrequently at night and on weekends.

### 3.6.2.4 Alternative 2

The only substantive difference between Alternative 1 and 2, with regard to the acoustic environment, is that all SSTC-N beach training areas would be available for use, regardless of time of year. As a result of this increased availability, some training exercises may be conducted on SSTC-N Beach Lanes 8-10 when availability is limited on SSTC-N Beach Lanes 1-7 or if the beach lanes provide attributes more conducive to training than other available lanes. This shifting of activities is expected to be minimal, and the largest sound generating activities are not expected to shift into Lanes 8-10. The SSTC-N lane access change is not expected to affect long-term average sound levels. There would be no increase in the number of training exercises from Alternative 1 to Alternative 2. Therefore, impacts associated with Alternative 2 are expected to be the same as those described above for Alternative 1. Under Alternative 2, the proposed change in access to and availability of existing beach and inland training areas would not result in sound impacts noticeably different than those identified for Alternative 1.

### 3.6.3 Proposed Mitigation Measures

Current mitigation measures (Section 3.6.2) would continue to be implemented for Navy training at SSTC.

### 3.6.4 Unavoidable Adverse Environmental Effects

Under the alternatives, sound produced during training exercises would be unavoidable; however, the majority of the sound from training activities would be below background levels at surrounding sensitive receptors.

### 3.6.5 Summary of Effects

Table 3.6-11 summarizes potential effects on the acoustic environment near SSTC from military activities identified in the alternatives including the Proposed Action.

**Table 3.6-11: Summary of Effects**

| Alternative | Summary of Effects |
|---|---|
| **No Action Alternative** | • Existing ambient sound levels include sounds from various sources. Training at SSTC-S occasionally creates intrusive sound for short periods, especially during Amphibious Raid and Breacher training. Training at SSTC-N occasionally creates intrusive sound for short periods, especially during ELCAS installation training. Helicopter overflights and ship pass-bys of populated land areas would be audible for a few minutes per day in any one area, without contributing substantially to the long-term average sound level. Small arms (blanks) firing occasionally is audible for short periods in portions of the community. Routine on-site and off-site training-related activities, such as the operation of powered vehicles and equipment, add incrementally to the ambient background sound level, especially during weekdays. Taken together, these sound sources affect the acoustic environment of Silver Strand peninsula. |
| **Alternative 1** | • Sound levels generated by training would remain the same as the No Action Alternative, but training events producing sound would increase in frequency. Alternative 1 would increase the frequency of aircraft and amphibious vehicle training, ELCAS pile driving, shotgun Breacher activities, and use of blanks on the beach. |
| **Alternative 2** | • The effects of Alternative 2 on the acoustical environment are expected to be the same as the effects described under Alternative 1. |
| **Mitigation Measures** | • Activity planning often considers location (e.g., Breacher training activities are located in inland areas) and time of day. The Navy notifies local emergency personnel prior to exercises that include pyrotechnics or blanks. Call-outs during physical conditioning training are minimized at night and when in residential areas. |

# 3.7 Marine Biological Resources

## 3.7 MARINE BIOLOGICAL RESOURCES OVERVIEW

This section begins with an overview of the affected marine environment of the Silver Strand Training Complex (SSTC) by describing habitat types in the Region of Influence (ROI) and their acreages, followed by the communities associated with these habitats. The habitats are organized by tidal depth from shallow to deep. The organisms that comprise the communities are described by species group in greater detail in the sections that follow this overview, beginning with Marine Plants and Invertebrates (Section 3.7.1.3.2). Chapters on Fish, Marine Mammals, and Sea Turtles follow (Sections 3.8, 3.9, and 3.10). Terrestrial Biological Resources are then addressed (Section 3.11). Birds are described separately from terrestrial or marine biological resources (Section 3.12) because they cross the terrestrial-marine interface (sea turtles and marine mammals stay aquatic in SSTC training areas). All of the following chapters and their respective descriptions of individual species groups, marine habitats, or marine communities reference back to this introductory overview, as appropriate. Abundance and diversity of these species groups are quantified if possible, to provide a full picture of the functions provided by the affected environment. The current management of these resources in the ROI is also provided, as appropriate.

### 3.7.1 Affected Environment

#### 3.7.1.1 Definition

This section describes the habitat types and the biotic communities expected to be present in the SSTC area that potentially could be affected by the Proposed Action. The potential effects are analyzed, and a discussion is presented concerning current management and mitigation practices.

#### 3.7.1.2 Regional Setting

The project area is in the eastern Pacific Ocean coastal region referred to as the Southern California Bight (SCB) and is directly affected by two ocean currents. The colder, more northerly California Current and the southern, warm-water Davidson Current influence the ocean within the SCB. These two currents “mix” in the Santa Barbara Channel. The water within the southern portion of the SCB is generally warmer and more saline than that within the northern area (Hickey 1993). These differing conditions, as well as upwelling of cooler, nutrient-rich waters, influence the unusually diverse marine biota within the SCB (Murray and Littler 1981). The offshore portion of SSTC is adjacent to the mouth of San Diego Bay and is comprised of primarily sandy soft bottom surf zone habitat interspersed with low relief rocky cobble habitat within the coastal pelagic zone.

In the coastal zone and waters of San Diego Bay, biological conditions mirror that of southern California’s other coastal bays and estuaries. San Diego Bay is located in an arid region of Mediterranean climate and is fed by small, seasonal rivers and streams. As a result, the fish assemblages are largely devoid of freshwater and anadromous species and are dominated by estuarine resident and marine migrant fishes (Allen et al. 2006). Unlike the majority of southern California bays and estuaries, San Diego Bay is comparatively large and, therefore, displays considerable habitat diversity and environmental gradients. These gradients are especially apparent during the winter months when most rainfall occurs.

The sheltered waters function as a nursery for fish and a stopover and rest area for migratory birds. They also support a number of endemic or rare fish and wildlife species. San Diego Bay supports local resident fishes and birds, as well as those that migrate to and from these waters for specific life cycle needs, including harvested fish such as California halibut (*Paralichthys californicus*), and important prey of larger fish, seabirds, and marine mammals, such as northern anchovy (*Engraulis mordax*).

San Diego Bay contributes more protected, shallow, bay habitats to the Pacific Flyway waterbird populations than any other bay or estuary situated along the 180-mile coastal region of southern

California. When compared to midwinter populations of the SCB, San Diego Bay provides habitat for more than half of the entire midwinter duck population. The majority of the regional surf scoter (*Melanitta perspicillata*, 72 percent) and brant (*Branta bernicla*, 66 percent) populations were present in central and south Bay. Forty-four percent of the region's bufflehead population used central and south bay in 1994, as did a similar percentage of scaup (U.S. Fish and Wildlife Service 1995a). Thirty-one percent of the midwinter brant population used central and south bay (U.S. Fish and Wildlife Service [USFWS] 1995a). San Diego Bay provides breeding, wintering, and/or stopover habitat for most of the shorebirds identified in the U.S. Shorebird Plan as having primary importance within the region.

The SSTC and San Diego Bay are situated within an urban context where there is intense shore and water use, both current and historical. In immediate proximity to the largest naval complex in the world and California's second largest incorporated city, San Diego Bay receives water and urban runoff from a watershed of 415 square miles where 50 percent of the county's population lives or works. The legacy of historical dredging, filling, direct sewage delivery, and pollutants that still persist in "hot spots" have modified the benthic environment that supports marine plants and invertebrates. The extent of this modification is such that biological assemblages have changed in comparison to past marine communities. While San Diego Bay's military history began very early at the turn of the 20$^{th}$ Century with World War I, major filling of marshlands and deepening of the bay were primarily related to its development as a commercial harbor beginning in the late 1800s and first half of the 20$^{th}$ century, rather than to military use. Due to this history, San Diego Bay is listed as an impaired water body, under Clean Water Act (CWA) Section 303[d], by the California State Water Resources Control Board (SWRCB) due to identified pollutants (Regional Water Quality Control Board [RWQCB] 2007). The 1997 National Sediment Quality Survey determined that San Diego Bay, San Francisco Bay, and offshore areas around San Diego and Los Angeles appear to have the most significant sediment contamination in the Environmental Protection Agency's (EPA) Region 9 (USEPA 1997). Major contaminants found in San Diego Bay include chlorinated hydrocarbons, polychlorinated biphenyls, toxic components of petroleum hydrocarbons, polynuclear aromatic hydrocarbons, heavy metals, and organotins such as tributyltin (DoN 1998).

An added pressure on the marine communities has been the depletion and modification of the habitats in the region from their historical condition. Compared to historical acreages, there has been a 70 percent loss of salt marsh, 84 percent loss of intertidal areas other than salt marsh, and a 42 percent loss of shallow subtidal waters. Conversely, since San Diego Bay was first dredged in 1914, deep water habitat has doubled. Available shoreline habitats have also experienced physical alteration, with 74 percent of the shoreline now armored with artificial hard structures, a type of substrate not native to San Diego Bay. Upland transition areas needed by many species are now scarce and have been converted to urban uses such as military, commercial and residential development, and public facilities and infrastructure. Fresh water and sediment that were formerly delivered to San Diego Bay by several rivers and creeks are now almost completely impounded by dams and have been replaced by storm water flows.

While San Diego Bay's habitat losses are similar to those of other bays, this complicates an assessment of impacts due to local causes versus regional or more distant causes. Native wildlife that are increasing in number, include the more generalist species and those tolerant of human disturbance such as the western gull (*Larus occidentalis*), common raven (*Corvus corax clarionensis*), and American crow (*Corvus brachyrhynchos hesperis*). Shrinking habitat locally, regionally, and along the entire Pacific Flyway is probably the most important issue to survival of many birds dependent on San Diego Bay (e.g. Brown et al. 2001, Shuford and Gardali 2008).

### 3.7.1.3 Region of Influence

The marine ROI can be partitioned into three zones: 1) the bayside training zones within the San Diego Bay (sandy beaches, mudflats, and the nearshore environment); 2) portions of the intertidal to nearshore (<0.5 nautical miles [nm]) ocean area off the southern beaches of Naval Air Station, North Island (NASNI); and 3) the intertidal to nearshore (<3 nm) ocean area encompassing the training lanes at SSTC-N and SSTC-S, and ocean anchorages. The marine ROI encompasses an array of habitat types controlled to various degrees by bathymetry, hydrology, temperature, salinity, and substrate type (Section 3.5 Water Resources and 3.7.1.3.1 Marine Habitats Overview). The influence of these factors results in habitat partitioning into distinct environments that contain species indicative of those environments (Figure 3.7-1). The interaction of physical bottom substrate and the overlying water column, in conjunction with the mixing of bay and ocean waters, is complex considering tidal fluctuation, freshwater input, and circulation.

#### 3.7.1.3.1 Marine Habitats Overview

Marine habitats vary by depth (bathymetry), tidal inundation, bottom substrate, and whether they are vegetated or unvegetated. There are other factors that define habitat condition, but these are the fundamental variables by which mapping has taken place in the ROI. Figure 3.7-2 provides an overview of the bathymetry in the vicinity of the ROI and Figure 3.7-3 provides an overview of marine habitats based on vegetation and substrate.

#### San Diego Bay Habitats

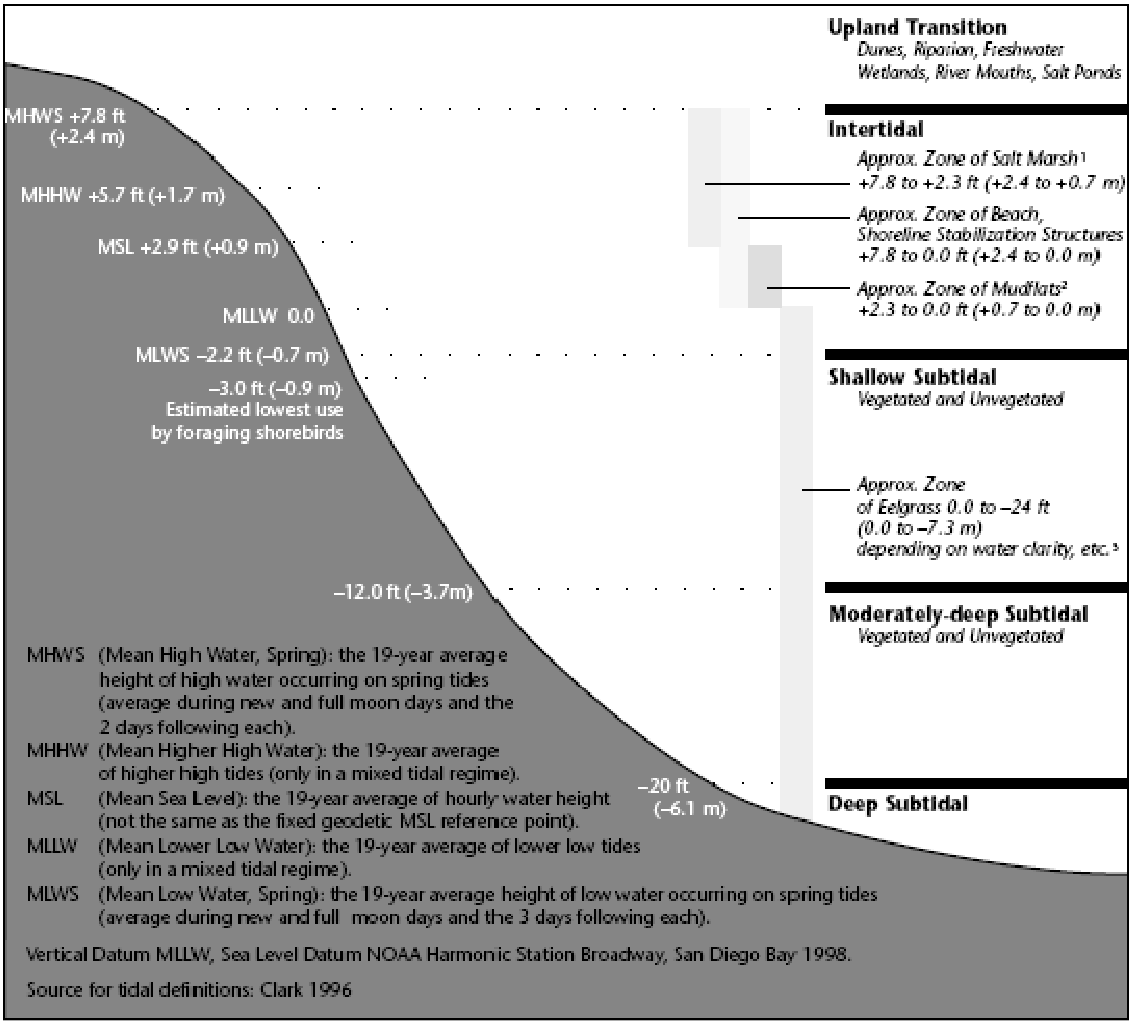
Figure 3.7-3 depicts current ROI vegetation and substrate data, and Figure 3.7-4 shows the habitat areas broken down with depth categories added, focusing on the bayside training areas. The acreages shown in these figures are reported in Table 3.7-1, which lists the total acreage of submerged habitat types in San Diego Bay. Table 3.7-2 lists the acreages within the SSTC training area, and the proportion of these habitats in the SSTC compared to the entire San Diego Bay.

##### *Intertidal Zone*

Intertidal areas in the ROI are adjacent to the dry shore, between the high and low tide line, and are subject to varying degrees of tidal submergence. There are several subareas of intertidal habitat based on the influence of tides described in the sections that follow. The intertidal zone is a highly dynamic area because of its variable exposure to air. Plant and wildlife species must adapt to extremes in temperature and dehydration, as well as salinity stress.

##### Southern Coastal Salt Marsh

Southern coastal salt marsh is a higher-elevation intertidal community, characterized and caused by ocean flooding of low-lying areas at high tide. The tide is the most important source of water, nutrients, and oxygen to the salt marsh due to the semiarid climate of the ROI and low annual rainfall (MacDonald et al. 1990). The level of salinity in the water at any point in the salt marsh is directly related to its distance from the ocean, with areas further from the ocean having lower concentrations of salt. Organisms in the salt marsh position themselves according to their level of salt tolerance. Typically high in productivity, salt marshes are important nurseries for many species of marine fish, feeding grounds for birds, and home to a wide variety of invertebrates.




SOURCE: Adapted from DON/POSD 2000

[1] Lower limit of salt marsh is defined by lower limit of cordgrass (*Spartina foliosa*). These tidal elevations are estimated based on salt marshes neighboring those of the San Diego Bay. This is as low as +2.3 ft (0.7 m) MLLW in Mission Bay (Levin et al. unpubl. data). In Tijuana Estuary and Anaheim Bay, lower limits range from +3.5 to +5.25 ft (+1.1 to +1.6 m) MLLW (Zedler et al. 1992; Massay and Zembal 1979).

[2] Mudflat zone derived from lower limit of cordgrass to upper limit of eelgrass (0.0).

[3] In the San Diego Bay, depth of eelgrass varies with regions as follows: south San Diego Bay 0.0 to –7 ft (0.0 to –2 m) MLLW; Central Bay 0.0 to –8 ft (0.0 to –2.4 m) MLLW; North Bay 0.0 to –13 ft (0.0 to –4 m) MLLW. Near the mouth in North Bay, there is a different form (wider blades) that extends down to –18 to –24 ft (–5.5 to –7.3 m).

**Figure 3.7-1: Habitat Defined by Tidal Elevation**

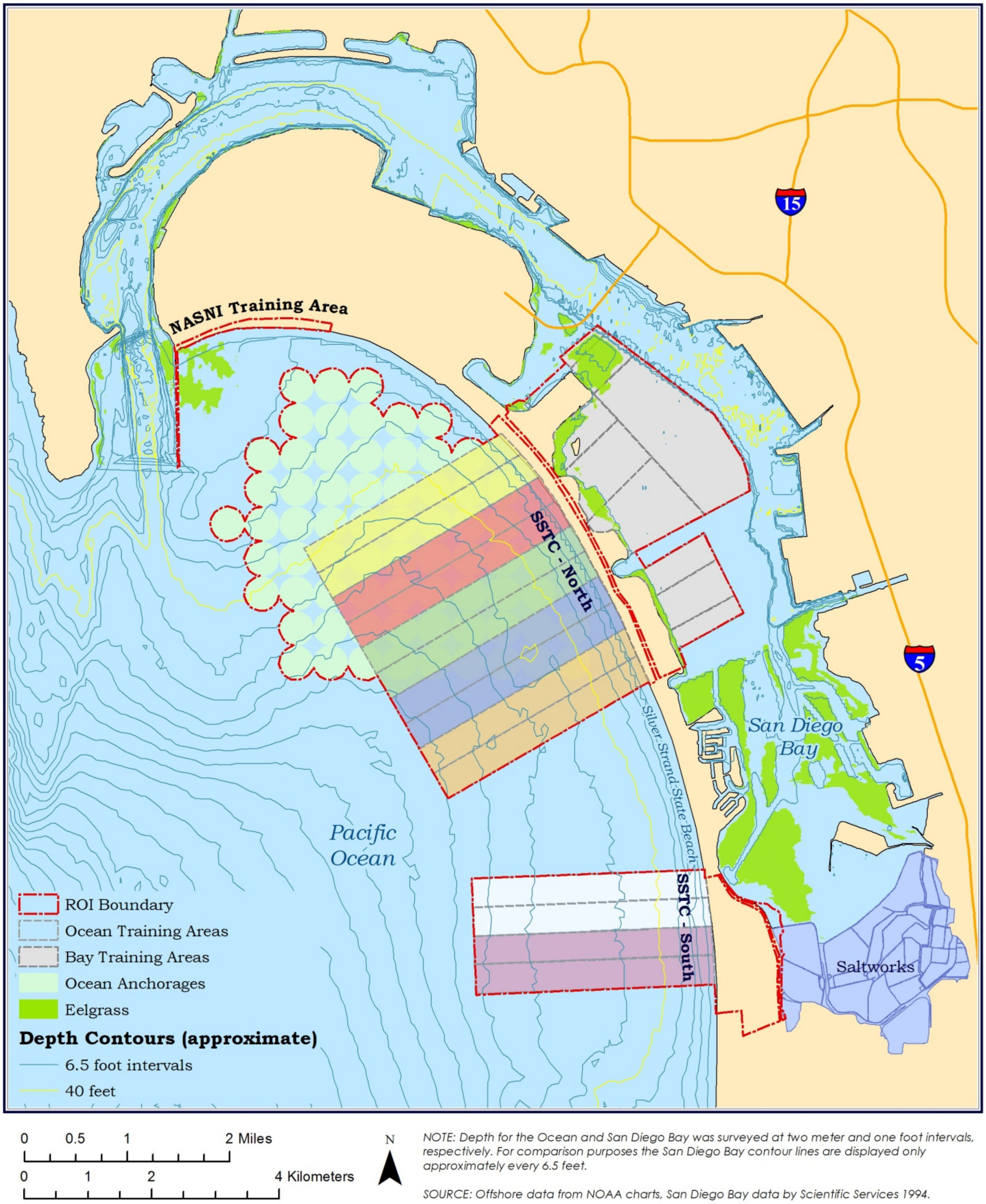



**Figure 3.7-2: Ocean and San Diego Bay Bathymetry in the Vicinity of the ROI**

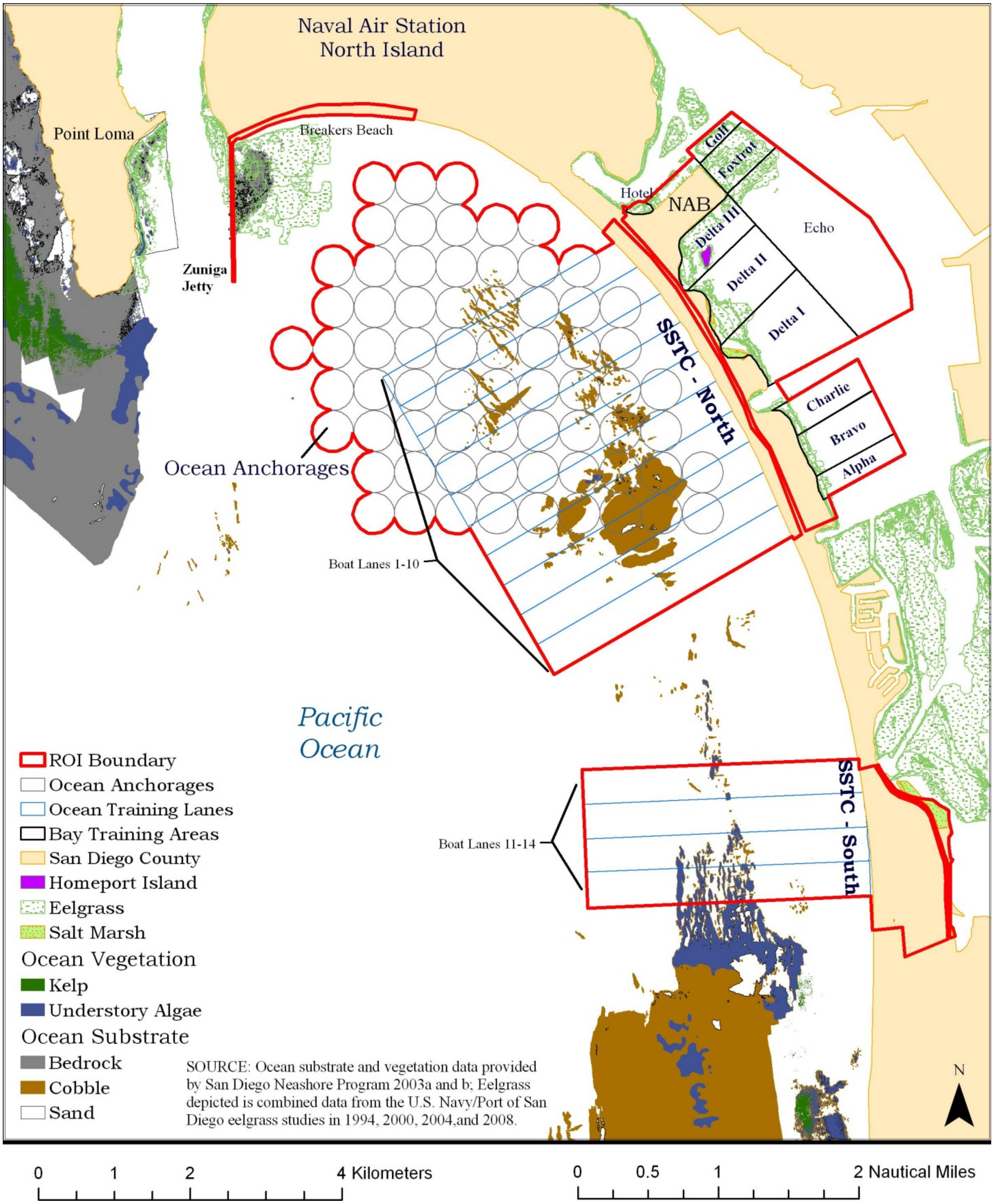



**Figure 3.7-3: Current ROI Vegetation and Substrate Data**

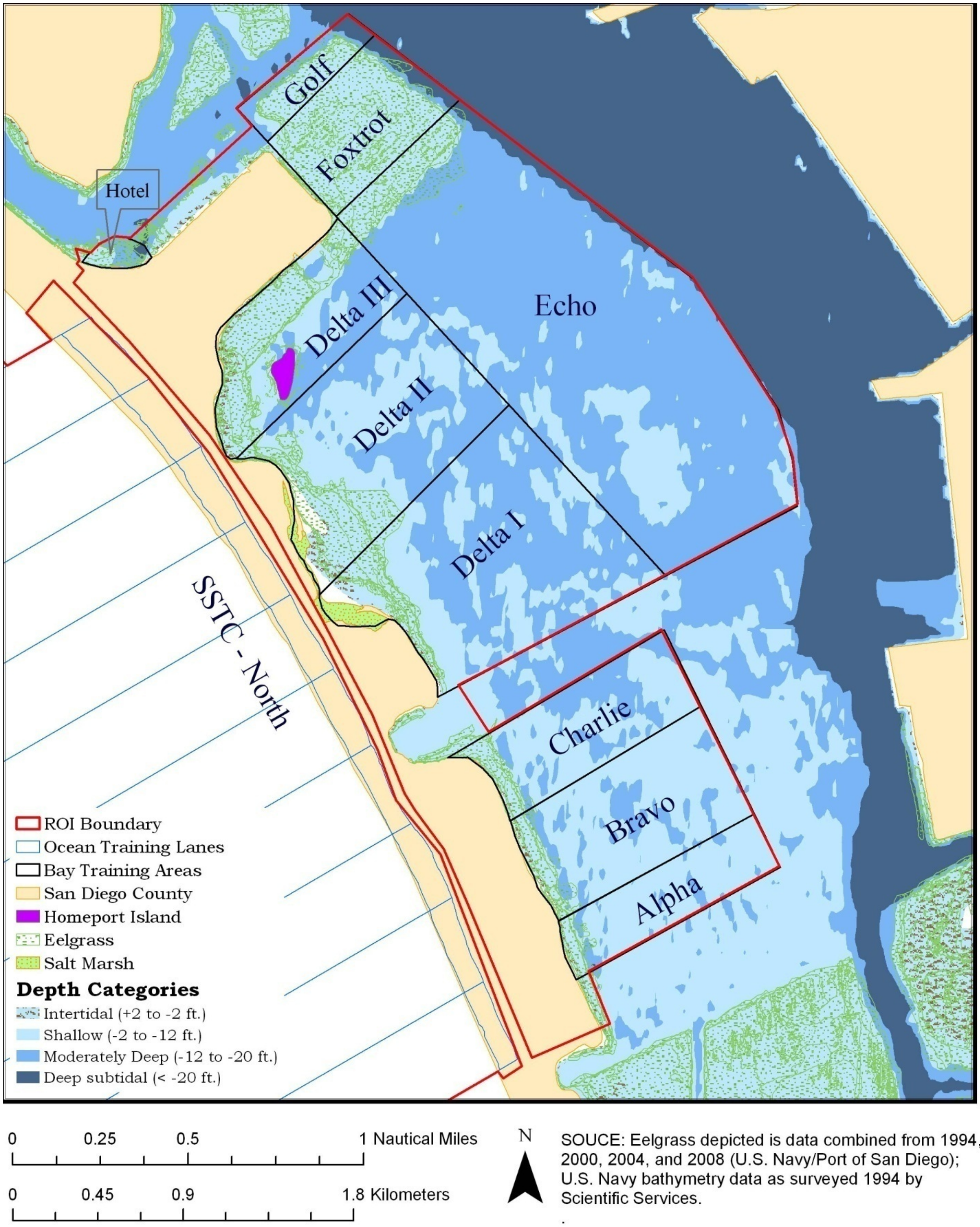



**Figure 3.7-4: Habitat Areas in Bayside Training Areas Broken Down by Depth Category and Whether They Are Vegetated or Unvegetated**

**Table 3.7-1: Total Acres of Submerged Habitat Types within San Diego Bay Based on Bathymetry**

| Depth | Habitat Type | Area Acres |
|---|---|---|
| (> +2.0 feet) | Salt Marsh | 823 |
| (+2 feet to -2 feet) | Intertidal (excluding salt marsh) | 1,802 |
| (> +2.0 feet) | Salt Ponds | 1,608 |
| (-2 feet to -12 feet) | Shallow | 4,799 |
| (-12 feet to -20 feet) | Moderately Deep | 2,219 |
| (< -20 feet) | Deep | 4,443 |
| | **Total** | **15,694 acres** |

Source: Navy-Port eelgrass mapping as surveyed in 2004, and U.S. Navy bathymetry data as surveyed 1994 by Scientific Services

**Table 3.7-2: Area of Submerged Habitat Types Contained within All San Diego Bay ROI Training Areas, and the Proportion (percent) in the SSTC Compared to All San Diego Bay**

| Habitat | Depth | Area Acres | Percent of San Diego Bay |
|---|---|---|---|
| Intertidal | (+2 feet to -2 feet) | 32.37 | 2 |
| Shallow | (-2 feet to -12 feet) | 846.16 | 18 |
| Moderately Deep | (-12 feet to -20 feet) | 982.73 | 44 |
| Deep | (< -20 feet) | 22.27 | 0.5 |

Source: Navy-Port eelgrass mapping as surveyed in 2004, and U.S. Navy bathymetry data as surveyed 1994 by Scientific Services
Note: Approximately 30 acres of open water are owned in fee by the Navy in the ROI (Table 3.11-1).

The pickleweed subtype of salt marsh occurs along the northeast boundary of SSTC-S east of SR-75, at the YMCA Camp Surf, and east of the Wullenweber antennae in the central portion of SSTC. Near San Diego Bay the dominant species are pickleweed (*Salicornia virginica*), alkali heath (*Frankenia salina*), saltwort (*Batis maritima*), woolly seablite (*Suaeda taxifolia*), and saltgrass (*Distichlis spicata*). Internal to SSTC-S, none of the salt marsh is currently subject to tidal influence. The remnant marsh is now isolated from San Diego Bay by roads and salt ponds. The pickleweed series internal to SSTC-S is dominated by alkali heath, saltgrass, glasswort (*Salicornia subterminalis*), and open salt flat areas.

Marine organisms use the areas of salt marsh still exposed to the tide when the tide is in, taking advantage of the abundant food resources. Topsmelt (*Atherinops affinis*), arrow goby (*Clevelandia ios*), California killifish (*Fundulus parvipinnis*), and longjaw mudsucker (*Gillichthys mirabilis*) are all expected in salt marshes, due to their prevalence at the Sweetwater Marsh (Johnson 1999). Young round stingray (*Urobatus halleri*) and California halibut also are expected. Mallard (*Anas platyrhynchos*), gadwall (*A. strapera*), northern harrier (*Circus cyaneus*), black-necked stilt (*Himantopus mexicanus*), American avocet (*Recurvirostra americana*), western meadowlark (*Sturnella neglecta*), and Belding's savannah sparrow (*Passerculus sandwichensis beldingi*) are found, and nest, higher in the marsh (Unitt 2004). The community is also rich in benthic invertebrates (Jacobs 1997). Marsh areas that are no longer exposed to tidal cycles, such as the interior of SSTC-S, are still used by raptors, songbirds, mammals, and other nonaquatic fauna.

### Intertidal Flats

Intertidal flats of San Diego Bay include mudflats, sand flats, and salt flats. They occur between the highest-high and lowest-low tide zones, or otherwise between the lowest cordgrass (beginning of the salt marsh) and highest eelgrass, approximately +3 to 0 feet Mean Lower Low Water (MLLW) in San Diego Bay. This zone normally lacks vegetation. The most extensive intertidal flats in or adjoining SSTC-N and SSTC-S are along the northern shore of the salt ponds, north of the northernmost levee continuing along the bayside boundary of SSTC-S, and off the shore of Delta beaches. Narrow intertidal flats also occur along the margins of tidal channels of the salt marshes of south San Diego Bay such as at SSTC-S and the Delta beaches, and these may be used as feeding areas by the light footed clapper rail and Belding's savannah sparrow. Mudflats have been replaced by fill, concrete bulkheads, and a variety of other stabilization structures in the north San Diego Bay and the eastern shoreline of the central San Diego Bay to provide for recreational, commercial, industrial, and military uses. A well-developed mudflat is anaerobic and stable due to a lack of significant wave action.

When the tide comes in, numerous fish, sharks, and rays move in to forage in the flats. While most mudflat fish are tidal visitors, and some remain at low tide in shallow drainage channels, a short list of species are full-time residents. These are species that can live in the burrows of marine invertebrates (Moyle and Cech 1982). Other fish are seasonal visitors during juvenile life stages: California halibut, California halfbeak (*Hyporhamphus rosae*), and striped mullet (*Mugil cephalus*) (Johnson 1999).

Studies on tidal flats elsewhere have demonstrated that it is frequently only the juvenile decapod crustaceans such as shrimp, as well as demersal fish that forage on tidal flats while the adults and pelagic larvae stay offshore. The tidal flats function as nurseries for the resident juveniles and the subadults, which migrate to the subtidal area to avoid low tide conditions on the flats. While relatively constant salinities and temperatures in offshore waters benefit larval development, these larvae eventually drift onto tidal flats so that the juvenile stages of these fish may take advantage of high temperatures, abundant food, and the absence of large predators (Reise 1985).

When the tide recedes, biodiversity in the mudflat becomes much more visible to even the casual observer. Shorebirds congregate sometimes by the thousands to consume invertebrate prey. Each species specializes in a certain zone, evident by the length of its bill and feeding behaviors that help access the different lifestyles and niches of mud-dwelling species. In the flats that adjoin the salt ponds of south San Diego Bay, the USFWS made 50,000 bird observations of 67 species, primarily seabirds and shorebirds, during year-long, weekly surveys in 1993-1994 (USFWS 1995). More recent year-long monthly shorebird surveys in 2006-2007, in this same area, observed 46,176 total birds including 95 species (Tierra Data 2008).

Sand flats and beaches remain aerobic and typically experience more turbulence from waves, preventing development of permanent burrows. Sandy beaches are more strongly zoned than mudflats (Castro and Huber 1997), because they tend to have a steeper gradient topographically and because coarse grain sizes allow for more rapid and differential drying. The upper beach is drier than the lower beach because water drains away from the upper beach more rapidly. Beach hoppers, sand fleas, and isopods may be expected on the upper beach, whereas polychaetes, clams, and other animals predominate on the lower beach.

### Artificial Hard Substrate

San Diego Bay presently has 45.4 miles of armored shoreline (where man-made, hard structures are used to protect developed sites along San Diego Bay) out of 64.4 total miles of shoreline, or 74 percent of the shoreline. There are also 131 acres of surface structures shading San Diego Bay waters, in both intertidal and subtidal habitats. Protection is needed because unprotected shoreline sites will erode when exposed to tidal fluctuation, storm waves, storm surges, and surface runoff. Pier pilings, bulkheads, rock riprap, floating docks, sea walls, mooring systems, and derelict ships/ship parts form this extensive artificial habitat (i.e., armored shoreline, artificial hard substrate). Artificial hard shoreline occurs along the northernmost bayside areas and along a small area bayside in the northern part of the SSTC-S. These hard structures are used to protect developed sites along the shore and these armored substrates have become habitats for many forms of marine life, including native and nonnative lobster, crabs, worms, mussels, and starfish. These areas may also provide refuge and feeding areas for certain juvenile and predator fish, such as perches, basses, dogfish, opaleye, and croaker. A hardened shoreline typically produces a very steep shore profile that can provide elevated roosting sites for San Diego Bay waterbirds to conserve energy and avoid harsh weather conditions (Ogden 1995). However, these structures with very steep slopes or riprap in which the niches have been filled with concrete provide very poor quality habitat. Different types of artificial hard substrate will support different abundances and types of marine organisms. The surface roughness and complexity of a structure can affect its ability to provide refuge niches and allow retention of water at low tides. Seawalls provide the poorest habitat for marine species, as their relatively smooth surfaces and vertical angles reduce suitable areas for attachment.

### *Salt Pond*

Salt ponds are large, persistent, saline impoundments of estuarine, ocean, and San Diego Bay water that are currently, or have been, managed primarily for salt production. A portion of the salt pond complex is owned by the Navy at the northeast corner of SSTC-S, and it is managed in cooperation with USFWS – Refuges. This area is rich in shorebirds due to the abundance of invertebrate forage, and is also used by nesting seabirds (on the dikes). Gulls, terns, black skimmers (*Rynchops niger niger*), and pelicans, including the California brown pelican (*Pelecanus occidentalis californicus*), use the dikes for evening roosts. Dikes separating the ponds support significant nesting colonies of western snowy plover (*Charadrius alexandrinus nivosus*), Belding's savannah sparrow, black-necked stilt (*Himantopus mexicanus mexicanus*), black skimmer, and Caspian, Forster's, gull-billed, royal, and California least terns (*Sterna* sp.). One of only two nesting colonies of elegant terns (*Sterna elegan*s) in the United States can be found at the salt ponds.

### *Shallow Subtidal*

Continually submerged, these shallow habitats extend from the low tide zone (-2.2 to -12 feet MLLW) and can either be vegetated or unvegetated. Shallow soft-bottom areas, with their associated fauna and flora, were the primary subtidal habitat in San Diego Bay prior to its development. The shallow subtidal habitat can be found across 3,734 acres (28 percent) of the south San Diego Bay, portions of south-central San Diego Bay, and narrow strips along the shoreline of north and north-central San Diego Bay. This habitat makes up about half of the in-water bayside training areas of SSTC-N, and connects with the northeastern tip bayside in SSTC-S. Sediment grain sizes tend to be very coarse (0 to 5 percent fines) to coarse (5 to 25 percent fines). The abundance and biomass of organisms is much higher in shallow waters, including invertebrates (Ranasinghe et al. 2007), fish (Allen 1999, Pondella et al. 2006) and bird abundance and diversity (Ogden 1994, USFWS 1995, Tierra Data 2008). Shallow waters support many thousands of resident and migratory birds every year for foraging and resting. The bird groups that appear to use these areas preferentially are bottom-feeding divers such as surf scoter and scaup (*Aythya affinis* and *A. marila nearctica*), dabbling brant, plunge divers such as terns, and the surface-foraging black skimmer (Ogden 1994, USFWS 1994).

## Unvegetated Shallow Soft Bottom

Soft bottoms of unconsolidated sediment are unstable and shift in response to tides, wind, waves, currents, human activity, or biological activity such as bottom fish feeding, or bat rays (*Myliobatis californica*) excavating pits to reach buried clams. Few plants and animals have adapted to this instability. Because animals and plants lack attachment sites in this environment, they must burrow into the substrate to prevent from being washed away by currents, and so are called "infauna." Competition for space is ameliorated partly by organisms occupying various depths within the substrate. Invertebrates such as sponges, gastropod mollusks, and some larger crustaceans and tunicates live on the surface.

An important structural component of unvegetated shallows is the presence of extensive masses or mats of living algal material interspersed with areas of exposed sediment that may extend into the intertidal zone (Ford 1968, Ford and Chambers 1974). The dense, heavily branched red alga (*Gracilaria verrucosa*) forms the bulk of this mat, which also includes other red algae (i.e., *Hypnea valentiae* and *Griffithsia pacifica*). Some of these mats are loosely anchored in the sediment, while others drift just above the bottom. Mats can be one to two feet thick during the warmest months of the year. Underwater observations indicate that these algal mats are an important microhabitat feature, because they provide cover or refuge from predators for many species of motile invertebrates and fish, much like marsh vegetation does for birds. The algae also appear to serve as a food source for some invertebrates. The living plant material and detritus constitute a primary food source for California killifish and other fish, crabs, isopods, gastropod mollusks, and some aquatic birds (MacDonald et al. 1990).

Unvegetated shallows support species assemblages of benthic invertebrates and demersal fish that are distinct from vegetated shallows (Kramer 1990, Takahashi 1992a, Allen 1997). Many of these invertebrates serve as food sources for the demersal fish that are restricted to or occur primarily in these unvegetated shallow areas of soft sediment. An example is the California halibut, a flatfish species of commercial and recreational value. The small juvenile halibut is restricted primarily to unvegetated shallows of unconsolidated sediment in bays and estuaries (Allen 1982, Kramer 1990), where they feed on invertebrate fauna (Drawbridge 1990). Unvegetated shallows therefore provide a key nursery for halibut.

## Vegetated Shallow Soft Bottom

Eelgrass (*Zostera marina*), a native marine angiopserm, provides a key benthic habitat in San Diego Bay. Eelgrass habitats rank among the most productive habitats in the ocean (Nybakken 1997). As has occurred in bays and estuaries all along the Pacific coast and elsewhere in the world, eelgrass beds in San Diego Bay have suffered substantial loss due to their location in sheltered waters where human activity is concentrated. They are currently located in patches along the bayside shore of SSTC-N and SSTC-S (Figure 3.7-5). In San Diego Bay, these beds extend from 0 feet MLLW to depths of approximately -23 feet MLLW, depending on levels of light and water turbidity. In south San Diego Bay the range is from 0 to -7 feet MLLW, central San Diego Bay zero to -10 feet MLLW, and north San Diego Bay 0 to -13 feet MLLW. Near the mouth in north San Diego Bay, a different variant of eelgrass (wider blades) grows from -16 to -23 feet MLLW (Hoffman 2001). Table 3.7-3 presents the acreages of eelgrass present in Navy bayside training lanes. Two hundred and forty-eight acres of eelgrass are present with all the bayside training lanes representing approximately 13% of the total bayside training area.

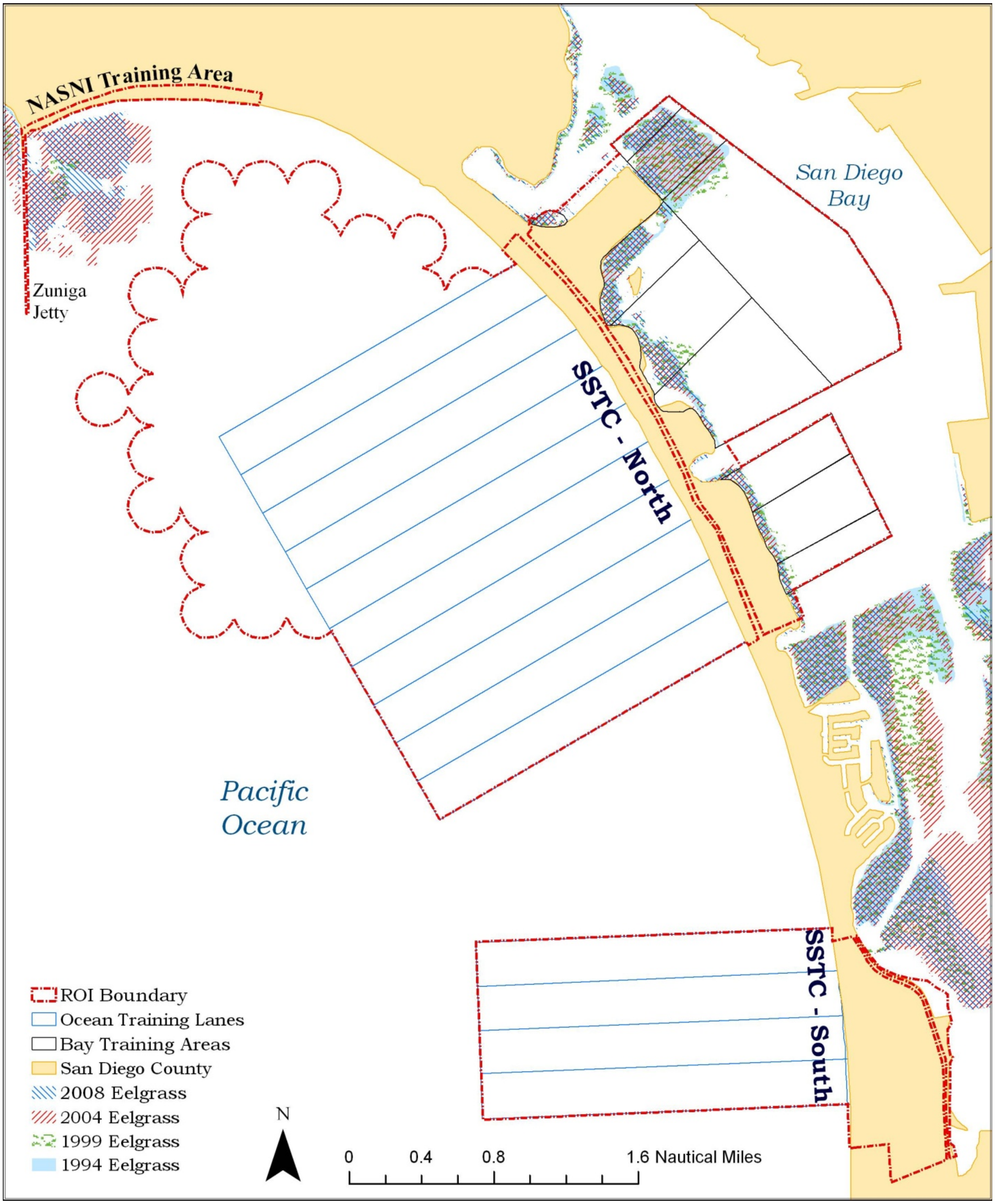



**Figure 3.7-5: Distribution of Eelgrass in and Around the SSTC ROI in Four Separate Survey Years**

**Table 3.7-3: Eelgrass Areas of the SSTC ROI and Individual San Diego Bay Training Areas**

| Bayside Training Area | Square Kilometers | Acres |
|---|---|---|
| Alpha | 0.0354 | 8.7 |
| Bravo | 0.0710 | 17.5 |
| Charlie | 0.0550 | 13.6 |
| Delta-I | 0.0940 | 23.2 |
| Delta-II | 0.2077 | 51.3 |
| Delta-III | 0.2616 | 64.7 |
| Echo | 0.1833 | 45.3 |
| Foxtrot | 0.4206 | 103.9 |
| Golf | 0.1108 | 27.4 |
| Hotel | 0.0342 | 8.5 |
| **Total** | **1.4736** | **364.1** |

Source: Composite data from 1994, 1999, 2004, and 2008 baywide eelgrass surveys.

Eelgrass beds are an important component of the San Diego Bay food web. Much of its productivity enters the food web as detritus or decayed material consumed by invertebrates. Fishes and invertebrates, such as juvenile lobster, use eelgrass beds to escape from predators, as a food source, and as a nursery. Fish documented to use eelgrass beds include topsmelt, guitarfish, diamond turbot, bat ray, dwarf perch, arrow goby, jack mackerel, pipefish, Pacific sardine, striped mullet, and walleye surfperch (Department of the Navy [DoN] 2000). The plants provide surfaces for egg attachment and sheltered locations for juveniles to hide and feed. Fish produced from these beds are consumed by fish-eating birds, including the endangered California least tern. Waterfowl, especially surf scoter, scaup, and brant are present in high numbers in late fall and winter in eelgrass beds.

Eelgrass beds are the most productive areas on the soft bottom. Roots and rhizomes help stabilize the unconsolidated substrate by forming an interlocking matrix that inhibits erosion. The plants themselves keep water clearer by trapping fine sediments and preventing their resuspension (Takahashi 1992b). Leaves cut down wave action and currents; the resulting decrease in turbulence causes more fine sediment to be deposited. Abundant algae and invertebrates that grow on the leaf blades provide primary and secondary productivity for consumption by larval and juvenile fish. Sediments within eelgrass beds are loaded with detrital leaves, rhizomes, and nutrients that fuel infaunal invertebrates. When epibenthic invertebrate abundances are low, this indicates impaired food chain support functions (Rutherford 1989).

### *Moderately Deep Subtidal*

Moderately deep subtidal habitat, defined as water depth ranging from -12 to -20 feet MLLW, covers approximately 2,219 acres or 17 percent of San Diego Bay, and occurs primarily off the coast of SSTC-N and in inlets of north San Diego Bay. Of this, 887 acres or 44 percent is in the ROI. Moderately deep subtidal is by far the majority of San Diego Bay marine habitat in the ROI. It extends from the approximate lower depth of most eelgrass beds to the approximate edge of the shipping channel. It represents areas that generally have been dredged in the past, but are not maintained as navigational channels. The most recent dredging record at these depths off of SSTC-N occurred from 1941 to 1945, and sediments vary widely in this region, from 5 to 95 percent fines.

The moderately deep south San Diego Bay region is dominated by round stingray, spotted sand bass (*Paralabrax maculatofasciatus*), California halibut, slough anchovy, and barred sand bass (*P. nebulifer*) (Allen 1998, Pondella et al. 2006). Moderately deep water is used in higher numbers, compared to other San Diego Bay locations, for resting by bottom feeding diving birds, especially rafting surf scoter, scaup, bufflehead (*Bucephala albeola*), and plunge divers, such as terns and brown pelicans (Ogden 1995, USFWS 1995). The federally endangered California least tern and brown pelican forage in these areas. While these depths generally do not support eelgrass in this part of San Diego Bay, the substrate may be covered with turf algae or marine invertebrates such as sea pens. Sea pens are colonial marine cnidarians belonging to the order Pennatulacea.

#### *Deep Subtidal*

Deep subtidal habitat includes the surface water, water column, and sediments for areas greater than -20 feet MLLW. It is associated primarily with navigational channels. Except for a few areas in north San Diego Bay that have no dredging record, all deep subtidal habitat has been dredged since the 1940s; most was dredged in the 1960s or more recently. Since very little of this habitat occurs in the ROI, it is not discussed further.

### Habitats of the Nearshore Ocean and Surf Zone

This habitat includes the area offshore, or the oceanside of SSTC-N and SSTC-S, and includes the marine waters off of the sandy beaches of NASNI, SSTC-N (the yellow through orange boat lanes), and SSTC-S (including the white and purple boat lanes). Also included are the ocean anchorages that partially overlap the SSTC-N ocean boat lanes.

Habitats on the oceanside of the SSTC can be described by a combination of depth, substrate, and wave energy. The nearshore area is primarily soft bottom, and spans from exposed sandy beaches to the water column above the inner shelf. The coastal nearshore areas are classified as surf zone and coastal pelagic zone up to 100 miles westward as described by Allen et al. (2006) and others. The high-energy surf zone and shallow (< 98 feet MLLW) areas dominated by sand and low-lying (<7 feet MLLW) rocky reef and cobble are typical of much of the southern California coastline, and are illustrated in Figure 3.7-6. Utilizing the habitat classification system developed for SANDAG and California Coastal Conservancy (Merkel & Associates, Inc. et al. 2002), the majority of the area is described as a Subtidal/Soft Bottom/Sand ecotype, with a low to moderate energy ecotype modifier, due to seasonal variability with respect to wave energy.

The offshore area also includes portions classified as Subtidal/Hard Bottom/Cobble/Understory algae and adjacent habitat within the ROI as Subtidal/Hard Bottom/Boulder/Rock Reef/Kelp Bed ecotypes (the latter associated with Point Loma). The algal communities such as kelp beds add structure in shallow water, fostering a richer species assemblage. The basic habitat data for nearshore ocean areas is provided by the San Diego Nearshore Program, as reported from surveys in 2002. Figure 3.7-6 and Figure 3.7-7 show the habitat of the nearshore area in the northern and southern portions of the ROI, respectively. Tables 3.7-4 and 3.7-5 quantify the corresponding habitat areas. This program uses a habitat classification system that integrates elements from a number of previously created classification systems, including the Marine and Estuarine Ecosystem and Habitat Classification developed by National Oceanic and Atmospheric Administration (NOAA) (Allee et al. 2000). The Nearshore Program is a cooperative effort of the NOAA-National Marine Fisheries Service (NMFS), California Department of Fish and Game (CDFG), USFWS, and United States Army Corps of Engineers (USACE), among others.

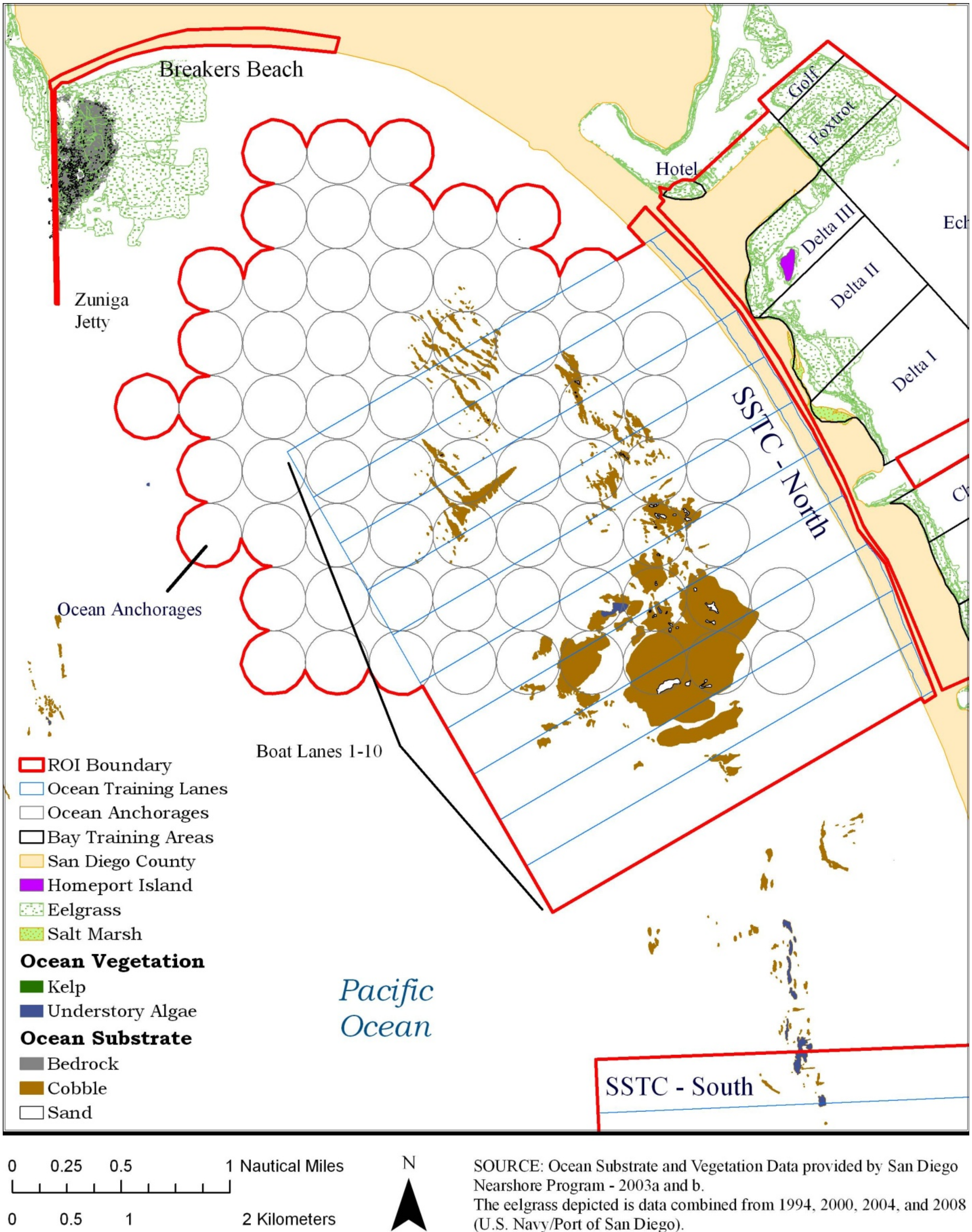



**Figure 3.7-6: Nearshore Vegetation and Substrate Data for the Northern Boat Lanes**

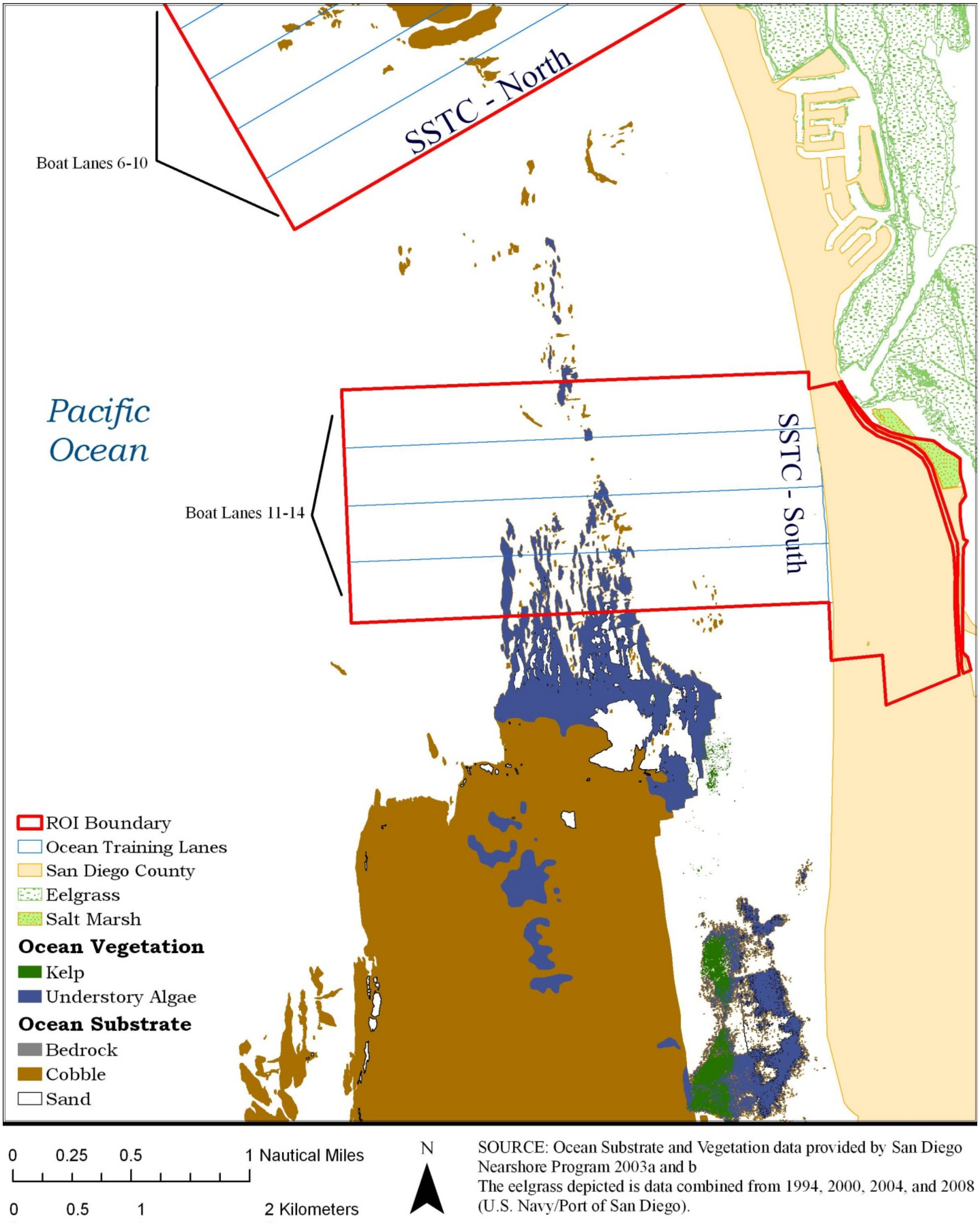



**Figure 3.7-7: Nearshore Vegetation and Substrate Data for the Southern Boat Lanes**

**Table 3.7-4: Substrate Type Contained within Oceanside SSTC ROI Boat Training Lanes and Anchorages (see associated Figures 3.7-6 and 3.7-7)**

| Training Area | Substrate Type | Square Kilometers | Acres |
|---|---|---|---|
| SSTC-N Oceanside Lanes | Sand | 16.0 | 3,956 |
| | Cobble | 1.72 | 424 |
| | Boulder | 0 | 0 |
| | **Total** | **17.7** | **4,379** |
| SSTC-S Oceanside Lanes | Sand | 8.34 | 2,062 |
| | Cobble | 0.44 | 108 |
| | Boulder | 0 | 0 |
| | **Total** | **8.78** | **2,170** |

Note: Substrate data provided by San Diego Nearshore Program – 2002

**Table 3.7-5: Area of Vegetated Substrate Contained within Oceanside SSTC ROI Boat Training Lanes and Anchorages (see associated Figures 3.7-6 and 3.7-7)**

| Operational Area | Vegetation Type | Square Kilometers | Acres |
|---|---|---|---|
| SSTC-N Oceanside Lanes | Surfgrass/Eelgrass | 0 | 0 |
| | Understory Algae | 0.013 | 3.26 |
| | Kelp/Macroalgae | 0 | 0 |
| SSTC-S Oceanside Lanes | Surfgrass/Eelgrass | 0 | 0.00 |
| | Understory Algae | 0.42 | 103 |
| | Kelp/Macroalgae | 0 | 0 |

Note: Vegetated substrate data provided by San Diego Nearshore Program - 2002

The area near SSTC-N has a southwest exposure, while the SSTC-S and Imperial Beach area, just four miles to the south, has a west exposure. A survey conducted that encompassed portions of the area containing existing U.S. Navy anchorages and boat lanes on the oceanside of the Silver Strand confirmed that SSTC-N is composed of nearly 100 percent sand (Tierra Data Inc. 2006). Anomalies in the sonar transects in several areas were found to be sand ridges or waves composed of primarily coarse sand and shell fragments; this is indicative of areas of focused wave energy from wave refraction. The northern area is classified as having low to moderate wave energy due to its seasonal variability with respect to wave energy.

Towards SSTC-S and Imperial Beach, substrate type and relief were more variable. While the bottom contained primarily sand (90 percent), similar to offshore of SSTC-N, video imagery displayed a physically disturbed site where sand movement and large storms scour the bottom on a seasonal basis. This scoured area continues offshore at least 3,281 feet. Substrate and associated communities fluctuated frequently, without relation to depth, and contained hard bottom with boulders, rock reef, potential kelp bed habitat, and cobbly understory algae habitat subtype. This area is considered to be high energy for waves and unstable. Giant kelp (*Macrocystis* spp.) is highly variable from year to year and the development of perennial kelp forest habitat requires substrate and conditions not found within the SSTC-N or SSTC-S oceanside training lanes.

The proportion of hard substrate habitat at any given time relates to the amount of sand in the littoral cell and relief height. These substrate qualities include relief height (low, high), texture (smooth, pitted, cracked), size, and composition (sandstone, mudstone, basalt, granite). Substrates that are of higher relief, greater texture, and greater size generally have the richest assemblages of marine species. Cobbles, which roll and move about within the wash zone can prevent marine life from establishing. Rocks and reefs of low height are subjected to seasonal burial and uncovering associated with the onshore and offshore migration of sand. Such low-lying substrate tends to contain less biodiversity and be dominated by opportunistic annual turf vegetation or sand-tolerant species. The boulder and cobble areas observed off SSTC-N and SSTC-S have low to moderate densities of attached algae including various red algae, giant kelp (*Macrocsytis pyrifera*), and encrusted coralline algae.

Moving further offshore to depths where seasonal sand movement is less, hard substrates do not need to have as high a relief to support perennial species. Kelp beds are an important habitat associated with offshore reefs; however, kelp beds observed in the ROI are ephemeral and not persistent. Giant kelp is one of the first species to be eliminated in physically stressed habitats (wave or sand scour). El Niño conditions, which result in higher than average temperatures and low nutrients, have been linked to periodic and widespread reductions in kelp canopy. The kelp community, dominated by giant kelp, ranges from water depths of about -20 to -120 feet MLLW It is a unique habitat that provides food, shelter, substrate, and nursery areas for many species of fish and invertebrates.

An important function of the nearshore environment is the transport of plankton into and out of San Diego Bay for coastal species that depend on access to the warm, sheltered, shallow waters during early life cycle stages. Within the water column are microscopic species of phytoplankton and zooplankton, including the larvae of many fish and crustaceans. The movement and distribution of plankton is completely dependent on currents and tides. Phytoplankton are an important primary producer in all areas of the ROI Feeding on phytoplankton and with a potentially completely different seasonal cycle are zooplankton, including abundant meroplankton or “temporary plankton,” the larval forms of invertebrates that later settle to the bottom and become benthic juveniles and adults. These forms occur together with species called holoplankton, which are zooplankton that spend their entire lives in the open water environment in planktonic form. The density and diversity of holoplankton are greater in the nearshore ocean and north San Diego Bay, which is closer to coastal ocean water (Ford 1968). Some zooplankton migrate vertically through the water column from day to night, as well as horizontally with tidal movement.

Because of their importance and distinctive mode of life, planktonic larvae of fish are considered a separate category of plankton called ichthyoplankton. The California Cooperative Oceanic Fisheries Investigations (CalCOFI) unit has conducted standardized ichthyoplankton surveys, primarily offshore of California and Baja California, since 1951. Survey methods and results are described by Moser et al. (1993). Geographic Information System maps of egg and larval distributions of managed species have been developed from data collected during these surveys (PFMC 1998c and 2003).

#### 3.7.1.3.2 Marine Plants and Invertebrate Community Overview

This section describes the marine plant (including marine algae) and invertebrate communities as a resource in the nearshore and offshore areas of the SSTC, and portions of the ROI in San Diego Bay, for the purpose of comparing the environmental consequences of the Proposed Action and the alternatives. This includes the water and physical substrate in the benthic environment that support plankton, algae, plants, and invertebrates. Representative biological communities comprised of characteristic plant, algae and invertebrate species exist within habitats that are typically defined by depth, substrate, temperature and tidal exposure. The surf wash line that contains beach wrack left by high tides is considered the beginning of terrestrial habitat and is discussed in that section. The intertidal zone on the surf side extends to about -6 feet MLLW which is similar to its lowest elevation in mudflats on the San Diego Bay side of the SSTC. The intertidal zone also includes artificial structures as habitat, such as piers, docks, and riprap. Salt marsh plants and vegetation are treated as a terrestrial biological resource in this document. Fisheries for macroinvertebrates such as sea urchins and lobsters are briefly described in this section.

### Marine Algal Community

The ecological contribution and diversity macroalgae (seaweeds) is substantial in San Diego Bay, where over 50 species have been documented. They are the principal producers in the ecosystem and provide an important food source. Additional structure is also imparted by larger algal species and eelgrass. Additionally, an important food resource for zooplankton and filter-feeders is provided by the many algal species that reproduce with swimming gametes and zoospores to enhance their dispersal.

Algal species are found in association with a wide range of habitats. In some cases, these associations are strongly tied to physical substrate. Some algae are found on sandy substrate, and many that grow subtidally on rocky substrate are also found on hard intertidal surfaces. In other cases, the relationship seems to be opportunistic—any or all are commonly found in a given habitat.

In San Diego Bay, macroalgae belong to three different taxonomic groups or Phyla: Chlorophyta (green algae), Phaeophyta (brown algae), and Rhodophyta (red algae). The differences among the phyla primarily relate to photosynthetic pigments, certain physiological processes, and reproductive/life history characteristics. Macroalgae differ primarily by photosynthetic pigments, physiological processes, and reproductive/life history characteristics.

Chlorophyta—Nine species of green algae can be found in San Diego Bay: *Cladophora* sp. *Ceramium eatonianum, Eryopsis corticulans, Derbesia marina, Chaetomorpha linum, Ulothrix* sp. (woolly hair), *Enteromorpha* sp., *Ulva expansa* (sea lettuce), and *Ulva tacnista*.

Phaeophyta—There are 12 native species of brown algae that are consistently found in San Diego Bay: *Egregia laevigaia, Eisenia arborea, Undaria pinnatifida, Porphyra perforta, Dictyota flabellate, Ectocarpus* spp., *Fucaceae* sp., *Sargassum agarhianum, Sargassum muticum, Sargassum palmeri, Colpomenia sinuosa, Endarachne binghamiae*, and *Scytosiphon lomentaria*.

Rhodophyta—The largest group of algae, represented by 25 species, is the red algae: *Gigartina tepida* (turkish towel), *Tiffaniella snyderae, Polysiphonia pacifica, and Hypnea valentiae,* shallow water: *Antithamnion sp. and Polysiphonia pacifica,* and *Aglaothamnion cordatum.* Many species of red algae are quite small and may be present only cryptically attached to a variety of structures or as epiphytes, living atop another plant or algal form.

Typically found in San Diego Bay's shallow subtidal areas are the green algae *Chaetomorpha linum, Cladophora* sp., *Enteromorpha* sp., and *Ulva expansa* (sea lettuce); the brown algae *Sargassum palmeri;* and the red algae *Gigartina tepida, Gelidium nudifrons, Gigartina sp., Gracilaria lemaneiformis Hypnea valentiae,* and *Tiffaniella snyderae.*

Mudflat areas may be covered with algae, such as the red algae *Sarcodiotheca gaudichaudii* and *Antithamnion* sp. Toward the uppermost elevations, green algae such as *Enteromorpha* sp., *Cladophora* sp. and *Ulva* spp. can form extensive mats (Mudie 1970). Burrows and siphon-holes of benthic invertebrates, tiny invertebrates that live among the grains of substrate (meiofauna), and algae and detritus fill the sediment with hidden activity, and are all necessary to support the food chain and mineral cycles of San Diego Bay. Snails, crabs, and polychaete worms (deposit feeders) glean the surface for detrital bits and algae. Filter-feeders such as clams, mussels, and small crustacean isopods and amphipods collect plankton, algae, and detritus as they wash by when the tide is in. The deposit feeders and filter feeders together are extremely efficient processors of the living and dead plankton.

In the salt marsh, the productivity for epibenthic algae underneath the open canopy is high compared to salt marshes outside of southern California (Zedler 1992). Annual productivity of dense algal mats beneath the marsh canopy could match or exceed that of vascular plants in local marshes. Rudnicki (1986) found the maximum volume of macroalgae where circulation was reduced and where prevailing winds moved the floating mats.

### Eelgrass Community

Eelgrass has an extremely rapid growth rate, high net productivity, and a very high level of biomass (McRoy and McMillan 1977). Its importance as habitat is evident from the great diversity of both its associated invertebrate and fish faunas (Phillips 1984, Hoffman 1986, Takahashi 1992a). In the course of a five-year study (1997-2002) which compared fish abundances at a Navy eelgrass mitigation site in the north bay among introduced reef enhancement structures, the eelgrass mitigation planting, an established eelgrass site, and Zuniga Jetty, several species of fish were found in eelgrass beds after 44 visits and 1,056 transects sampled (Pondella 2006). These were topsmelt, guitarfish, diamond turbot, bat ray, dwarf perch, arrow goby, jack mackerel, pipefish, Pacific sardine, striped mullet, and walleye surfperch. Vantuna Research Group (2006) suggested that, baywide, eelgrass provides valuable habitat for several important species in San Diego Bay: kelp bass, kelpfish, barred sand bass, and California halibut use eelgrass primarily as juveniles, while spotted sand bass and shiner perch are present in eelgrass throughout their life cycles.

Because of its physical structure, eelgrass beds provide microhabitats for a wide variety of invertebrates and small fish, primarily by increasing the available substrate surface and by providing effective shelter. Phillips (1984) and Takahashi (1992a) reported the following four functional groupings of animals living within eelgrass beds in San Diego Bay:

1. Epifauna living on the eelgrass blades and using them as a substrate for attachment.
2. Epifauna living on the surface of the sediment, sometimes also moving onto the eelgrass blades.
3. Infauna living in the sediment of the bed, with some of these moving onto the blades during the eelgrass growing season.
4. Invertebrates and fish living in or above the eelgrass canopy. This last group involves animals that move easily in and out of the bed at different times of day or on a seasonal basis.

The distribution and abundance of eelgrass in San Diego Bay have changed significantly over time, declining and improving along with the water quality condition in San Diego Bay (Ford and Chambers 1974, Lockheed 1979, Hoffman 1986). The density and biomass of eelgrass beds in San Diego Bay and elsewhere also vary widely from one season to another (Marsh 1973, Takahashi 1992b). The main factors responsible appear to be depth, sediment grain size distribution, nutrients, light levels, temperature, and salinity (Phillips and Lewis 1984). Black brant (*Branta bernicla nigricans*), a goose that uses eelgrass as its predominant food, has been an indicator of eelgrass abundance in San Diego Bay since the 1880s. Reports of 50,000 to 100,000 brant in Spanish Bight alone (an inlet between Coronado and North Island that was filled in 1941) suggest abundant eelgrass beds during that period. In 1941 there were reports of the complete loss of all eelgrass, reaching a low point in the late 1950s and early 1960s. Brant abundance in 1942 totaled 1,100 individuals for the entire San Diego Bay (USFWS 1995). Since the elimination of sewage deposition into San Diego Bay waters in 1963, eelgrass appears to grow naturally or as a result of revegetation throughout San Diego Bay wherever it can grow. Shallow subtidal areas that remain unvegetated may remain so due to turbidity, high temperature, or unknown reasons.

## Marine Invertebrate Community

This section describes the marine invertebrates of the ROI, primarily epifauna (animals that live upon the surface of sediments) and infauna (animals that live buried in the substrate such as in burrows) of sediments of the ocean floor. These animals are extremely abundant, especially in San Diego Bay. The major intertidal and subtidal habitats of the SSTC together support more than 650 documented species of marine, estuarine, and salt marsh invertebrates (DoN 2000). These include marine representatives of all the major invertebrate phyla (as well as insects and spiders important as components of the salt marsh community). In addition to the large number of invertebrate species and their taxonomic and functional diversity, many invertebrate populations are represented in the nearshore ocean environment, and are abundant in San Diego Bay. All of these characteristics make them important ecological components of SSTC habitats and essential food sources for marine fish, birds, and other invertebrate animals in those habitats.

Organisms that live in the benthos have a patchy distribution due to changes in sediment particle size on the floor of San Diego Bay or the ocean and changes to their own reproduction and dispersal mechanisms, which have a clumped pattern. Despite this spatial variability, the type and abundance of invertebrates present within various regions of San Diego Bay and in nearshore ocean waters of the SSTC remain dominated by infaunal invertebrates inhabiting soft-bottom sediments. These include polychaete worms, crustaceans, molluscs, and species of oligochaete and nematode worms (Kinnetic Laboratories Inc. 1990). The availability of differing substrate types within each subregion shapes the associated invertebrate community and in turn the fish assemblages preying upon them. Important regional data on benthic invertebrates has been collected continuously since 1951 (CalCOFI) and provides a baseline of documented species. San Diego Bay specific surveys have largely been limited to studies investigating for development impacts or mitigation studies and lack a comprehensive evaluation of all substrate types and values. However, the recent effort at a more comprehensive, region-wide sampling has started to improve the availability of data. During the Southern California Bight 1998 Regional Monitoring Project (Bight '98, Bay et al. 2000), the Southern California Coastal Water Research Project collected a total of 1,172 megabenthic invertebrates, representing 43 taxa, in San Diego Bay. The nonindigenous bivalve *Musculista senhousia* was present in more than 70 percent of the samples, making it the most widely distributed trawl-caught invertebrate in San Diego Bay. Other common invertebrates that were present in at least one third of the samples included two undescribed species of sponge, *Porifiera* sp SD4 and *Porifera* sp SD5, the ascidian *Microcosmus squamiger,* the bivalve *Argopecten ventricosus,* and the gastropod *Crepidula onyx. Musculista senhousia* together with another nonindigenous species, *Microcosmus squamiger,* accounted for over 50 percent of the total catch.

Benthic sediments in the nearshore ocean and San Diego Bay were sampled for infaunal invertebrate abundance, with results summarized by major taxonomic groups detailed in Table 3.7-6 (Ranasinghe et al. 2007).

### *Soft Bottom, Unconsolidated Sediment*

The subtidal bottom of the SSTC consists primarily of unconsolidated sediments. These include various grain size mixtures of sand, silt, and clay, depending on the degree of water movement and other environmental factors. The silt and clay fractions together are also classified in a more general way as the mud fraction. Portions of the ROI shoreline of south San Diego Bay, and along the western shoreline of central San Diego Bay, have relatively extensive intertidal areas of unconsolidated sediment forming mudflats and sand flats. With some notable exceptions, these relatively natural intertidal flats are absent from the remainder of San Diego Bay, where they have been replaced by concrete bulkheads and a wide variety of other man-made structures.

**Table 3.7-6: Infaunal Invertebrate Abundance Sampled during the Bight '03 Survey**

| General Location | Sampling Station | Infaunal Abundance | | | | |
|---|---|---|---|---|---|---|
| | | Crustaceans | Molluscs | Polychaetes | Other | Total |
| San Diego Bay | Old San Diego River Mouth | 3 | 1 | 1 | 1 | **6** |
| | Convair Lagoon | 147 | 20 | 528 | 139 | **834** |
| | Glorietta Bay | 37 | 158 | 628 | 19 | **842** |
| | Central Bay | 306 | 274 | 1647 | 101 | **2328** |
| | Delta South | 148 | 462 | 492 | 183 | **1285** |
| | Sweetwater Channel | 56 | 83 | 813 | 97 | **1049** |
| | Coronado Cays | 49 | 73 | 351 | 340 | **813** |
| Ocean | Nearshore SSTC-S | 50 | 38 | 78 | 24 | **190** |
| | Offshore SSTC-N | 47 | 5 | 107 | 7 | **166** |
| | Offshore Imperial Beach | 30 | 10 | 76 | 14 | **130** |

Note: Samples were collected using a 0.1$m^2$ modified Van Veen Grab

Unconsolidated sediment or soft bottom habitats in the intertidal and subtidal areas of San Diego Bay are fairly unstable, and very unstable in the ocean waters. To avoid being carried away, infauna burrow into the substrate, as well as use the substrate for food and protection from predators. They can be disturbed easily by human activity, wind, waves, tidal currents, and feeding by bottom fish and shorebirds. Relatively few species form part of the epifauna, which are invertebrates such as sponges, gastropod molluscs, and some larger crustaceans and tunicates that spend all or most of their time on the sediment surface.

Deposit feeders predominate in soft bottom areas with large amounts of mud. In the San Diego Bay mudflats, the California horn snail (*Cerithidea californica*) is characteristic (Thompson et al. 1993). The fiddler crab (*Uca crenulata*) burrows into the mud banks in the high-tidal zone. The mud or yellow shore crab (*Hemigrapsus oregonesis*) is more common and inhabits a wider zone than the fiddler crab. Also common are the littleneck clam (*Protothaca staminea*) and the California jackknife clam (*Tagelus californianus*). These species prefer mud because it contains more bacteria, which is their food. In contrast, suspension feeders are more common in soft bottom areas where sandy sediments predominate, such as in some areas of central and north San Diego Bay, and in the ocean waters. Bacteria associated with the detritus and sediment are believed to be a primary food source of deposit feeders. These invertebrates tend to consume muddy sediments in preference to sandy ones because the surface area to volume ratio is greater in mud, allowing more bacterial colonization of the grain surfaces. As a result, deposit feeding species tend to predominate in soft bottom areas with large amounts of silt and clay, the primary sediment type throughout most of San Diego Bay. Another reason for this relationship is that more detritus accumulates in the interstitial spaces between fine sediment particles than between those of larger grain size.

Some soft bottom invertebrates are so small that they live and move around in the spaces between the sediment grains or attach to the grains. These are called the interstitial fauna. They include protozoans, nematodes, hydroids, polychaete and oligochaete worms, flatworms, copepods, gastrotrichs, kinorhynchs, rotifers, archiannelids, and gnathostomulids. It should be noted that most of these interstitial species do not appear in the species list for San Diego Bay or elsewhere; most pass through the 0.02-inch sieves normally used to process standard infauna samples.

Detritus is also considered to be the most important food source for the interstitial fauna, as it is for larger infauna and invertebrates. However, many interstitial species are predators or scavengers. Others are grazing herbivores that feed on diatoms living in the upper few millimeters of the sediment.

An unusual animal, a colonial ectoproct or bryozoans called *Zoobotryon verticillatum*, is present on the bottom sediment throughout much of south San Diego Bay, where it forms large, flexible, tree-like masses during the warmer months of the year. Some clumps are attached to shell material embedded in the sediment or attached to algae, while much of it simply moves around freely on the bottom. Like the benthic plants discussed above, it serves as food for a variety of invertebrates and as refuge or cover for both motile invertebrates and small fish. It is a suspension feeder.

Because of their limited coverage, the data currently available are insufficient to characterize the numerically dominant species of these major taxonomic groups in central San Diego Bay. The most complete, recent species list for infauna of these areas of San Diego Bay is that reported in Table 7 of the study by Fairey et al. (1996). However, comparison of the data for infaunal invertebrates reported from north and central San Diego Bay by Ford et al. (1975) and Fairey et al. (1996) with those for the south San Diego Bay (MacDonald et al. 1990) indicates that there is considerable overlap, with many of the same species occurring in all three areas.

Unvegetated shallows support species assemblages that are distinct from vegetated shallows (Kramer 1990, Takahashi 1992a, Allen 1997). Many of the invertebrates serve as food sources for the demersal fish, such as the small juvenile halibut that are restricted primarily to unvegetated shallows of unconsolidated sediment in bays and estuaries (Allen 1982, Kramer 1990).

### *Eelgrass Beds*

On the basis of a seasonal study of eelgrass beds in central San Diego Bay, Takahashi (1992b) and Takahashi and Ford (1992) reported 117 different species or higher taxa of invertebrates associated with this habitat. Polychaete worms were the dominant group during all seasons and at all sampling sites. Of these, the two dominant infaunal species were *Lumbrineris zonata* and *Exogone lourei,* both considered to be deposit feeders. Most of the abundant polychaete species found in eelgrass beds are deposit feeders.

Takahashi (1992b) found that the other dominant invertebrate groups in San Diego Bay eelgrass beds were crustaceans and molluscs. Among crustaceans, the dominant forms were either tube-forming or infaunal amphipods. Tanaid crustaceans were more abundant than amphipods only in the January samples. The high densities of amphipods in eelgrass beds may occur because of the protection afforded by the eelgrass blades. The introduced Asian mussel, *Musculista senhousia*, was the dominant bivalve mollusc at all sites throughout the study. Gastropod mollusc species were also dominant forms.

Takahashi (1992b) found that, besides a greater number of infaunal species, densities were considerably higher in the San Diego Bay eelgrass beds sampled than those values reported for adjacent, unvegetated areas of unconsolidated sediment. In addition, the infaunal species composition of these two habitats differed very markedly, with consistently greater numbers of polychaete, amphipod, and mollusc species present in the eelgrass bed habitat and with relatively few species common to both habitats.

### *Artificial Structures*

Davis et al. (2002) studied the communities on the riprap lining San Diego Bay to illustrate the role of wave exposure in structuring the intertidal communities. On average, riprap and natural rocky habitats in wave-exposed environments in southern California did not differ from each other in diversity or community composition. Sessile species made up the majority of species recorded, and no differences were found in diversity or community structure when they were part of the analyses. Mobile species, when considered on their own were more diverse on natural shores, largely driven by a handful of molluscan species that were relatively uncommon (Pister 2007).

A multiseason study was conducted on the concrete and wooden piling structures of the B Street, Broadway, and Navy piers during 1972–1973 (Ford et al. 1975). The results of this study showed that epifaunal invertebrates and associated algae living on the pilings changed fairly markedly in species composition and abundance from one season to the next. Pilings were sampled at a series of intertidal and subtidal depths to obtain quantitative data on species composition, abundance, and distribution of marine algae, invertebrates, and fish. Sponges, cnidarians (sea anemones, hydroids, and others), bryozoans, polychaete worms, crustaceans, molluscs, and tunicates dominated the rich sessile (attached to the bottom or a surface) and free-living invertebrate fauna associated with concrete and wooden pier pilings in this study area in terms of numbers of species, abundance, surface coverage, and biomass (Ford et al. 1975). These same animal groups also appear to be the dominant forms on similar structures elsewhere in San Diego Bay. Of the invertebrate species encountered on pier pilings in the study area during the period September 1972–August 1973, five (2 percent) were sponges, 24 (8 percent) were cnidarians, seven (2.5 percent) were bryozoans, 89 (30 percent) were polychaetes, 75 (27 percent) were crustaceans, 65 (23 percent) were molluscs, and seven (2.5 percent) were tunicates (Ford et al. 1975). With the exception of the purple-hinge rock scallop, *Crassadoma gigantea,* none of these species is of commercial or sport fishing importance.

### *Nearshore Ocean and Surf Zone*

The nearshore is occupied by species commonly associated with sand and wave action, such as tube-building polychaete worms (*Diopatra ornate*), sand dollar (*Dendraster excentricus*), and sea pansy (*Renilla kollikeri*). Other sand bottom species include sea pens (*Stylatula elongate*), the bivalve *Tellina modesta*, and the gastropod *Caecum crebricinctum*. Key predators in sandy subtidal habitats can include armored sea stars (*Astropecten* spp.), bat rays, round stingrays, leopard sharks (*Triakis semifasciata*), California halibut, and sole (Family Pleuronectidae).

While most species are those associated with the nearshore coastal pelagic sandy bottom, there are also species commonly associated with hard substrate in the boulder and cobble areas of SSTC-S (Tierra Data Inc. 2006). Most invertebrates were observed attached to understory fleshy algae and persisted in the form of epiphytic bryozoans within the cobble and boulder areas. Cobble areas were interspersed with gravel and sand and appeared to have a relatively low biomass of both algae and invertebrates. Several ornate tubeworms (*Diopatra ornata*) were observed as well as shells from various bivalves.

Macroinvertebrate species commonly associated with the understory algae present off of SSTC-S include sea urchins, seastars, and gastropods, although most nearshore phyla are represented. The invertebrate communities in the understory algae ecotype are similar to those found in kelp beds.

The upper intertidal or splash zone is characterized by simple green algae (*Chaetomorpha, Enteromorpha, Ulva*), barnacles (*Balanus* spp., *Cthamalus* sp.), limpets (*Lottia* spp.), and periwinkles (*Littorina* spp.). Coralline algae (*Corallina* spp.) is expected to be a dominant algae on the sparse, low relief rocky substrate in the mid-to-low intertidal zone, typical of other San Diego beaches (SANDAG 2000). Intertidal substrates less influenced by sand burial and abrasion often support California mussel (*Mytilus californus*), gooseneck barnacle (*Pollicipes polymerus*), aggregating sea anemones (*Anthopleura elegantissima*), hermit crabs (e.g., *Pagurus*), a variety of snails (e.g., *Lithopoma, Kelletia, Tegula*), chitons (e.g., *Mopalia*), and annual species of algae.

Whereas the density of surface-dwelling (epifaunal) species declines with depth, that of the burrowing infauna increases (Barnard 1963), probably because of the greater stability of the sediments (Thompson et al. 1993). There also appears to be a shift from infaunal communities dominated by crustaceans (such as lobsters, crabs, and shrimp) to communities in which polychaetes (marine worms) are predominant. Oliver et al. (1980) ascribed this pattern in Monterey Bay to the effects of substrate disturbance. In San Diego County (Dexter 1978; VanBlaricom 1978), amphipod crustaceans dominated infaunal assemblages at both shallow (< 26 feet) and moderately deep (56 feet) sites, but the densities of common infaunal species were about two orders of magnitude higher at the deep site (Table 3.7-7). Polychaetes dominated the infaunal assemblage in samples from sites deeper than about 66 feet (Thompson et al. 1993).

**Table 3.7-7: Relative Abundance of Common Infaunal Invertebrates (<33 feet) and a Deeper (56 foot) Site**

| | Imperial Beach (3-33 feet) | | La Jolla (56 feet) | |
|---|---|---|---|---|
| **Taxonomic Group** | **Number/m²** | **Percent of Total** | **Number/m²** | **Percent of Total** |
| Polychaetes (marine worms) | 99 | 5 | 2400 | 16 |
| Crustaceans | 219 | 56 | 10900 | 72 |
| Molluscs | 42 | 11 | 1500 | 10 |
| Other | 34 | 9 | 400 | 3 |

Note: The shallow site was off of Imperial Beach (Dexter 1978) and the deeper site was off of La Jolla (VanBlaricom 1982), as reported in Thompson et al. (1993). $m^2$ – square meters

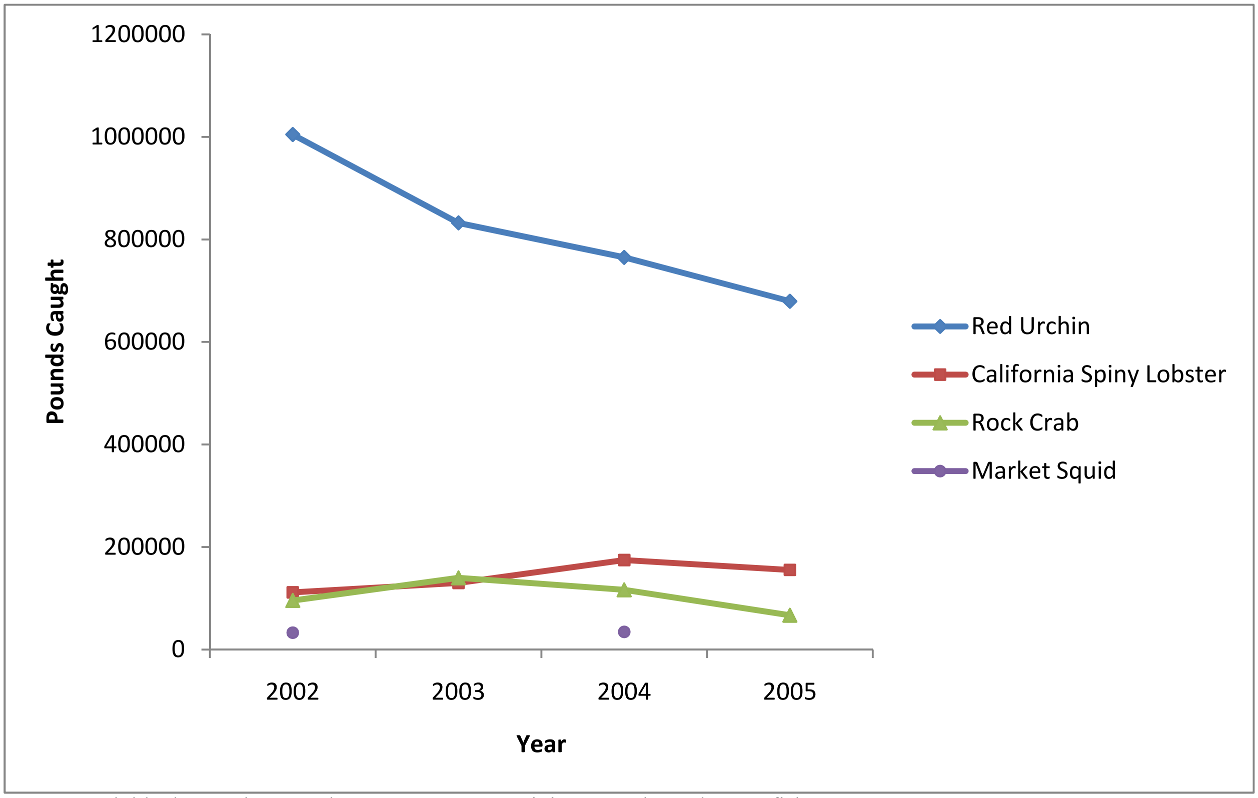
### *Sport Fishing Species*

Some species of common intertidal and subtidal bivalve molluscs inhabiting south San Diego Bay are used as human food, and the area has long been considered good for clam digging. These include the banded, smooth, and wavy cockle clams (*Chione californiensis*, *C. fluctifraga*, and *C. undatella*), the littleneck clam (*Protothaca staminea*), the bent-nosed clam, and others (Ford and Chambers 1973). However, the size of most individuals of these species appears to be small compared with those in nearby clamming areas, such as the San Diego River mouth. The jackknife clam (*Tagelus californianus* and *T. subteres*), rosy razor clam (*Solen rosaceus*), and other small bivalves are commonly used as bait for fishing. The ghost shrimp is also used as bait.

On the ocean side, several of the catch blocks reported by CDFG (blocks 860, 877, and 878 using all gear types) from 2002-2005 overlap the SSTC activity area. The top four species are shown below in Figure 3.7-8. Other catches include warty sea cucumber, spider crab, top snail, spot prawn, Kellet's whelk, octopus, and ghost shrimp.

## Invasive Species

Aquatic invasive species disrupt the balance of natural ecosystems by consuming or competing with native plants and animals, altering biogeochemical cycles, and reducing native biodiversity. Invasive marine species have arrived in the ROI from all over the world through direct and indirect means, and for intentional and unintentional purposes. Invasion risks stem from hull fouling, ballast water exchanges, and from aquarium, pet, nursery, aquaculture, and seafood industry trade. The following vectors could pertain to the ROI (as identified by CDFG 2006): ships and boats; dry docks, navigation buoys and marine floats; floating marine debris, such as floating nets and plastic detritus; recreational boats and equipment such as small recreational craft, snorkeling and self-contained underwater breathing apparatus (SCUBA) gear, fins, wetsuits, jet skis, and similar materials; restoration projects due to the movement of marsh, dune, or seagrasses as well as associated organisms; intracoastal spread by unknown mechanisms; and natural migrations to new areas.




Note: Catch blocks overlap nearshore ocean SSTC activity areas dependent on fishery

**Figure 3.7-8: Invertebrate Catch Block Totals for Top Four Invertebrate Species Reported by CDFG from 2002-2005**

USACE permit projects involving disturbing activities in bay substrates require surveys for *Caulerpa taxifolia*, an invasive aquatic alga. The Navy conducts project related surveys within the bay concurrently with routine inventories in San Diego Bay, such as monitoring eelgrass transects to evaluate eelgrass habitat and confirm the absence of *Caulerpa* spp.. Native to the Indian ocean and believed to be an accidental introduction of the aquarium trade into southern California coastal waters, the alga produces a large amount of a single chemical that is toxic to fish and other would-be predators. In areas where the species has become well established, it has caused ecological and economic devastation by overgrowing and eliminating native seaweeds, seagrasses, reefs, and other communities. This alga is considered a substantial threat to marine ecosystems in Southern California, particularly to the extensive eelgrass meadows that make coastal waters such a rich and productive environment for fish and birds.

### Essential Fish Habitat

Essential Fish Habitat (EFH) is defined in the Magnuson-Stevens Act as “those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity.” For the purpose of interpreting the definition of EFH, “waters” include aquatic areas and the associated physical, chemical, and biological properties that are used by fish, and may include historic areas where appropriate; “substrate” includes sediment, hard-bottom structures underlying the waters, and associated biological communities; and “necessary” means the habitat required to support a sustainable fishery and a healthy ecosystem. The complete life cycle is included in spawning, breeding, feeding, or growth to maturity. The coastal waters of southern California—up to 3 miles offshore—to 200 nm offshore (i.e., the U.S. Exclusive Economic Zone) are designated as EFH for the species listed in the Coastal Species Fishery Management Plans (FMP) and the Pacific Coast Groundfish FMP.

Under the EFH program, all federal agencies must consult with NMFS on any action or Proposed Action that may adversely affect EFH. An adverse effect may include direct (e.g., contamination or direct kills), indirect (e.g., loss of prey), site-specific, or habitat-wide impacts. Consultations are conducted in conjunction with other federal statutes, such as the National Environmental Policy Act (NEPA), CWA, or Endangered Species Act (ESA). NMFS provides recommendations to minimize, offset, or mitigate impacts. Within 30 days the federal agency responds with a description of measures to be taken, or with a scientifically sound explanation for not following recommendations.

Temporary impacts are those that are limited in duration and that allow the particular environment to recover without measurable impact. Minimal impacts are those that may result in small changes to the affected environment and insignificant changes in ecological functions. Even minor, localized effects can be adverse when the reduction in the quality and/or quantity of EFH is significant. Types or categories of Navy actions may be removed from further consultation requirements if NMFS determines that they will likely result in no more than minimal individual or cumulative adverse effects individually or cumulatively. The U.S. Navy has conducted an EFH assessment to establish all potential EFH impacts and has consulted with the NMFS regarding potential effects to EFH.

The Navy is in the process of studying EFH throughout San Diego Bay (Merkel, 2008 in prep). The purpose of this study is to facilitate the valuation of habitats in the context of the EFH designation with special focus on the habitat types most likely to be impacted by Navy activities or to be used in the mitigation for potential Navy project impacts. The completion of this project will result in two products: 1) a broad scale, qualitative assessment of the dominant habitat classifications within San Diego Bay with a map and description of those habitats; and 2) a detailed and quantitative description of a smaller set of habitats determined to be of greatest concern to the Navy. The habitat characterization is intended not only to provide information on the use of habitat by managed fish species, but also to provide information on ecosystem function and productivity within the dominant habitats present in the bay. The study will better describe and identify EFH locations in order to minimize, to the extent practicable, adverse effects on this habitat and to identify actions that may encourage the conservation and enhancement of EFH.

#### 3.7.1.4 Regulatory Requirements

For projects and federal activities within marine waters, key jurisdictions and laws pertain based on parameters such as distance from shore, tidal depth, habitat and individual species group. Since the location in conjunction with the proposed action can trigger different regulations based on these factors a number of laws and regulations may apply. In this section we will discuss Magnuson Stevens Fishery Conservation and Management Act and Section 404 of the Clean Water Act as it pertains to EFH and eelgrass and mudflats because other regulatory discussions occur elsewhere in this EIS. Examples are: ESA, Coastal Zone Management Act, Clean Water Act Section 401 Water Quality, Executive Order 11990 “Protection of Wetlands”, Marine Mammal Protection Act, and Migratory Bird Treaty Act.

The 1996 amendments to the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) set forth EFH provisions to identify and protect important habitats of federally managed marine and anadromous fish species. The water areas of SSTC are designated as EFH for two FMPs: the Pacific Groundfish and Coastal Pelagics FMP’s (Pacific Fishery Management Council [PFMC] 1998a, 1998b). EFH that is considered to be particularly important to the long-term productivity of populations of one or more managed species, or to be particularly vulnerable to degradation, may also be identified by NMFS as Habitat Areas of Particular Concern (HAPC). Eelgrass beds are considered a HAPC, and are located throughout the San Diego Bay.

Both mudflats and eelgrass beds are considered “Special Aquatic Sites” under Section 404 of the CWA, and therefore projects that cause discharge of dredge or fill must be permitted by the USACE. Any type of in-water construction that affects substrate, therefore, must be permitted. The USEPA Guidelines under the CWA for Special Aquatic Sites, in addition to the broader guidelines, apply a burden of proof requirement to demonstrate that no practicable alternatives exist that will meet a project's purpose.

Under Section 404 of the CWA mitigation requirements, eelgrass is also managed in compliance with the Southern California Eelgrass Mitigation Policy, created jointly in 1991 by USFWS, NMFS, and CDFG This policy established protocols for mitigating adverse impacts to eelgrass. Project sponsors must follow the guidelines of how and when to survey, map, choose a mitigation site, replant, monitor, and establish success criteria for the eelgrass. Delays in any of these stages can result in financial penalties.

Since mudflats are used by many migratory birds, mostly shorebirds, and may be occupied by the federally threatened western snowy plover (protected under the ESA), USFWS is often the lead authority on activities in mudflats. Both NMFS and CDFG comment on activities in mudflats as they provide forage for fish. The California Coastal Commission (CCC) also regulates mudflats under their definition of a wetland, which includes a 100-foot buffer on the upland edge (14 California Code of Regulations [CCR] 13577).

Mudflats are also considered a Special Aquatic Site under the CWA. The Naval Base Coronado (NBC) INRMP gives priority to unvegetated mudflats for when restoration opportunities arrive, because it has historically a habitat that has been filled or dredged since the late 1800s, such that it is one of the most absent habitats in the bay compared to its historic area. The Navy and Port of San Diego have both sought to recover some mudflat acreage in various restoration work because of the high priority placed on it in the joint INRMP. The Navy succeeded in adding some such acreage when it established Homeport Island in the ROI.

The Elevated Causeway System (ELCAS) training operation has been covered under a Clean Water Act Section 404 permit since 1994 at Orange Beach (oceanside), and since 1995 at Bravo Beach (bayside). The Navy made a request to the USACE in October 1995 for a modification to their bayside Bravo permit due to changes in the number of causeway sections and frequency of the activity, in preparation for an October 1995 Bravo ELCAS operation. Letters in 1991 and in 1995 from NMFS expressed concern that adverse effects to eelgrass associated with ELCAS were not properly mitigated for. An environmental assessment process had begun by then. When the ELCAS permit for Bravo Beach expired again in February 1998, a letter requesting permit extension was met with negative comments from the USFWS and NMFS because of the delayed NAB Operations and Training EA. This EA was never completed due to the increased presence of CLT and western snowy plovers, and eelgrass impact concerns and it was suggested (and later confirmed) that the EA should be developed into an EIS. Table 3.7-8 summarizes the chronology of CWA-related permits and other agreements associated with Navy impacts to jurisdictional waters within the ROI.

**Table 3.7-8: Chronology of Section 404 (CWA) Permits, Records of Decisions, and Other Agreements Related to Impacts to Jurisdictional Waters, Including Eelgrass**

| Project Driver of Consultation or Agreement | Document and Year |
|---|---|
| ELCAS and other training at SSTC-N.<br>Permit acquired for ELCAS activities at Orange Beach (oceanside) and Bravo Beach (bayside). ELCAS training conducted in September 1991 resulted in documented loss of 7,800 square feet of eelgrass at Charlie Beach. | USACE Permit 94-20-006-00DZ-ATF In-water Construction Orange Beach Ocean Side. 1994<br>USACE Permit No. 95-20066-DZ Bayside ELCAS at Bravo Beach. 1995 |
| Modification to bayside (Bravo Beach) ELCAS activity permit to facilitate Navy ELCAS exercises twice a year with 12 causeway sections. | Modification to USACE Permit<br>95-20066-DZ 1995 |
| Amendment to allow time extension to 28 February 1999 for temporary amphibious training activities and completion of final NEPA (environmental assessment) and ESA compliance documents. | Amendment to Permit 95-20066-DZ under 33 CFR 325.6(d) 1998 |
| Extended Bravo Beach ELCAS training permit for one year. | Permit Extension 95-20066-DZ 1998 |
| Extended completion date under permit from 28 February 1999 to 28 February 2005. Regular updates since 2005. | Permit Extension 95-20066-DZ 1999 |
| Establish eight-acre eelgrass mitigation site to replace 6.7 acres lost at the wharf site. An upland area of 14 acres was excavated at Pier Bravo to compensate for the loss of 13.4 acres of intertidal and subtidal habitat. | Nuclear Carrier (CVN) I Environmental Impact Statement and Record of Decision 1995. USACE Permit |
| Create 27 acres of intertidal/subtidal habitat off the south shore of SSTC-N using dredge material; establish fish habitat enhancement structures within the site; create 4-acre eelgrass mitigation bank south of SSTC-N; create 1.5 acres of intertidal habitat by excavating existing uplands on the west shore of NAS North Island (near Pier Bravo). | CVN II Environmental Impact Statement and Record of Decision with USACE Permit No. 982004900-KMM 2000 |
| Navy Eelgrass Mitigation Sites (NEMS) and Eelgrass Mitigation Bank.<br>NEMS are preestablished Navy locations for mitigating eelgrass. The eelgrass banking agreement is used for mitigation, as appropriate, for impacts associated with military construction, maintenance, and operational needs, and to establish surplus credits for future use. | NEMS ongoing<br>Banking Agreement signed 2008 |

### 3.7.1.5 Current Management and Mitigation Measures

#### 3.7.1.5.1 Current Management of Marine Special Aquatic Sites

Navy natural resources are managed through Integrated Natural Resources Management Plans (INRMPs), which are intended to take an ecosystem approach to natural resources planning. The purpose of an INRMP is to help installation commanders manage their natural resources in a manner that is consistent with sustainability of those resources and to ensure continued support of the military mission. These are long-term, collaborative strategies for managing natural resources as required by the Sikes Act Improvement Act of 1997 (SAIA). INRMPs, as defined under the SAIA, are developed jointly by the Navy and fish and wildlife agencies such as the CDFG, USFWS, and other resource agencies as appropriate. Terrestrial and marine aspects of natural resources management are addressed in the NBC INRMP. The NBC INRMP was completed in 2002 and is in the process of being revised; natural resources staff also provides day-to-day management based on current circumstances. The San Diego Bay INRMP is also in the process of being revised.

As part of implementing the San Diego Bay INRMP, eelgrass is mapped throughout San Diego Bay about every three to five years jointly by the Navy and Port of San Diego eelgrass transects are monitored on an annual basis by the Navy and Port of San Diego.

### Current Management of Invertebrates as Water and Sediment Quality Indicators

The Navy participates in the national water quality monitoring program called Mussel Watch. NOAA's National Status and Trends Program Mussel Watch Project (1986-present) monitors bioaccumulation in mussels, plus other parameters offshore in south San Diego Bay and intertidal and offshore in north San Diego Bay. NOAA also conducts the National Benthic Surveillance Program (1984-present) to examine physical, chemical, and biological (diseases and bioaccumulation in fish) parameters in offshore areas of central and north San Diego Bay.

### 3.7.1.5.2 Current Mitigation Measures

The sections above describe special aquatic sites, and what the Navy does to monitor their status and to comply with state and federal regulations.

Eelgrass is managed in compliance with the Southern California Eelgrass Mitigation Policy, created jointly in 1991 by USFWS, NMFS, and CDFG, which established protocols for mitigating adverse impacts to eelgrass. Project sponsors must follow the guidelines of how and when to survey, map, choose a mitigation site, replant, monitor, and meet success criteria for the eelgrass. Delays in any of these stages can result in financial penalties. The Navy has established several Navy Eelgrass Mitigation Sites (NEMS) to compensate for past impacts and to mitigate future impacts on eelgrass habitat within San Diego Bay. Eelgrass that has been planted and not used to compensate for previous losses has been banked for future use in accordance with the Southern California Eelgrass Mitigation Policy. Five eelgrass mitigation sites contributing to the bank have already been constructed and met the five-year performance standards required by NMFS. This mitigation banking agreement between the Navy and NMFS was recently signed as the Navy's Eelgrass Mitigation Bank Management Plan, and establishes a system of management, administration, and accounting for the Navy (DoN, 2008). The principal goal of the mitigation bank is to establish functional eelgrass habitat qualifying as a special aquatic site, as defined in 40 CFR 230.40-45, within San Diego Bay for mitigating impacts associated with projects and operational training needs, and to establish credits from surplus habitats for future use. A Mitigation Bank Technical Team, a multiagency team, provides technical expertise in and support for implementing the Bank. The team includes the Navy as Chair, USACE, USFWS, NMFS, and CDFG.

Besides the NEMS, the Navy maintains permanent eelgrass monitoring transects in San Diego Bay that are monitored every year (Figure 3.7-9) and bay wide mapping of eelgrass density classes is conducted every three to five years in a joint Navy-Port of San Diego effort (1994, 1999/2000, 2004, and 2008, the most current 2008 data was recently made available (DoN, 2009). This monitoring program allows the Navy to track fluctuations in the coverage, extent, and health of eelgrass in San Diego Bay. These data provide a valuable long-term perspective that can help identify effects from catastrophic, as well as seasonal natural and anthropogenic events.

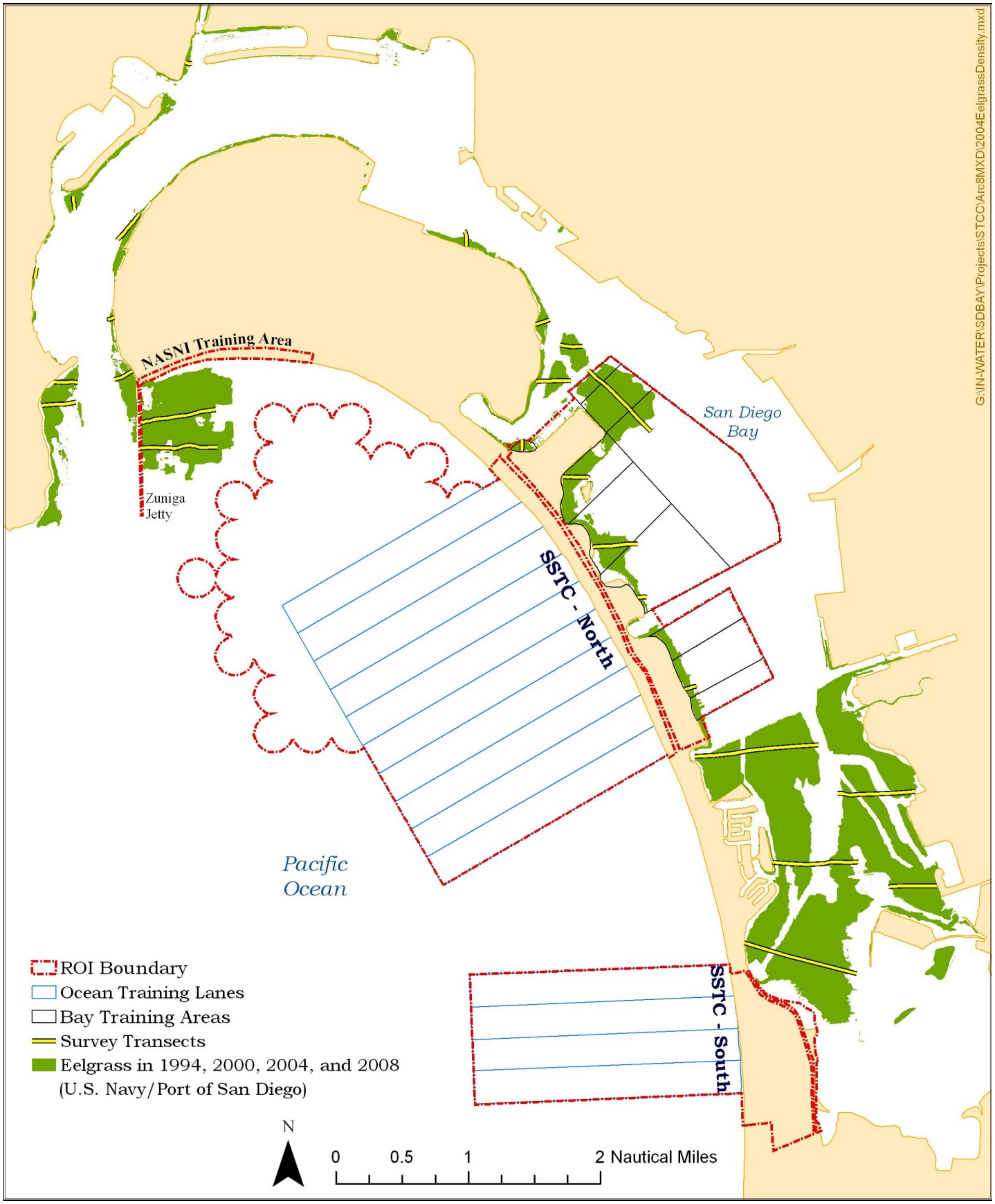



**Figure 3.7-9: Permanent Eelgrass Monitoring Transects**

### 3.7.2 Environmental Consequences

In order to assess the impact of the Proposed Action on the marine plant and invertebrate resources (including algae) in the ROI, training was divided into constituent activities that have the potential to impact the environment. These activities occur at a defined frequency, duration, intensity, and location in space; therefore, their effect on the environment can be assessed, based on the best available biological information.

There are seven activities addressed in the following analysis: marine surface vessel activities, underwater detonations on the sea floor, amphibious activities, and beach activities including fluid transfer, vehicle use, concentrated foot traffic, and manual excavations. Information about the location where the activities take place as well as their footprint was obtained through interviews with Navy training professionals. The types of military activities that could affect marine plants and invertebrates are those that take place in the marine environment and are described below. Each of these activities may be found in common among multiple training activities (Tables 2-2 and 2-3 in Chapter 2). When the activities are combined, they encompass the total effect of the increased frequency of training activities on the environment.

Certain activities are excluded from analysis because they are not expected to affect marine plants, algae, or invertebrates. For example, marine vessels that do not land are excluded, whereas landing craft are analyzed because they may scour the bottom of the nearshore or intertidal area as they beach. Portions of training activities in which interactions between personnel/craft and marine invertebrates and plants are anticipated to be extremely infrequent, such as swimming, SCUBA diving, or activities that utilize only nonmotorized combat raiding rubber craft (CRRCs), are excluded from individual activity analysis as potential impacts from interactions would be minimal to nonexistent (Activities 8, 14, 18, 20, 54-56, 60, 64, 67, 69-71, 73, 78, Table 2-2). Activities that occur inland at SSTC-S or air activities are not discussed in this analysis. Exercises which contain air activities that are excluded from this analysis include Activities 4, 6, 7, 16, 25, 26, 29, 30, 35, and 66 (Table 2-2). Training activities that occur exclusively on the land portion of SSTC (Activities 15, 17, 19, 31, 36, 43, 47, 48, 58, 59, 61, 62, 63 65, 68, 72, 74, 75, 76, and N11, Tables 2-2 and 2-3) that are not anticipated to interact with the marine environment are excluded from this analysis as they are not expected to impact marine plants or invertebrates that may be present adjacent to SSTC beaches or bayside training areas.

Foot traffic, manual excavations, or raid and reconnaissance activities across the intertidal zone are normally excluded from analysis because it is dispersed across a large area with low plant or invertebrate density. However, concentrated foot traffic over rock jetties has a higher likelihood of impacting invertebrates, so it is discussed here.

Midwater detonations are excluded because they are very unlikely to affect high numbers of invertebrates; in contrast, sea floor detonations are analyzed here where invertebrates are more concentrated compared to the water column. Invertebrates in the form of ichthyoplankton are analyzed under Fish (Section 3.8).

#### 3.7.2.1 Approach to Analysis

Each analysis section that follows lists the included activities, with an example accounting how the level of activity was calculated or analyzed, such as the number of troops, units, vessels, landing craft, events, etc. Following this, the location of the activity and how large a footprint each activity normally requires is considered, such as the general location on the water where the activity takes place. The location of the activity can determine how it could affect resources that are not evenly dispersed across the environment. SSTC-N, SSTC-S, and portions of NASNI all support different resource patterns layered with different management strategies. In addition to this, military trainers use the landscape in certain ways to instruct trainees for combat. For example, the Silver Strand beaches stretch inland, showing a positive slope, from the high tide line to about 20 yards inland, towards a feature called the beach “crest.” This crest is a high point on the beach where the slope of the shore changes from positive to neutral (the beach levels out). Military trainers use this feature in the design of exercises and activities sometimes stay below this crest or can concentrate around or above it.

Once the activities are analyzed, this information is juxtaposed with the resource of concern. Activities under alternatives avoid effects on marine algae, plants, and invertebrates in areas where densities of these organisms are the greatest: the salt marsh, mudflat, and salt pond. Effects may be considered where activities take place in the subtidal environment, which is primarily soft bottom substrate and prone to changes in turbidity, and the intertidal sandy beaches up to the wrack line (the row of debris that demarks the last high tide). Sandy beaches are a stressful environment for plant and invertebrate organisms, which must adapt to extremes of temperature, dehydration (dessication), and salinity, as well as the mechanical wash and backwash of waves. These extremes are pronounced on sandy shores, and so sandy shores are less biologically diverse due to the magnitude of environmental rigor these species have to endure. The invertebrate community of the sandy beach may be characterized by short life spans and rapid population turnover. The abundance and diversity of fauna of a typical sand flat can also vary by orders of magnitude within and among years (Nybakken 1997). Animals with permanent burrows are few, and the composition of fauna is dominated by pioneering species. Invertebrate densities increase as wetting and drying of the sand grains becomes less extreme, and wave turbulence is reduced at lower tidal elevations. The exception to the relatively barren beach environment is the wrack line (the accumulated organic debris left behind as the high tide recedes), which provides forage for shorebirds and can function as a precursor to dune formation and vegetation establishment on the upper beach (the beach wrack line and higher elevations are addressed separately under 3.11 Terrestrial Biological Resources and 3.12 Birds).

The baseline condition for marine plants and invertebrates is estimated, based on the information described under the Affected Environment, in terms of relative abundance of plants, algae, and invertebrates. However, while the information is the best available, data on absolute abundance of these organisms for San Diego Bay or the nearshore coastal areas of interest are isolated and few. Thus, effects on marine plants and invertebrates are expressed in relative terms.

Disturbance of marine plants and invertebrates or modification of their habitat from activities are evaluated based on the area the individual activity encompasses and the value and type of habitat known to occur within the specific footprint. The size of the effect is determined by comparing the area of impact to habitat availability or scarcity, and whether the impacted resource has a special sensitivity status as recognized by governing resource agencies. Effects are also considered larger if the intensity, duration, or frequency of the activity is such that the area cannot recolonize to former species abundance levels; the loss of habitat or habitat value (based on organism density or relative abundance) is considered permanent compared to background variation in these conditions. Training that does not interface with the marine environment (air and terrestrial activities) will not be analyzed by individual activity in this analysis and will be summarized to have no impacts to marine habitats or communities.

### 3.7.2.2 No Action Alternative

The No Action Alternative would maintain the baseline level and types of training that occur in the ROI as listed in Chapter 2 (Table 2-1); current management measures would also remain unchanged. As discussed in the Approach to Analysis, this section focuses on groups of activities that have the potential to result in an impact to marine plants or invertebrates.

#### 3.7.2.2.1 Marine Vessel Activities

Vessels used in the ROI consist of power-driven surface ships and small craft. Power-driven vessels may be either propelled by water jet pump or propeller however the effect of these different forms of propulsion on marine plants and invertebrates is assumed to be approximately equivalent. Sailing vessels and vessels under oars are excluded from this analysis because they do not affect marine plants or invertebrates in the ROI. Power-driven surface craft can be used in entirely water-based activities where trainees practice navigation, mock boat attacks, boarding drills, safety monitoring for swimmers, and other activities. These water-only boat activities are excluded from analysis because the boats remain in deeper water where they do not contact the ocean or San Diego Bay floor, including with their propellers. Potential impacts to marine plants and invertebrates from marine vessel activities are focused on activities that involve operating or landing within the intertidal environment and have the potential for disturbing the underlying substrate that may contain marine plants or organisms at varying densities based on habitat conditions. These impacts include churning and excavation of sediment, and potential chopping of eelgrass blades and reproductive structures.

In addition to water-only activities, boats in the ROI may come ashore or beach to deliver trainees or equipment to and from shore. This beaching activity has a potential for effect as the boat contacts and disturbs the marine plants, algae, or invertebrates in the sediment where it lands. Propeller-driven craft impact eelgrass and marine algae beds if they are used in the calmer San Diego Bay waters where these organisms grow, especially on lower tides, and if deeper-draft vessels are utilized.. In the following breakdown for analysis purposes, the very nearshore and boat beaching activities are divided into small and large power-driven vessels. Many take place in the oceanside training lanes, but some also take place in the bayside Bravo training area. Both jets and propellers may stir up sediment, and thus result in a short-term, temporary increase in turbidity. Turbidity obscures light and thus affects the ability of photosynthetic plants and plankton to produce energy from sunlight, and the ability for predatory fish and macroinvertebrates to forage. Mudflats and salt marsh areas, which are rich in marine algae and invertebrates, are not an entry point chosen by operators of propeller-driven craft, due to the likelihood of grounding.

Small power-driven vessels are used in almost every water-based training activity in the ROI, either as a principal element of the training or for support, such as safety and security boats. Under the No Action Alternative, training activities involve propeller and jet driven surface craft. Activities occur in both San Diego Bay and in the oceanside training lanes, and to varying degrees vessels land on beaches in both areas. These vessels include zodiacs, CRRCs, Rigid Hull Inflatable Boats (RHIBs), Landing Craft Utility (LCUs), Landing Craft Mechanized (LCMs), barge ferries, warping tugs, and Maritime Prepositioned Force (MPF) Utility Boats. These vessels come ashore or beach under 21 separate training activities under the No Action Alternative. Small vessel beaching takes place primarily in the oceanside training lanes, except under Activities 21, 32, 33, and 34 (Table 2-1). The number of vessels uses in each activity varies, but on average is four boats per event, with CRRCs and RHIBS being used in the majority of events, as detailed in Appendix B.

The effect of small, power-driven boats on the oceanside beach lanes may be discounted due to the dispersed nature of the activity in areas of high-energy surf and expected low abundance of invertebrates. While the potential effect is present bayside, it is reduced to small patches of eelgrass, bayside entries at low tide, locations of repeated entry, and mechanized craft only when they land ashore, such as from the churning of boat propellers in eelgrass beds. Regrowth of eelgrass and associated invertebrate colonization occurs quickly when water temperature and clarity are favorable. For example, Pondella (2006) assessed the success of an eelgrass mitigation site completed in 1997 at North Island for fishes over a five-year period surveyed regularly from September 1997 to September 2002. The newly created eelgrass habitat performed at the level of an existing, nearby eelgrass bed in about one year. The overall analysis found that the mitigation eelgrass habitat was not significantly different from the reference eelgrass habitat in terms of fishes. Eelgrass reestablishes on its own from plant propagules, and invertebrates recolonize relatively quickly. Therefore, any effect is considered localized, on the order of a very few square feet, and temporary.

Because of their greater size and power, large power-driven vessels have more potential impact on marine plants and invertebrates in the ROI. These vessels include MK V Special Operations Craft (SOC), LCM/LCUs, and other boats for transporting large number of people or equipment. During certain activities these boats get close to shore and can beach. Activities which include beaching of large power-driven vessels or those in which the vessels get close enough to shore to disturb the substrate or could cause an increase in turbidity with propeller or jet disturbance are presented in Chapter 2 (Table 2-1) and detailed in Appendix B. Turbidity obscures light and thus affects the ability of photosynthetic plants and plankton to produce energy from sunlight, and the ability for predatory fish and macroinvertebrates to forage. Turbidity could temporarily limit light for photosynthesis but to no greater extent than the tide does twice over the entire year The large vessel beaching activities occurring in San Diego Bay that could potentially impact eelgrass habitat are limited to a designated training lane on Bravo Beach.

LCACs are very large marine vessels that approach the shore and potentially beach. They are not driven by underwater propellers but ride on the surface of the water on a cushion of air. Under the No Action Alternative LCAC (Activity 27, Table 2-1) occurs four times annually. They are scheduled to occur on any oceanside beach training area including lanes 1-14 and the Breakers Beach area of NASNI. Its footprint includes its physical structure plus the area surrounding it, which is affected by the strong winds it produces. An LCAC comes ashore near the crest of the beach.

The LCAC approaches the sandy beach and disperses sediments and vegetation in its path through wind and direct impact. The safety zone for humans around an LCAC is a 100-yard radius, although sand can be blown further at times. The density of invertebrates in the sand itself is low compared to muddy or vegetated environments. This is due to the coarse grains and highly dynamic and stressful nature of the beach environment for many organisms, subject to wind and wave turbulence, salt spray, shifting sediment, high temperatures, and desiccation. The effect to vegetation and organisms could be temporary or long-term depending on the interval between landings and whether they take place in the same location or are dispersed to different lanes.

The LCAC, like other marine vessels, is potentially a vector via intracoastal dispersal of aquatic invasive or nuisance species, with travel between Camp Pendleton and the Silver Strand. This kind of dispersal has been recorded in northern California for dispersal among bays by vessels moving along the coast (CDFG 2006). The possibility of invasive species introduction increases with intracoastal movement of these craft, although a majority are stationed locally. As with all invasive species risk, individual activities carry an extremely small risk of invasive species introduction. Such risk accumulates with multiple activities but the vessels moving up and down the coast represent a small proportion of the total vessels in San Diego Bay, and so the increased risk, while present, may be discounted. In addition, the 2009 San Diego Bay INRMP, which follows along with federal and state priorities by identifying invasive species as one of the most important threats to aquatic ecosystems, proposes an interagency, baywide program to detect and control such invasions.

The effect of large, power-driven vessels on the oceanside beach lanes may be discounted due to the dispersed nature of the activity in areas of high-energy surf and expected low abundance of invertebrates. There is a potential effect present to eelgrass and associated invertebrate communities present bayside; however, it is restricted to small patches of eelgrass, bayside entries at low tide, and locations of repeated entry. Bayside beaching of large vessels is restricted to the designated training lane within Bravo area. Thus, adverse impacts are not considered likely under the No Action Alternative.

Marine vessel activities in the SSTC ROI would not measurably alter the water or sediment quality from debris or discharge sufficient to impact EFH. Adverse modifications to benthic habitat resulting in affects to EFH occur on limited bases during marine vessel landing activities within eelgrass habitat. The disturbance of eelgrass at this location will be mitigated through the NEMS, as discussed in Section 3.7.1.5.

#### 3.7.2.2.2 Underwater Detonations on the Sea Floor

Underwater detonations that take place under the No Action Alternative (Activities 5, 6, 7, 10, 11, 12, and 37, Table 2-1) are detailed in Table 3.7-9. All detonations occur in the oceanside training lanes within designated boat lanes 1-14. Detonations occur in water ranging in depth from 6 feet to 72 feet depending on the activity.

**Table 3.7-9: Underwater Explosive Activities Conducted during the No Action Alternative. All activities occur in the 14 oceanside training lanes.**

| Activity Number | Underwater Detonation | NEW[1] (lb) | Number of Detonations | Water Depth | Charge Depth | Tempo | Location |
|---|---|---|---|---|---|---|---|
| 5 | MCM[2] | 10 to 20 | 1/ op | ≤ 72 | Mid | 16 ops/yr | Boat Lanes 1 - 14 |
| 5 | MCM | 10 to 20 | 1/op | ≤ 72 | Bottom | 16 ops/yr | Boat Lanes 1 - 14 |
| 6 | Floating Mine | ≤ 5 | 1/op | ≤ 72 | Surface (< 5 feet) | 25 ops/yr | Boat Lanes 1 - 14 |
| 7 | Dive Platoon* | 3.5 | 8/op | 10 – 72 | Mid to Bottom | 8 ops/yr | Boat Lanes 1 - 14 |
| 9 | VSW MCM | 0.1 to 20 | 1/op | ≤ 24 | Bottom | 60 ops/yr | Boat Lanes 1 - 14 |
| 10 | UUV[3] Ops | 10 to 15 | 1/op | 10 ≤ 72 | Bottom to 10 feet from surface | 4 ops/yr | Boat Lanes 1 - 14 |
| 11 | MMS[4] Ops | 13 | 2/op | 10 ≤ 72 | Bottom | 8 ops/yr | Boat Lanes 1 - 14 |
| 11 | MMS Ops | 13 | 1/op | 24 ≤ 72 | Bottom to 20 feet from surface | 8 ops/yr | Boat Lanes 1 - 14 |
| 12 | Mine Neutral* | 3.5 | 8/op | 30 – 72 | Bottom | 4 ops/yr | Boat Lanes 1 - 14 |
| 37 | SDV/ASDS | < 10 | 1/op | ≤ 24 | Bottom-Mid | 14 ops/yr | Boat Lanes 1 - 14 |

Charges and are presented in terms of NEW in pounds.
[1]NEW: Net Explosive Weight; [2]MCM: Mine Counter Measures; [3] UUV: Unmanned Underwater Vehicle; [4] MMS: Marine Mammal Systems;
* Note - Unless otherwise specified, all sequential charges are conducted either less than 10-seconds apart or greater than 30-minute apart.

The habitat within the oceanside boat training lanes utilized for underwater detonations is primarily soft bottom sediment, with cobble or small patch, rocky reefs scattered throughout the area. Offshore depth within the ROI is less than 100 feet and macroalgae are generally considered ephemeral (last a very short time) within this area. Previous bathymetric and biological surveys document a physically disturbed area seasonally affected by wave action and longshore transport of sand. While invertebrate densities are poorly known, it is recognized that such densities are low in the sandy nearshore open environment compared to San Diego Bay locations and comparing soft and hard substrate.

For purposes of this analysis, only those detonations that are set on the sea floor are considered as potentially affecting marine plants, algae, or invertebrates, since marine invertebrates are concentrated in and on the bottom sediment. It is not known how much sediment is excavated by various blast sizes, so it is conservatively assumed that all sediment containing infauna in the blast zone is disturbed, and effects to invertebrates are discussed in relative terms. As a conservative estimate for this analysis, all detonations for any activity with a possible charge depth of "bottom" (Table 3.7-9) are considered bottom detonations. As such, it is assumed that up to 122 blast sequences (for an approximate total of 214 detonations) on the sea floor may occur per year within the oceanside boat lanes ranging from 3.5 to 20 pounds Net Explosive Weight (NEW), though a portion of these blast sequences are expected to be mid-water detonations.

Detonations on the oceanside of SSTC-N are most likely to be in unvegetated, soft substrate, given its predominance in the area proposed for this activity. Both free-floating and infaunal invertebrates that are closest to the blast could be killed. Invertebrates that have gas-filled organs and are close to the blast would experience injury or mortality due to blast pressure. The substrate and water column affected from a detonation near the bottom (about 78.5 square feet of direct impact per detonation, Geology and Soils, Section 3.2.3.2.3) is expected to recolonize, similarly to what is expected after a storm in an active, highly disturbed environment, or such as recovery in a boating channel that is routinely dredged. The impact of such disturbance would not be expected to cause catastrophic mortality or change community structure. Soule and Oguri (1976) looked at recolonization of infaunal species after dredging, compared to a reference site. Two to three years were required for the community to stabilize (Rhoads et al. 1978). A wide range of studies from many regions report a range of time to reestablish a stable community at between 1-1/2 and 12 years. Due to frequency of blasts (62/year bottom laid), these areas would be expected to recover their previous community structure. Plants and algae directly in the blast area would not likely return if the disturbance was repeated in the exact same location; however, blasts may or may not be repeated in the same location (except for blast sequences). The offshore boat lanes used for the detonation activities are expected to have relatively low background densities of invertebrates due to the dynamic and disturbed nature of the underwater environment from the action of waves, wind, and storms.

Assuming 78.5 square feet of impact, this amounts to a total area of 16,799 square feet of impacted area per year. Comparing this 16,799 square feet against the area of roughly fourteen training lanes typically used for underwater detonation training (14 lanes x 500 yards x 4000 yards x 9 square feet/square yard) =252,000,000 square feet, or about 5,785 acres, which translates into 0.00006 percent of the training area. Any localized effect on these areas would be masked by the effects of longshore transport and wave energy in this environment. Any localized effect on these areas would be masked by the effects of longshore transport and wave energy in this environment. Even the areas of hard substrate are largely composed of cobbles. Cobbles roll in this environment, continually disturbing the invertebrate community. Based on this analysis the effects to marine plants, algae, or invertebrates are considered inconsequential compared to background, natural disturbance conditions. Thus, adverse impacts are not considered likely under the No Action Alternative.

Underwater detonation activities in the SSTC ROI would not measurably alter the water or sediment quality from debris or discharge sufficient to impact EFH. Modifications to benthic habitat from detonations placed on the bottom occur infrequently and only within the SSTC ocean training lanes. Benthic habitat within the SSTC ocean training lanes is dominated by a physically dynamic sandy/cobble bottom that is both expansive and limited in EFH value. Thus, adverse impacts on EFH are not considered likely under the No Action Alternative.

#### 3.7.2.2.3 Amphibious and Beach Activities

Training encompassed in this section include amphibious activities and beach activities. Amphibious activities include the use of amphibious vehicles (AAVs and LARC Vs) and ELCAS training. Beach activities included in this analysis are fluid transfer activities, vehicle use, foot traffic and manual excavations. Training activities include the use of training areas within both San Diego Bay and the nearshore environment. Potential effects from these activities include vehicle transit within ROI waters, and habitat modification similar to those described above for Marine Vessel Activities.

### Amphibious Activities

Amphibious activities include amphibious vehicles such as AAVs, and Lighter, Amphibious, Resupply, Cargo-5 ton (LARC Vs) as well as amphibious elements of ELCAS activities. It also includes amphibious offloading of equipment (Activity 49, Maritime Prepositioning Ships Offload, Table 2-1) as well as pile driving associated with ELCAS (Activity 42, Table 2-1). Finally, these activities sometimes involve the use of bulldozers on the beach for floating pier assemblage (Activities 41 Causeway Pier Insertion and Retraction, 45 LCU/LCM Beaching, and 46 LCU/LCM Towing/Being Towed [Table 2-1]), or for insertion of the elevated causeway (Activity 42).

Amphibious vehicles in the ROI have similar effects to those mentioned above in the Marine Vessels section. While operating offshore and above the line of debris left by the most recent high-tide level (wrack line) they have minimal interaction with marine plants or invertebrates and so their effect is discountable. When vehicles are coming ashore, they can create tracks in the nearshore environment, causing temporary ruts to form with sediment compaction and possible localized mortality of infauna.

ELCAS activities involve the erection of a temporary pier or causeway utilizing floating barges and a pile driver to drive 24-inch diameter metal pilings to secure the barges in place. Most of the causeway remains floating offshore with pilings driven into the sediment. Associated activities involve accessing beach areas through the surf zone using floating and land-based heavy equipment, some of which may affect eelgrass habitat at the point of beach access. The ELCAS pier is normally 1200 feet in length with piles driven every 40 feet with the exception of the last causeway sections where additional support piles are utilized. The ELCAS pier is three pontoons wide with the exception of the last section which is nine pontoons wide with fenders. An ELCAS would most likely consist of 58 pier piles (29 per side), 29 pier head piles, and 16 pier head fender piles, for a total of 103 piles. Pier construction takes approximately 10 days, averaging 10 piles driven per day. It takes approximately 10 minutes to drive and set a pile before moving the driving equipment to the next location. Typically, one pile is driven every 2 hours. The driving and removal of piles to support the elevated causeway system disturbs sediment and eelgrass, as well as causes an increase in turbidity at the site of the pile driving. Pressure waves and sound generated from pile driving activities affect marine plants and animals within the immediate area and are most pronounced for burrowing infaunal invertebrates that are unable to move away from the affected area. There is a potential effect present to eelgrass and associated invertebrate communities present bayside. Since bayside ELCAS training is restricted to Bravo Beach, the disturbance of eelgrass at this location will be fully offset by mitigation through the NEMS, as discussed in Section 3.7.1.5. Considering the limited number of events that ELCAS takes place (four events per year distributed between the oceanside training lanes and Bravo Beach) in conjunction with relatively small areas of substrate that pile driving and pile removal affects (a few square meters at each location) compared to similar adjacent habitat, recolonization will also likely occur rapidly between ELCAS events.

Causeway activities occur primarily on SSTC-N oceanside boat training areas 1-10, but also periodically in the designated training lane within bayside training area Bravo. This activity occurs during nine separate training events per year, spanning eight to ten days per event under the No Action Alternative. Like the ELCAS, there is a potential effect present to eelgrass and associated invertebrate communities present in the bayside training area. Since bayside causeway training is restricted to Bravo Beach, the disturbance of eelgrass at this location will also be fully offset by mitigation through the NEMS, as discussed in Section 3.7.1.5.

Both bayside and oceanside locations are sandy in the intertidal area affected, and therefore contain low densities of invertebrates that could be disturbed by the onshore portion of the activity. The potential number of animals affected is low. Except for the locally disturbed substrate area, the site is expected to recolonize quickly from adjacent areas due to the prevalence of relatively short-lived, opportunistic, and mobile species in these sandy substrates. Sandy beaches remain aerobic and typically experience more turbulence from waves, preventing development of permanent burrows. The shoreline is a stressful environment, subject to wind and wave turbulence, salt spray, shifting sands, high temperatures, and desiccation. A number of plants and animals have become adapted to this instability and are found only on dunes or beaches. The fact that this exercise is performed relatively infrequently (nine times per year distributed between the oceanside and Bravo training areas), in effect minimizes the disturbance by allowing time for recolonization from adjacent sites that remain more intact. The overall impact to marine plants and invertebrates is minimal due to low densities and the small area of impact relative to the total beach area. Thus, adverse impacts are not considered likely under the No Action Alternative.

Amphibious and Beach activities in the SSTC ROI would not measurably alter the water or sediment quality from debris or discharge sufficient to impact EFH. Adverse modifications to benthic habitat resulting in affects to EFH occur on limited bases during amphibious landing and beach construction activities within eelgrass habitat. Amphibious landing and beach construction activities within eelgrass habitat are constrained to training lane Bravo and impacts to EFH are offset by replacement of affected eelgrass habitat addressed in Section 3.7.1.5.

### Beach Activities

While beach activities take place almost entirely out of the water on the training beaches, components of the activities may still represent a potential effect to marine communities in the nearshore area (classified as surf zone and coastal pelagic zone up to 100 miles westward as described by Allen et al. (2006) and others), or in areas below the high tide line. Beach activities may take place on the hard pack sand between the high and low tide line if the tide is out. Activities above the wrack line are also analyzed in Section 3.11, Terrestrial Biological Resources.

#### *Fluid Transfer*

Fluid transfer training events involve the intake of seawater and the discharge of water back into San Diego Bay. Fluid transfer activities consist of transferring salt water to simulate fuel transfer, under the activity Offshore Petroleum Discharge System (OPDS), Amphibious Bulk Liquid Transfer System (ABLTS), and bringing saltwater ashore for desalinization, under the activity Reverse Osmosis Water Purification Unit (ROWPU) (Activities 38, 39, and 50, respectively, Table 2-1).

During an OPDS activity, a fuel transport conduit is towed offshore from a beach termination unit (BTU). Water is pumped to a beach interface unit to simulate fueling and then returned to the ocean with a hose. This activity occurs six times per year under the No Action Alternative. During an ABLTS activity salt water is pumped ashore from a floating hose extending up to 10,000 feet offshore. The water is pumped into a beach interface unit and then returned to the ocean with a hose. This activity occurs four times per year for 15 days per training event under the No Action Alternative. During ROWPU training, salt water is brought ashore and desalinized. Hypersaline water is then typically stored in a bladder and transported offsite for sewerage. ROWPU occurs four times per year under the No Action Alternative.

The conduit is expected to have discountable effects on marine plants and invertebrates. Since these activities take place in the nearshore ocean where substrate disturbance is naturally high and invertebrate densities are low, the temporary and localized effect of these activities compared to the available beach and sea floor is expected to be minimal. This is because the difference between any effect and the background condition, which is already a high-disturbance environment, would not be distinguishable. Thus, adverse impacts on marine plants, algae, invertebrates, or EFH are not considered likely under the No Action Alternative.

### *Vehicle Use*

Vehicle use under the No Action Alternative consists of safety and logistical vehicles, bulldozers, four-wheel drive vehicle training, and amphibious vehicles on the shore. Bulldozers are used to grade the beach, excavate sand, recreate hummocks, and push beached vessels that are stuck back into the water. Cranes are used to move equipment and boxes around. During MPF offload/Roll On Roll Off Discharge Facility (RRDF) activities (49 and 51, Table 2-1), all types of equipment including LARC Vs can be offloaded, set up, and operated on the beach. Vehicle use is common to most of the exercises that occur on SSTC; even exercises that do not otherwise access the shore require onshore vehicles that monitor for safety and logistical reasons. This activity consists of vehicles driving or sitting stationary on the beach from the best vantage point, and out of the way of other beach activities. If they are observing or supporting offshore activities they may transit along the beach crest or on the hard pack sand between the crest and high tide line. Vehicle use occurs throughout the beach zone including below the high tide line and in the intertidal zone where marine invertebrates occur at their greatest density.

Vehicle patrolling (Activity 53, Table 2-1) occurs approximately six times per year under the No Action Alternative in during LARC V Operator Training. In this activity operators learn to drive the LARC V on- and offshore. The only impact these activities would have on marine plants or invertebrates would be sediment disturbance caused by temporary rutting of the beach below the high tide line. However, all such disturbances would be highly localized and short term, given the highly variable intertidal environment, and would not have any lasting effects on plants or invertebrates. Thus, adverse impacts are not considered likely under the No Action Alternative.

Driving and parking vehicles in the intertidal area affects invertebrates by direct impact or by crushing of burrows if the tide is out. However, the effect is small and not quantifiable because invertebrate biomass is low in a sandy environment due to instability of the sediments and extreme gradients of desiccation. They recolonize quickly because that is what they are adapted to do in a shifting environment; for instance, invertebrate beach dwellers tend to be very fast burrowers in the surf zone (Little 2000). Burrows such as of sand crabs and lugworms cannot maintain themselves in the coarse, non-cohesive sands in the upper beach area, while in the lower beach area where sediments are finer, infauna is more abundant.

Vehicle travel is a recognized means of spreading aquatic invasive species (CDFG 2006); however, beach vehicles are expected to be generally locally based and not traverse between aquatic environments. Most aquatic invasive species, in addition, do not thrive in the stressful beach environment.

### *Foot Traffic*

Concentrated foot traffic has the highest potential for effect during activities on rock jetties, where marine plants and invertebrates are expected to be relatively more abundant than on soft sediments. Activities use nonmotorized boats which the students portage over both the Zuniga and Coronado rock jetties (Activity 57, 71, 73, Table 2-1), potentially affecting marine invertebrates encrusting these rock formations. These activities can include up to 60 students in five to seven groups traversing the rocks with boats while heading to and from shore. However, the overall effect on marine invertebrates in an area dominated by tidal fluctuation and wave action, from these activities is low and, if present, temporary, and discountable. Thus, adverse impacts are not considered likely under the No Action Alternative.

### 3.7.2.3 Alternative 1 (Preferred Alternative)

Alternative 1 increases the current level and types of training that occur in the ROI. Current management of marine plants and invertebrates would remain unchanged. This section focuses on groups of activities that have the potential to result in an impact to marine plants or invertebrates. As discussed previously, similar types of activities are grouped together to facilitate the analysis.

#### 3.7.2.3.1 Marine Vessel Activities

Power-driven vessel use would increase under Alternative 1 as presented in Chapter 2, both in large and small vessels, detailed in Appendix B. Seven new activities involving marine vessels would be added under Alternative 1 (N1, N2, N3, N4, N6, N7 and N9, Table 2-2). The total number of vessels varies per activity, but multiplying the number of vessels by the number of events in which they are used, and summing over all the activities, results in an approximate number of 12,800 vessels used per year, over 10,100 under the No Action Alternative (Appendix C). Assuming training occurs only on weekdays, the average number of marine vessels utilizing the ROI per weekday would be 49 vessels performing varying activities. The greatest increases to marine vessel activities would be attributed to new activities: Shock Wave Generator (SWAG) Surf Zone Test Detachment (Activities N1 and N2, respectively, Table 2-2), and towed Organic Airborne Mine Countermeasures (OAMCM) systems (Activities N4, N6, N7, Table 2-2), as well as increases to existing activities (SDV/ASDS Cert training and Barge Ferry/Causeway Coxswain training [Activities 37 and 40, respectively, Table 2-1]).

The proposed increase in the use of propeller-driven craft would result in a proportional increase in potential impacts to eelgrass and marine algae beds in the San Diego Bay waters as well as during activities when beaching occurs at low tide in San Diego Bay. This is a small proportion of overall marine vessel activity. Given that the potential footprint of repeated or more than temporary impact is small and localized within the designated training lane within Bravo beach, minimally disturbed eelgrass in other areas would recover quickly and would most likely suffer no long-term loss of net production. Therefore, this impact would be considered negligible. Marine vessel activities in the SSTC ROI would not measurably alter the water or sediment quality from debris or discharge sufficient to impact EFH. Adverse modifications to benthic habitat resulting in affects to EFH occur on limited bases during marine vessel landing activities within eelgrass habitat. The disturbance of eelgrass at this location will be mitigated through the NEMS, as discussed in Section 3.7.1.5.

The potential for invasive aquatic species introduction would increase with increased use of marine vessels, both because of their movement to and from potentially infested areas, and due to hull fouling in the harbor. The vessel increase, however, still represents a small fraction of overall vessel movement in San Diego Bay, and the increased risk is considered negligible.

The presence of additional vessels in the San Diego Bay may also result in an increased loss of abundance and diversity of marine plants and invertebrates. The reasons for the correlation between boat numbers and the loss of invertebrate fauna species are not documented well, but could relate to the use of biocidal paints as an antifouling agent in harbors, other water quality issues, and general disturbance of these areas. Of the overall increase in vessel use under Alternative 1, there would be a small increase in actual vessels used in the San Diego Bay and so the increased potential for impacts in the San Diego Bay would be considered negligible.

Under Alternative 1, mine neutralization activities can involve an array of equipment including UUVs, lasers, divers, and helicopters towing surface sleds and submerged equipment through simulated threat minefields with the goal of clearing a safe channel through the minefield for the passage of friendly ships. Using a variety of external OAMCM systems, the MH-60S crew searches for mines and mine-like shapes, detects and identifies them, then neutralizes them. These systems include the AN/AQS-20A Advance MCM Sonar, the AN/ALQ-220 OASIS mine sweeping system, and the Airborne Mine Neutralization System (AMNS, N4, N6, and N7, Table 2-2). All activities would be conducted in the SSTC oceanside boat lanes at depths greater than 40 feet.

The potential impacts of OAMCM systems on marine plants and invertebrates would primarily be associated with the expenditure of ordnance near or on the bottom and incidental release of other materials in exercises that would be conducted at SSTC oceanside in the 14 boat lanes. The resulting debris and/or discharges may affect the physical and chemical properties of benthic habitats and the quality of surrounding marine waters, in turn affecting populations of marine plants and invertebrates. The analysis of water quality effects associated with OAMCM systems is provided in Section 3.5, Water Resources, and indicates that effects from mine neutralization activities to water quality are anticipated to be minimal. The effect of small towed underwater vessels on the invertebrate and marine plant community in the oceanside boat lanes would be minimal due to the dispersed nature of the activity and expected low abundance of invertebrates and plants in the water column.

#### 3.7.2.3.2 Mine Neutralization Training Area

In support of the mine neutralization activities described above, Alternative 1 would include the installation of a mine neutralization training area in the boat lanes of SSTC. This would consist of a relatively small training minefield for use with AN/AQS-20A, OASIS, ALMDS, and AMNS activities. There would be approximately 15 mine shapes, both moored and bottom shapes, lowered into place by boat in the water of 40 to 75 feet in depth in oceanside waters of SSTC. Concrete anchors would hold the mine shapes in place, one for each mine shape. Each anchor would measure 2.0 to 2.5 feet on each side, between 8 and 15 square feet per anchor, which represents a total area of effect from concrete anchors of 234 square feet, which represents less than 0.0001 percent of available benthic habitat in the SSTC boat lanes. Sediment disturbance possibly affecting benthic invertebrates would occur during anchor placement and could recur with subsequent anchor maintenance activities or during mine shape deployment or recovery. However, all such disturbances would be highly localized and short term, and would not have any lasting effects on bathymetry or sediments. Thus, adverse impacts to marine plants, algae, invertebrates or EFH are not considered likely under Alternative 1.

#### 3.7.2.3.3 Underwater Detonations

All underwater detonation training activities occur on the ocean side of SSTC within the designated boat lanes, with the exception of small charge weight (0.033 lb) Shock Wave Action Generator (SWAG) within the open waters of south San Diego Bay. In general: 78% of the annual SSTC underwater detonations include underwater charges of less than 10lbs. NEW. Underwater detonations that would take place under Alternative 1 would increase from 103 activities under the No Action Alternative to 311 activities under Alternative 1. Under Alternative 1, five additional activities (Table 2-3) would be conducted: SWAG (N1) and Unmanned Underwater Vehicle (UUV Neutralization (N3), AMNS (N7), Demolition Requalification and Training/Underwater Detonations (N9), and NSW Underwater Demolition Training (N11) and the footprint of activities would be expanded to include SWAG detonations of up to 15 grams NEW within San Diego Bay.

The proposed increase in detonation frequency from the No Action Alternative would include the addition of the SWAG detonations in both the bayside and oceanside boat lanes. The proposed bayside training lane, Echo, is an area fluctuating between approximately 10 to 20 feet in depth depending on the tide. The detonations affect a small area in San Diego Bay. The area affected by the blast is small, approximately equivalent to a small firecracker, with low blast pressure at the source (thus usable by divers). Only invertebrates suspended in the water column and in immediate proximity would be directly affected. The effect on marine plant, algae, and invertebrates would be negligible.

Mine neutralization activities involving OAMCM systems would be conducted in the SSTC oceanside boat lanes at depths greater than 40 feet. AMNS use would result in the deployment of a neutralizer, which is detonated in only 20 percent of AMNS activities (Table 3.7-10). Similar to the No Action Alternative, only those detonations that are set on the sea floor are considered to potentially affect marine plants, algae, or invertebrates, since marine invertebrates are concentrated in and on the bottom sediment.

The total area of marine substrate potentially affected from all underwater detonations in the oceanside boat lanes for Alternative 1 would be approximately .055 acres in the ocean boat lanes, which is approximately 0.00009 percent of the available boat lane training area. This is an estimated increase of 41 percent in area impacted by activities due to the increase of detonations on the bottom (214 to 297), in frequency of several activities, and of new detonations from UUV Neutralization and AMNS (Activities N3 and N7, Table 2-2). Plants and algae attached to bottom substrate in the immediate vicinity of a detonation (approximately 75 square feet) would likely be directly impacted. Because the expected densities of invertebrates in this dynamic ocean environment are low, the combination of the small area surrounding the blast site that is directly affected and short recovery times for invertebrates mean the area would be expected to recolonize following underwater detonations, starting with pioneer types of invertebrates. The increased detonations on the oceanside of SSTC-N under Alternative 1 are more likely to affect free-floating and infaunal invertebrates; however, due to low densities and short recovery times, this difference is also negligible and the effects to marine plants and invertebrates and EFH would be similar to that described under the No Action Alternative.

### 3.7.2.3.4 Amphibious and Beach Activities

#### Amphibious Activities

Alternative 1 adds three more ELCAS activities and one more causeway insertion at the same locations as the No Action Alternative. As described in Section 3.7.2.2.3, the potential number of animals affected is low. The ELCAS and causeway insertion sites are expected to recolonize quickly from adjacent areas. The fact that this exercise is consistently done at the same location at Bravo Beach minimizes the disturbance by allowing for better recolonization from adjacent sites. The overall impact to marine plants and invertebrates is minimal and the impact from the addition of three ELCAS activities and one causeway activity would be considered negligible. Impacts to eelgrass in the designated training lane within Bravo Beach would be mitigated through the NEMS, as discussed in Section 3.7.1.5.

#### Beach Activities

*Fluid Transfer*

Fluid transfer activities increase 15 events per year under Alternative 1. Potential effects to marine resources would be the same as those described under the No Action Alternative.

*Vehicle Use*

In addition to an increase in safety and logistical vehicle use under Alternative 1, vehicle patrolling is added to the ROI. Vehicle patrolling takes place on SSTC-N about 50 times per year during a single exercise under Alternative 1. It would involve vehicles driving along the hard pack and soft pack sand patrolling the beach in directions determined by the trainees so that they can learn to drive and operate the vehicles in varying terrain. It is limited to SSTC-N beach lanes Yellow 1 and 2 and Green 1 and 2. Vehicle use is conservatively estimated to impact about half of the available beach lanes over the course of the year.

**Table 3.7-10: Underwater Explosive Activities Conducted during Alternatives 1 and 2.**

| Activity Number | Underwater Detonation Operation | NEW[1] (pounds) | Number of Detonations | Water Depth (feet) | Charge Depth | Tempo | Location |
|---|---|---|---|---|---|---|---|
| 5 | MCM[2] | 10 to 20 | 1/operation (op) | ≤ 72 | Mid | 29 ops/yr | Boat Lanes 1 - 14 |
| 5 | MCM | 10 to 20 | 1/op | ≤ 72 | Bottom | 29 ops/yr | Boat Lanes 1 - 14 |
| 6 | Floating Mine | ≤ 5 | 1/op | ≤ 72 | Surface (< 5 feet) | 53 ops/yr | Boat Lanes 1 - 14 |
| 7 | Dive Platoon* | 3.5 | 8/op | 30 – 72 | Bottom | 8 ops/yr | Boat Lanes 1 - 14 |
| 9 | VSW MCM | 0.1 to 20 | 1/op | ≤ 24 | Bottom | 60 ops/yr | Boat Lanes 1 - 14 |
| 10 | UUV[3] Ops | 10 to 15 | 1/op | 10 ≤ 72 | Bottom to 10 feet from surface | 4 ops/yr | Boat Lanes 1 - 14 |
| 11 | MMS[4] Ops | 13 & 29 | 2/op | 10 ≤ 72 | Bottom | 8 ops/yr | Boat Lanes 1 - 14 |
| 11 | MMS Ops | 13 & 29 | 1/op | 24 ≤ 72 | Bottom to 20 feet from surface | 8 ops/yr | Boat Lanes 1 - 14 |
| 12 | Mine Neutral* | 3.5 | 8/op | 30 – 72 | Bottom | 4 ops/yr | Boat Lanes 1 - 14 |
| N1 | SWAG | 15 grams | 1/op | 10 – 20 | Mid | 74 ops/yr | Echo |
| N1 | SWAG | 15 grams | 1/op | 10 – 20 | Mid | 16 ops/yr | Boat Lanes 1 - 14 |
| N2 | Surf Zone T&E | Up to 20 | 1/op | ≤ 24 | Bottom | 2 ops/yr | Boat Lanes 1 - 14 |
| N3 | UUV Neutral | 3.3 & 3.57 | 2/op | 10 – 72 | Bottom to 10 feet from surface | 4 ops/yr | Boat Lanes 1 - 14 |
| N7 | AMNS | 3.53 | 1/op | 40 – 72 | Mid – Bottom | 10 ops/yr | Boat Lanes 1 - 14 |
| N9 | Qual/Cert[5] | 12.5 – 13.75 | 2/op | 10 – 72 | Bottom | 8 ops/yr | Boat Lanes 1 - 14 |
| N9 | Qual/Cert | 25.5 | 1/op | 40 – 72 | Bottom to 20 feet from surface | 4 ops/yr | Boat Lanes 1 - 14 |
| N11 | NSW DemoTraining | ≤ 10 | 1/op | ≤ 24 | Bottom | 4 ops/yr | Boat Lanes 1 - 14 |
| N11 | NSW Demo Training | ≤ 3.6 | 1/op | ≤ 24 | Surface | 8 ops/yr | Boat Lanes 1 - 14 |
| 37 | SDV/ASDS | ≤ 10 | 1/op | ≤ 24 | Bottom-Mid | 40 ops/yr | Boat Lanes 1 - 14 |

[1]NEW: Net Explosive Weight. [2] MCM: Mine Counter Measures, [3] UUV: Unmanned Underwater Vehicle, [4] MMS: Marine Mammal Systems, [5] Qual/Cert: Qualification or Certification trials,
* Sequential charges are either conducted with a 10 sec delay between detonations or 30 minute delay between detonations.

The expected increase in driving and parking vehicles on the beach and its effect on marine plant and invertebrate populations is not quantifiable compared to the No Action Alternative. The effect is small because only a small proportion of the vehicle use would occur below the beach crest and in the intertidal zone where invertebrates concentrate and because invertebrate densities in this sandy environment are low. They would recolonize quickly due to short life spans and rapid population turnover. The confinement of vehicle patrolling to Yellow and Green lanes, and the low percentage of time this activity would occur below the beach crest, reduces its effect on marine invertebrates.

*Foot Traffic*

As described previously, concentrated foot traffic has the highest potential for effect during activities on rock jetties, where marine plants and invertebrates are expected to be relatively more abundant than on soft sediments. While there is a slight increase in activities under Alternative 1, the overall effect on marine invertebrates in an area dominated by tidal fluctuation and wave action, would remain low and, if present, temporary, and discountable.

#### 3.7.2.4 Alternative 2

Implementation of Alternative 2 would increase the training tempo to the same levels as those proposed for Alternative 1. The only difference between Alternative 1 and 2 is that, under Alternative 2, all SSTC-N oceanside beach training areas would be available for Navy training, regardless of time of year. Therefore, the minimal impacts associated with Alternative 2 would be the same as those described above for Alternative 1, though minimally dispersed across a larger area on the oceanside of SSTC-N due to the lack of training area restrictions.

### 3.7.3 Proposed Mitigation Measures

To mitigate for potential impacts of large vessel beaching, causeway insertion, and ELCAS construction to eelgrass in the designated training lane within Bravo Beach, the Navy will mitigate for potential eelgrass habitat occurring in this lane.

Figure 3.7-10 shows the extent of eelgrass in the designated training lane within Bravo Beach as surveyed in 1994, 1999, 2004, and 2008. The variation in extent of eelgrass between these surveys could be due to artifacts of mapping or environmental conditions that effect eelgrass growth. The 1999 survey indicates that the maximum extent of potential eelgrass habitat in this designated training lane is 1.13 acres. While SSTC training may not actually impact all of the eelgrass habitat in the designated training lane within Bravo Beach, the Navy plans to mitigate for this the full extent of eelgrass habitat occurring in this lane, 1.13 acres. Mitigation would be done through the Navy's Eelgrass Mitigation Bank. Mitigation would occur consistent with the Southern California Eelgrass Mitigation Policy.

As a result of consultation with the NMFS for EFH, the Navy will conduct a new bottom habitat mapping survey to more accurately detail potential habitat types (ex., sand, cobble, rocks) within the oceanside SSTC boat lanes. This effort, scheduled to begin in 2011, is designed to update bottom type classification at finer resolution and spatial scales than previous California State funded surveys from 2002. The goal from this Navy funded survey would be to provide information to NMFS on habitat types within SSTC, and to Navy commands conducting underwater detonations at SSTC for consideration in selection of appropriate bottom-laid detonation sites.

### 3.7.4 Unavoidable Adverse Environmental Effects

There are no unavoidable adverse environmental effects to marine resources as a result of implementation of any of the alternatives.

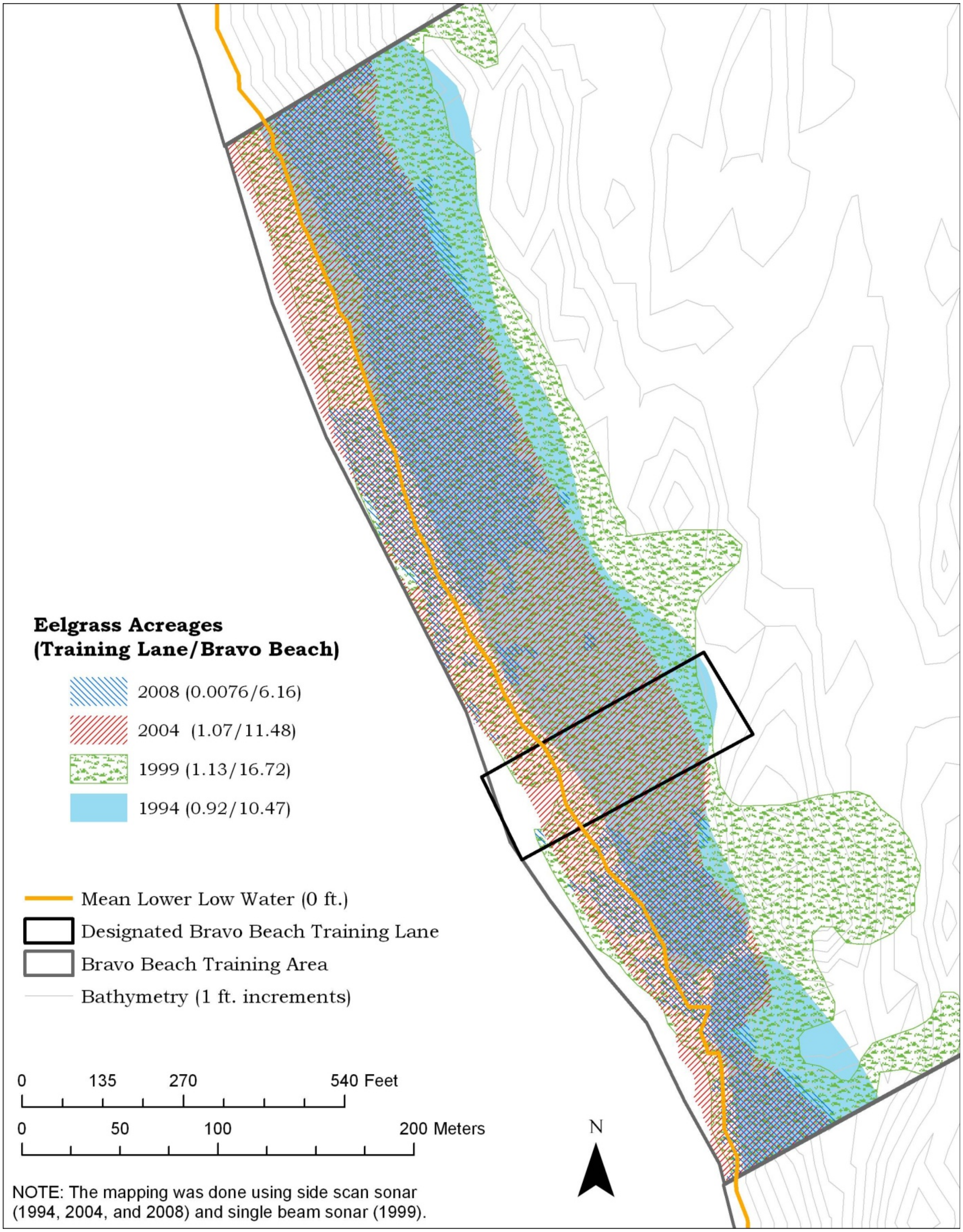



**Figure 3.7-10: Eelgrass Mapping from Four Separate Bay-wide Surveys in 1994, 1999, 2004, and 2008 Focusing on the Bravo Training Area Where ELCAS, Causeway, and Large Vessel Beaching Occur**

### 3.7.5 Summary of Effects

The summary of effects is the same as that described above for unavoidable effects (Table 3.7-11).

All alternatives avoid effects on marine algae, plants, and invertebrates in areas where densities of these organisms are the greatest: the salt marsh, mudflats, and salt pond.

The EFHA concludes that based on the extent, duration, and magnitude of potential impacts from SSTC training and testing, that there could be an adverse impact of up to 1.13 acres (0.46 hectares) of eelgrass habitat in San Diego Bay. The Navy currently maintains a signed agreement with the Army Corps of Engineers and NOAA Fisheries (i.e., Banking Instrument; N00242-080624-X42-MOA; DoN 2008) to mitigate or compensate impacts to eelgrass habitat, and any impacts to eelgrass within the designated training lane within Bravo training area will be offset by the NEMS.

Adverse effects to EFH from underwater detonations and certain select beach activities would be temporary, localized, and minimal, there would be no lasting effects to populations, prey availability, or the food web. Any potential effects would be further reduced with the proposed protective measures including bottom mapping of sensitive habitat. Therefore no adverse effect to EFH for the four major FMPs and their associated managed species are anticipated.

A full description of the EFHA consultation process is provided in Chapter 6 and Appendix G provides a list of the Silver Strand Training Complex (SSTC) EFHA consultation documentation. Agency correspondence and supporting documentation can be found on the SSTC EIS website at www.silverstrandtrainingcomplexeis.com.

**Table 3.7-11: Summary of Effects**

| Alternative | Effects |
|---|---|
| **No Action Alternative** | • On the beach, vehicle use, boat landings, helicopter landings, and foot traffic associated with a range of activities could cause temporary localized disturbances of infaunal invertebrates of the sand.<br>• Minimal disturbance of sandy bottom habitat and increased turbidity from amphibious landings and underwater demolitions.<br>• A total of 1.13 acres of eelgrass habitat may be impacted in the designated training lane within the Bravo training area.<br>• With the current protective measures, no adverse effect to EFH and their associated managed species are anticipated during amphibious landing and beach construction activities within the Bravo training area. |
| **Alternative 1** | • Vehicle, boat, and helicopter use and amphibious landings would increase; however, effects generally are the same as described for the No Action Alternative. Amphibious activities conducted on the bayside would be limited to the same designated training lane within the Bravo training area.<br>• With the current and proposed protective measures, no adverse effect to EFH and their associated managed species are anticipated during amphibious landing and beach construction activities within the Bravo training area. |
| **Alternative 2** | • Vehicle, boat, and helicopter use and amphibious landings would increase similar to Alternative 1. Effects generally are the same as described for the No Action Alternative.<br>• With the current and proposed protective measures, no adverse effect to EFH and their associated managed species are anticipated during amphibious landing and beach construction activities within the Bravo training area. |
| **Mitigation Measures** | • Management practices are in place for jurisdictional waters and special aquatic sites. Additionally, the Navy has consulted with NMFS on EFH. Potential impacts of up to 1.13 acres of eelgrass habitat/EFH for larger boat landings, ELCAS, and causeway insertions in the designated training lane on Bravo Beach will be mitigated consistent with the Southern California Eelgrass Mitigation Policy. This mitigation will occur at an established NEMS and be drawn as part of the Navy Eelgrass Mitigation Bank.<br>• Navy will conduct a new bottom habitat mapping survey to more accurately detail potential habitat types (ex., sand, cobble, rocks) within the oceanside SSTC boat lanes. This effort, scheduled to begin in 2011, is designed to update bottom type classification at finer resolution and spatial scales than previous California State funded surveys from 2002. The goal from this Navy funded survey would be to provide information to NMFS on habitat types within SSTC, and to Navy commands conducting underwater detonations at SSTC for consideration in selection of appropriate bottom-laid detonation sites. |

# 3.8 Fish

# 3.8 FISH

## 3.8.1 Affected Environment

### 3.8.1.1 Introduction

#### 3.8.1.1.1 Definition

This section describes the fish and fish assemblages expected to be present in the Silver Strand Training Complex (SSTC) area that potentially could be affected by the Proposed Action. The potential effects are analyzed and a discussion is presented concerning current management and mitigation practices.

#### 3.8.1.1.2 Regional Setting

The offshore area is part of the Pacific Ocean region referred to as the Southern California Bight (SCB), and is directly affected by two ocean currents. The colder, northern California Current and the southern, warm-water Davidson Current influences the ocean within the SCB. These two currents mix in the Santa Barbara Channel. The water within the southern portion of the SCB is warmer and more saline than the water within the northern area (Hickey 1993). These differing conditions—as well as upwelling of cooler, nutrient-rich waters—influence the unusually diverse marine biota within the SCB region (Murray and Littler 1981).

In the coastal zone and waters of San Diego Bay, biological conditions mirror that of other southern California coastal bays and estuaries. San Diego Bay is located in an arid region of Mediterranean climate and is fed by small, seasonal rivers and streams. As a result, the fish assemblages are largely devoid of freshwater and anadromous species, and are dominated by estuarine resident and marine migrant fish (Allen et al. 2006 and VRG 2009). Unlike the majority of southern California bays and estuaries, San Diego Bay is comparatively large and displays considerable habitat diversity and develops environmental gradients, especially during the winter months when most rainfall occurs. The offshore portion of SSTC is adjacent to the mouth of San Diego Bay and is comprised of primarily sandy soft-bottom surf zone habitat, interspersed with low relief rocky cobble habitat within the coastal pelagic zone out to 328 feet.

The SSTC and San Diego Bay are situated within an urban area, where there is intense shore and water use—both current and historical. In proximity to a large Naval complex and California's second largest city, San Diego Bay receives waters and urban runoff from a watershed of 415 square miles, where 50 percent of the county's population lives or works. The legacy of historic dredging, filling, direct sewage delivery, and pollutants that still persist have modified the benthic environment that supports marine plants and invertebrates vital to the fish species during multiple life stages; thus, biological assemblages have changed in comparison to past marine communities. Due to this history and identified pollutants, San Diego Bay is listed as an impaired water body under Clean Water Act (CWA) Section 303[d] by the California State Water Resources Control Board (Regional Water Quality Control Board 2007). These pollutants influence the population dynamics of invertebrates living in San Diego Bay sediments. An added pressure on the marine communities is the depletion and modification of the habitats in the Region of Influence (ROI) from historic conditions. Compared to historic acreages, there has been a 70 percent loss of salt marsh, 84 percent loss of intertidal areas other than salt marsh, and a 42 percent loss of shallow subtidal waters. Conversely, since the San Diego Bay was first dredged in 1914, deep-water habitat has doubled. Also, available shoreline habitats have experienced physical alteration, with 74 percent of the shoreline now armored with artificial hard structures—a type of substrate not native to the ROI. Fresh water and sediment formerly delivered to the San Diego Bay by several rivers and creeks are now almost completely impounded by dams and replaced by storm water flows.

#### 3.8.1.1.3 Region of Influence

The marine ROI can be partitioned into three zones: the bayside training zones within the San Diego Bay (sandy beaches, mudflats, and the nearshore environment); portions of the intertidal to nearshore (<0.5

nautical mile [nm]) ocean area off the southern beaches of Naval Air Station, North Island (NASNI); and the intertidal to nearshore (<3 nm) ocean area encompassing the training lanes at SSTC-North (SSTC-N) and SSTC-South (SSTC-S), and ocean anchorages. Fish species that occur in this area for any portion of their life cycle are discussed in this chapter.

### 3.8.1.2 Marine Fish Habitat

The aquatic marine environment within the ROI supports diverse fish assemblages that reflect the great variety of aquatic habitats that are available to fish. Aquatic habitat delineation is discussed in Section 3.7. This section describes what is known about fish populations in the ROI and functions performed by the waters of the ROI to support fish productivity. Within the aquatic portion of the ROI—waters below mean higher high water—a wide variety of fish habitat types are represented. Fish habitat is described in terms of depth and substrate (Allen et al. 2006 and VRG 2009); the type and amount of ecological information on fish are not equable among habitats or among species. What is known about fish habitat reflects various investigator interest, sampling logistics, and economic and political considerations.

Fish habitat types previously used to describe waters within the ROI are divided into those within San Diego Bay and those within coastal nearshore waters adjacent to the San Diego Bay, out to a depth of approximately 600 feet. San Diego Bay fish habitat types are segregated by depth (intertidal, shallow subtidal, moderately deep subtidal, and deep channel, Table 3.8-1), vegetation (vegetated versus unvegetated) and substrate (soft bottom, mudflat, rip rap, rocky reef) (Horn 1980; Horn and Allen 1981; Allen 1985, 1997, 2006, and VRG 2009) as previously presented in Section 3.7. The majority of this literature regarding fish habitat places San Diego Bay into a single category: bays and estuaries. Bays and estuaries of Southern California give way to smaller embayments where freshwater input is largely restricted to the winter months when rainfall is most prevalent.

**Table 3.8-1: Submerged Habitat Types Based on Bathymetry within the San Diego Bay and SSTC Bay Training Areas**

| Habitat | Depth (ft – MLLW[1]) | San Diego Bay (acres) | SSTC ROI (acres) |
|---|---|---|---|
| Salt Marsh[2] | > +2 | 823 | - |
| Intertidal (excluding salt marsh) | +2 to -2 | 1,802 | 32 |
| Salt Ponds | > +2.0 | 1,608 | - |
| Shallow | -2 to -12 | 4,799 | 846 |
| Moderately Deep | -12 to -20 | 2,219 | 983 |
| Deep | < -20 | 4,443 | 22 |
| **Total** | | **15,694** | **1,883** |

[1] Mean Lower Low Water
2 The salt marsh habitat is described in detail in Sections 3.7.1.3.1 and 3.11.1.2.

Near-coastal fish habitat is partitioned similarly into defined substrate and depth criteria; and it includes surf zone, coastal pelagic zone, and continental shelf representing soft substrata and rocky intertidal, rocky reefs, kelp beds, and deep rocky habitats representing hard substrata (Allen et al. 2006 and VRG 2009). Individual fish species are classified within specific habitat types, but realistically the majority of fish known to occur within the ROI transit between or through multiple habitats during some portion of their life or life stage. Several fish species documented to occur within the ROI make seasonal or diurnal movements through multiple habitat types when aggregating, foraging, and/or spawning. Estuarine and marine habitats within the ROI vary by depth (bathymetry), tidal inundation, bottom substrate, and whether they are vegetated or unvegetated as previously presented in Section 3.7. Figure 3.7-1 depicts tidal elevation of the habitats described in Section 3.7 and this section, and Table 3.8-1 shows the acreage of submerged habitat types and their respective depths below mean lower low water (MLLW) in the San Diego Bay and within the SSTC ROI. Figure 3.7-3 provides an overview of marine habitats based on vegetation and substrate within the ROI, and Figure 3.7-4 focuses on the SSTC Bay training areas.

#### 3.8.1.2.1 Intertidal Zone

Intertidal areas in the ROI are between the high and low tide line, and are subject to varying degrees of tidal submergence. There are several subareas of intertidal habitat based on the dominant substrate type and associated biological communities. The intertidal zone is a highly dynamic area because of its variable exposure to air, extreme temperature fluctuations, and utilization by both aquatic and terrestrial organisms. Fish species residing or utilizing the intertidal zone must adapt to unique, extreme physical and biological conditions. The intertidal zone within the ROI contains several fish habitat types further described within this section.

##### Southern Coastal Salt Marsh

Southern coastal salt marsh is a unique and important habitat within San Diego Bay (Section 3.7.1.3.1 and 3.11.1.2). Fish use the areas of salt marsh still exposed to the tide when the tide is in, taking advantage of the abundant food resources. Topsmelt (*Atherinops affinis*), arrow goby (*Clevelandia ios*), California killifish (*Fundulus parvipinnis*), and longjaw mudsucker (*Gillichthys mirabilis*) are all expected in salt marshes, due to their prevalence at the Sweetwater Marsh (Johnson 1999). Young round stingray (*Urobatus halleri*) and California halibut (*Paralichthys californicus*) are expected during curtain times of the year as well.

##### Intertidal Habitat

As presented in Section 3.7.1.3.1, intertidal habitat of the San Diego Bay includes salt marshes, mudflats, sand flats and salt flats, and portions of artificial hard substrate that provide valuable habitat for a variety of flora and fauna.When the tide comes in, numerous fish, sharks, and rays move in to forage in the flats. While most common intertidal fish are tidal visitors, some remain at low tide in shallow drainage channels or are species that can live in the burrows of marine invertebrates (Moyle and Cech 1982). Resident intertidal fish include the California killfish, longjaw mudsucker and the arrow goby. Other fish common in intertidal habitats include estuarine resident fish such as bay pipefish (*Syngnathus leptorhynchus*), deepbody anchovy (*Anchoa compressa*), and spotted sand bass (*Paralabrax maculatofasciatus*). Additionally, marine migrant fish, either diurnal or seasonal visitors, California halibut, shiner perch (*Cymatogaster aggregata*), round stingray, and others make up the remainder of the fish species commonly found utilizing intertidal habitat.

Surf zone and sand flat fish habitat is constrained to the ocean portion of the ROI. The fish associated with intertidal surf zone/sand flat habitat live in a turbulent environment described as exposed coastal beaches. The turbulence and currents associated with intertidal sand flat habitat require high-energy expenditures by fish that live there; but turbulence provides a constant source of small, disoriented invertebrates that are exceptionally vulnerable to capture by fish. Common fish to intertidal areas of exposed coastal beaches are made up of a diverse group of fish including active plankton feeders :northern anchovy (*Engraulis mordax*); roving substrate feeders – California corbina (*Menticirrhus undulates*); flatfish – California halibut; migratory species – White seabass (*Atractoscion nobilis*); beach spawners – California grunion (*Leuresthes tenuis*); and piscovores – leopard shark (*Triakis semifasciata*), among others. Most species found in the intertidal surf zone/sandflat habitat are widely distributed in coastal habitats; few are found primarily in the surf (Moyle and Cech 1982, Allen et al. 2006).

### Artificial Hard Substrate

Artificial hard substrate within the ROI consists of rip rap and quay wall constructed to stabilize shoreline areas and provides important diverse habitat, as discussed in Section 3.7.1.3.1. Natural hard substrate within San Diego Bay occurs on a very limited spatial extent based on National Oceanic and Atmospheric Administration charts. Davis et al. (2002) reported on average, intertidal riprap—and natural rocky habitats in wave-exposed environments—in southern California did not differ from each other in diversity, or community composition. The most common fish species, reported by Davis et al. (2002) during rip rap fish transects at each site, appeared directly related to the sites distance from the entrance of San Diego Bay. Open-coast rocky intertidal and rocky reef species; wooly sculpin (*Clinocottus analis*); opaleye (*Girella nigricans*); and black surfperch (*Embiotosa jacksoni*) were among the most abundant species during rip rap fish survey transects—with only the south San Diego Bay sites reporting any true estuarine resident fish species. Artificial hard substrate areas provide refuge and feeding areas for certain fish, such as perches, basses, sculpin, opaleye, and blennies that utilize rocky substrate that is of limited availability within San Diego Bay.

### Salt Pond

Salt ponds are large, persistent, saline impoundments of estuarine, ocean and bay water that are, or were, managed for salt production. San Diego Bay has natural salt marshes, and the salt ponds are part of a 130-year old ecosystem, the majority of which are still utilized by the Western Salt Company Salt Works. No fish are documented to inhabit the salt ponds.

### 3.8.1.2.2 Shallow Subtidal

The shallow subtidal encompasses approximately half of San Diego Bay and is comprised of several habitat types. These habitat types were described in Section 3.7.1.3.1. The abundance and biomass of fish is much higher in shallow waters compared to deeper waters (Allen 1999, Allen et al. 2006). The majority of eelgrass (*Zostera marina*) in San Diego Bay is constrained to the tidal range defined by the shallow subtidal habitat; consequently eelgrass habitats represent a substantial portion of high-value fish habitat throughout the ROI. Shallow subtidal habitat within San Diego Bay is mostly represented in the south and south central bay. Allen (1999) reported that Slough anchovies (*Anchoa delicatissima*) ranked third overall in numerical abundance and sixth in biomass for the five-year period of the study; and that the slough anchovies occupied the midwaters of the intertidal, nearshore and channel subhabitats—mainly in the South and South Central areas of San Diego Bay.

### Ecoregions of San Diego Bay

While the shallow subtidal habitat is divided into two habitat modifiers—vegetated versus unvegetated—the associated fish assemblages differ in composition and location. Allen (1999) found that similar numbers of fish were taken in the vegetated and unvegetated areas over all sampling methods. The distinction between the two shallow subtidal habitats is the vertical distribution of fish density. Analysis of fish sampling methods among gear types displayed marked differences in vegetated versus unvegetated habitat supporting the findings of Hoffman (1986) that fish catches were twice as large over eelgrass habitats, compared to unvegetated sites (Allen 1999).

### Unvegetated Shallow Soft Bottom

As discussed in Section 3.7.1.3.1, underwater observations indicate that algal mats present in unvegetated shallows are an important microhabitat feature—they provide cover or refuge from predators for many species of motile invertebrates and fish, much like marsh vegetation does for birds. The living plant material and detritus constitute a primary food source for California killifish, as well as an ancillary food source for other fish (Macdonald et al. 1990).

Unvegetated shallow areas support assemblages of benthic invertebrates and demersal fish that are distinct from vegetated shallow areas (Kramer 1990, Takahashi 1992a, Allen 1997). Many of these invertebrates serve as a food source for the demersal fish that occur in these unvegetated shallow areas of soft sediment. Common species to unvegetated shallow soft bottom include marine migrants California halibut, round stingray (*Urolophus halleri*), and diamond turbot (*Hypsopsetta guttulata*).

### Vegetated Shallow Soft Bottom

As discussed in Section 3.7.1.3.1, eelgrass, a native marine angiopserm, provides a critical benthic habitat in San Diego Bay. Table 3.8-2 displays the acreages of eelgrass present in SSTC bayside training lanes. Abundant algae and invertebrates that grow on the leaf blades provide primary and secondary productivity for consumption by larval and juvenile fish. Fish and invertebrates use eelgrass beds to escape from predators, as a food source, and as a nursery. The eelgrass beds provide surfaces for egg attachment and sheltered locations for juveniles to hide and feed. Eelgrass beds provide important habitat for several bay-estuarine fish species, including bay pipefish, barred pipefish (*Syngnathus auliscus*), shiner perch, and giant kelpfish (*Heterostichus rostratus*) (Allen et al. 2002).

**Table 3.8-2: Eelgrass Areas of the SSTC ROI and Individual San Diego Bay Training Areas**

| Bayside Training Area | Square Kilometers | Acres |
|---|---|---|
| Alpha | 0.0354 | 8.7 |
| Bravo | 0.0710 | 17.5 |
| Charlie | 0.0550 | 13.6 |
| Delta-I | 0.0940 | 23.2 |
| Delta-II | 0.2077 | 51.3 |
| Delta-III | 0.2616 | 64.7 |
| Echo | 0.1833 | 45.3 |
| Foxtrot | 0.4206 | 103.9 |
| Golf | 0.1108 | 27.4 |
| Hotel | 0.0342 | 8.5 |
| **Total** | **1.4736** | **364.1** |

Source: Composite data from 1994, 1999, 2004, and 2008 baywide eelgrass surveys.

### 3.8.1.2.3 Moderately Deep Subtidal

The moderately deep subtidal in San Diego Bay extends from the approximate lower depth of most eelgrass beds to the approximate edge of the shipping channel; it represents areas that have been dredged in the past, but are not maintained as navigational channels. The moderately deep subtidal in San Diego Bay is dominated by round stingray, spotted sand bass, California halibut, slough anchovy, and barred sand bass (*Paralabrax nebulifer*) (Allen 1998, Pondella et al. 2006).

### 3.8.1.2.4 Deep Subtidal

Deep subtidal habitat includes the surface water, water column and sediments for areas greater than 20 ft MLLW; it is associated with navigational channels. Except for a few areas in north bay that have no dredging record, all deep subtidal habitat has been dredged since the 1940s, with most of the dredging in the 1960s or more recently. Since very little of this habitat occurs in the ROI, it is not discussed further.

#### 3.8.1.2.5 Nearshore Ocean and Surf Zone

This habitat includes the area offshore, or oceanside of SSTC-N and SSTC-S, and includes the marine waters off of the sandy beaches of NASNI, SSTC-N (including the yellow through orange boat lanes), and SSTC-S (including the white and purple boat lanes). Also included are the ocean anchorages that partially overlap the SSTC-N ocean boat lanes. These habitats were described in Section 3.7.1.3.1.

Habitats on the oceanside of the SSTC can be described by a combination of depth, substrate, and wave energy. The nearshore area is primarily soft bottom, and spans from exposed sandy beaches to the water column above the inner-shelf. The coastal nearshore areas are classified as surf zone and coastal pelagic zone up to 100 miles westward, as described by Allen et al. (2006). The high energy surf zone and shallow (water depth < 98 feet) areas dominated by sand and low lying (< 6.6 feet) rocky reef and cobble are illustrated in Figure 3.7-3. Utilizing the habitat classification system developed for San Diego Association of Governments and California Coastal Conservancy (Merkel & Associates, Inc. et al. 2002), the majority of the area is described as a Subtidal/Soft Bottom/Sand ecotype, with a low to moderate energy ecotype modifier, because of seasonal variability with respect to wave energy.

Higher abundances and species diversity of invertebrates are found on long, gently sloping beaches, while lower abundances and diversity are present on steep, coarse-grained beaches. Demersal fish, common in sandy beach habitat in San Diego County, include bat rays, round stingrays, leopard sharks, California halibut, and sole (Family Pleuronectidae).

#### 3.8.1.2.6 San Diego Bay

Bays and estuaries are known to be important nursery and refuge areas for marine fish (Cronin and Mansueti 1971, Haedrich and Hall 1976). Bays and estuaries are recognized as important fish habitat, serving especially as spawning and nursery sites, migration routes, and areas naturally supporting large populations of certain coastal fish species (Elliot 2002). Estuaries are among the most productive areas on earth, and the fish biomass in this habitat rank with that of the marine regions of upwelling, coral reefs, and kelp beds (Allen et al. 2006). Principal estuarine residents in San Diego Bay include Pacific staghorn sculpin (*Leptocottus armatus*), bay pipefish, and arrow goby, which are all synonymous with large estuaries throughout California. Other common estuarine species are California killifish, slough anchovy, deep body anchovy, spotted sand bass, and several other species of goby. Marine migrant fish are a major component of the fish assemblages found in San Diego Bay and utilize different portions and habitats of the San Diego Bay at various life stages. Marine migrants are dominated by topsmelt, shiner perch (*Cymatogaster aggregate*), juvenile California halibut, and yellowfin croaker (*Umbrina roncador*), among others. Another important characteristic of the fish inhabiting southern California bays and estuaries, including San Diego Bay, is that they form distinct species assemblages found nowhere else (Horn 1980; Horn and Allen 1981; Allen 1985, 1997; Macdonald et al. 1990).

Over 100 species of native fish are documented in San Diego Bay (Macdonald et al. 1990; Allen 1999; Pondella et al. 2006). Pondella et al. (2006) collected 57 species from two quarterly surveys in 2005—studies not substantially different from Allen's study (1999), which collected species assemblage data over a much longer period. During 20 seasonal sampling periods (July 1994 to April 1999), Allen (1999) reported 78 species of fish from throughout San Diego Bay. This contrasts with 56 species in 1892 (Eigenmann 1892), and only 25 species between 1968 and 1979 (Ford 1968; Ford et al. 1971; Lockheed 1979), which correspond to a period when waters of the ROI were recovering from many decades of raw sewage delivery. Allen (1998) and the Pondella et al. (2006) employed an Ecological Index to identify fish species that dominate San Diego Bay based on abundance, biomass, and frequency of occurrence. This index is expressed as:

$$\text{Ecological Index} = \%N \times \%W \times \%F$$

Where N = Abundance, W = Biomass, and F = Frequency

This measure is a modification of the Index of Relative Importance, which is used extensively in studies considering prey species from the gut contents of fish (Pinkas et al. 1971). Pondella et al. (2006) repeated this analysis in 2005.

Sampling performed by Allen et al. (1999) and Pondella et al. (2006) integrated sampling designs to investigate various habitats within the San Diego Bay, providing insight to the partitioning of fish abundance within distinct ecoregions and defined habitat types. The bayside training areas are all located within the South Central Ecoregion and are composed of moderately deep, shallow subtidal, and intertidal habitat, both vegetated (eelgrass) and unvegetated.

With an average of data from all ecoregions and years, Allen et al. (1999) estimated the numerical density of fish in San Diego Bay to be 1.75 individuals per square meter. On average, San Diego Bay contains 85 million fish, based on the estimated surface area. Most individuals were made up of northern anchovies (42 million); but there were on average almost 18 million slough anchovies, 10 million topsmelt, 3 million sardines, three million arrow gobies, and nearly two million shiner perch (Allen et al. 1999). Common higher level carnivorous fish such as round stingray, spotted sand bass, and California halibut were estimated to number 280,000, 133,000, and 80,000, respectively (Allen et al. 1999). The best estimates of numerical density for the individual ecoregions were 2.03 individuals/$m^2$ for the North Ecoregion, 1.93 individuals/$m^2$ for the North Central Ecoregion, 0.81 individual/$m^2$ for the South Central Ecoregion, and 1.15 individuals/$m^2$ for the South Ecoregion (Allen et al. 1999). The 10 species considered to be most dominant by Allen (1998) and by Pondella et al. (2006) based on their Ecological Index values, are listed in Table 3.8-3. Seven of the 10 species listed by Allen (1999) were included in the top 10 ecological index species in the Pondella et al. (2006) study. Ranking order was similar in both studies and only the Pacific sardine was noticeably absent in the Pondella ecological index ranking table; it was replaced by the deepwater anchovy, a similar schooling baitfish.

**Table 3.8-3: Ranking of Top 10 "Ecological Index" Fish Species for Two Survey Reports Using the Same Methods in San Diego Bay**

| Scientific name | Common name | Rank 1994-1999 (Allen et al. 1999) | Rank 2005 (Pondella et al. 2006) |
|---|---|---|---|
| *Atherinops affinis* | Topsmelt | 1 | 2 |
| *Urobatus halleri* | round stingray | 2 | 1 |
| *Engraulis mordax* | northern anchovy | 3 | 7 |
| *Anchoa delicatissima* | slough anchovy | 4 | 3 |
| *Paralabrax maculatofasciatus* | spotted sand bass | 5 | 5 |
| *Paralabrax nebulifer* | barred sand bass | 6 | 10 |
| *Paralichthys californicus* | California halibut | 7 | 9 |
| *Cymatogaster aggregata* | shiner surfperch | 8 | 6 |
| *Sardinops sagax* | Pacific sardine | 9 | 48 |
| *Heterostichus rostratus* | giant kelpfish | 10 | 13 |
| *Anchoa compressa* | deepbody anchovy | 34 | 4 |
| *Myliobatis californica* | bat ray | 18 | 8 |

Results from Pondella et al. (2006) survey are similar to Allen et al. (2002) in which topsmelt, round stingray, northern anchovy (ranked 8th in 2005), slough anchovy and spotted sand bass were ranked first through fifth, respectively. The similarity suggests that these species are critical components of the trophic structure of San Diego Bay; and that they may serve as good proxy to the overall health of the fish in the San Diego Bay ecosystem (Pondella et al. 2006).

The dominant fish assemblages in San Diego Bay were associated with regional area and habitat type. Species that were found to be numerically dominant (e.g., northern anchovy, slough anchovy, and topsmelt) during previous surveys showed a greater affinity to the northern portion of San Diego Bay, while the South-Central Ecoregion provided important nursery habitat for young of the year (YOY) for a wide range of San Diego Bay resident and marine migrant fish species. However, Allen (1999) and Pondella et al. (2006) found that the South-Central Ecoregion contained the lowest density, biomass, and diversity of fish species among all the ecoregions of the San Diego Bay.

Fish species and assemblages are commonly partitioned by habitat. Species groups with wide spread distributions among major habitat types are referred to as generalists, while those with restricted distributions are specialists. Considering that San Diego Bay and the ROI contain both diverse and distinct habitat types, the fish utilizing these areas are made up of a mixture of both resident specialists (e.g., arrow gobies, bay pipefish) and generalists (e.g., spotted sand bass, northern anchovies). The total amount of submerged habitat within San Diego Bay is 15,694 acres (San Diego Bay Integrated Natural Resources Management Plan [INRMP] 2000). The ROI within San Diego Bay contains 1,883.6 acres of submerged fish habitat divided into four categories: 1) deep (< -20 feet MLLW), 2) moderately deep (-12 to -20 feet MLLW), 3) shallow (-2 to -12 feet MLLW), and 4) intertidal (+2 to -2 feet MLLW). This represents 12.7 percent of all available fish habitat within San Diego Bay.

Submerged fish habitat within the San Diego Bay portions of the ROI encompasses deep (22.3 acres), moderately deep (982.7 acres), shallow (846.2 acres), and intertidal (32.4 acres) habitat types (Table 3.7-3). The South-Central Ecoregion is unique in that the eastern portion of the ecoregion is nearly completely dominated by armored shoreline (piers and quay wall) adjacent to deep water and the western portion (the San Diego Bay portion of the ROI) is comprised of gradual sloping bathymetry ending in intertidal mudflats and beaches. The North and North-Central Ecoregions contain narrow bands of moderately deep habitat because the shorelines associated with these areas are steeply sloped. Conversely, the South Ecoregion is dominated by expansive eelgrass habitats and salt marsh (outside of the Bay portion of the ROI), with shorelines that are gently sloped terminating at deep dredged channels. The moderately deep habitat within the San Diego Bay portion of the ROI represents the greatest area and percentage with respect to other habitats, considering the regional partitioning of habitat.

Eelgrass habitats contain a wide variety of fish species and span areas from intertidal to moderately deep subtidal depending on differing regions of San Diego Bay. Hoffman (1986) compared abundance and biomass of fish utilizing eelgrass beds and adjacent unvegetated area in three sections of San Diego Bay. The study concluded that eelgrass sites supported nearly twice as many individual fish. Density estimates from square enclosures used to enumerate burrow-inhabiting fish species such as gobies found densities of approximately 3.6 ind/m$^2$ (Allen 1999). The higher catches—at vegetated sites in five of ten possible gear comparisons performed by Allen et al. (1999)—were consistent with previous studies and, considering gear limitations, likely understated fish densities within vegetated habitat.

### 3.8.1.2.7 Coastal Nearshore

The habitats and associated fish communities of the nearshore coastal areas within the ROI are classified as surf zone and coastal pelagic zone (Allen et al. 2006). The nearshore area that encompasses the ROI is primarily soft bottom and spans from exposed sandy beaches to the water column above the inner shelf, typical of much of the southern California coastline. The coastal nearshore habitat within the ROI is high energy surf zone and shallow (< 100 feet) nearshore areas dominated by sand and low lying (< 6.0 feet) rocky reef and cobble (as described in Section 3.7.1.3.1). The fish common to these areas occur over the more shallow portions of the shelf and the soft bottom surrounding rock reef and kelp bed environments.

The fish assemblages of this area tie all the shallow water habitats closely together (Allen 1985). Fish observations within the San Diego region have recently been described by Merkel & Associates Inc. et al. (2002). A bathymetric survey of the area immediately offshore of the Silver Strand confirmed substrate conditions (Tierra Data Inc. 2006). The understory algae associated with the cobble substrate is comprised of primarily fleshy red algae; and canopy-forming macroalgae are mostly absent or infrequent. Associated invertebrate and fish communities in the understory algae habitat are similar to those found in kelp beds. Fish species commonly found in southern California kelp beds include topsmelt, surfperch, northern anchovy, California sheephead (*Semicosiphus pulcher*), and several species of bass (*Paralabrax* spp) and rockfish (*Sebastes* spp.).

Considering the substantial overlap of surf zone soft bottom and coastal pelagic habitat, in conjunction with the proximity of rocky reef kelp forest habitat, the range of fish species likely to occur within the ROI is broad. Fish species associated with the surf zone soft bottom overlap considerably with San Diego Bay and estuarine species, as well as YOY of other coastal pelagic species. Most species in the surf zone occur in other coastal habitats, and a few species occur primarily in the surf (Allen et al. 2006). Common species in the southern California surf zone are listed in Table 3.8-4.

**Table 3.8-4: Common Southern California Surf Zone Fish Species**

| Scientific Name | Common Name | Scientific Name | Common Name |
|---|---|---|---|
| *Engraulis mordax* | Northern anchovy | *Atherinopsis californiensis* | Jacksmelt |
| *Atherinops affinis* | Topsmelt | *Leuresthes tenuis* | California grunion |
| *Hyperprosopon argenteum* | Walleye surfperch | *Seriphus politus* | Queenfish |
| *Anchoa compressa* | Deepbody anchovy | *Amphistichus argenteus* | Barred surfperch |
| *Menticurrhus undulates* | California corbina | *Umbrina roncador* | Yellowfin croaker |
| *Urobatus halleri* | Round stingray | *Mustelus californicus* | Gray smoothhound |
| *Roncador stearnsii* | Spotfin croaker | *Triakis semifasciata* | Leopard shark |
| *Micrometrus minimus* | Dwarf perch | *Syngnathus exilis* | Barcheek pipefish |
| *Heterostichus rostratus* | Giant kelpfish | | |

Source: Pondella et al. 2006

Coastal pelagic species inhabit the open water environment over the inner shelf, but they usually occur within a few kilometers of shore. Species include planktivores, such as anchovies; roving stratum-feeders, such as croakers and California corbina (*Menticurrhus undulates)*; and piscivores, such as Pacific mackerel (*Scomber japonicas*), Pacific bonita (*Sarda chiliensis*), and California barracuda (*Sphyraena argentea*), among others. Upwelling—and the mechanisms that regulate primary production—affects the temporal and spatial variability of the multiple trophic levels represented by this group of fish.

Fish species associated with rocky reefs and kelp beds overlap with other nearshore habitat types; and although kelp and other macroalgae play a substantial role abundance and distribution of these species, the kelp and microalgae are only one of many factors that affect the distribution of these nearshore fish species. Recent estimates suggest that kelp forest habitat supports between 6 and 15 times the density of fish compared to a similar area of soft substrate (Bond et al. 1999). The complexity and type of structure (rock) play an important factor in the variation and density of rocky reef fish. The greater the complexity of the reef structure, the larger the surface area for encrusting invertebrates and attached algae; hence, the availability of food for associated fish species. In turn, the complexity and type of structure provide shelter for smaller fish and invertebrates, to protect them from higher-level predatory fish, increasing species diversity. Kelp bed and rocky reef fish overlap considerably with coastal pelagic, surf zone, and some deep rock habitat species. Because of the seasonal and diurnal nature of many fish species, the rocky reef/kelp forest habitats have a high-diversity of fish, invertebrate, and algal species. The most common rocky reef/kelp forest species are listed in Table 3.8-5.

**Table 3.8-5: Common Reef Fish Species Not Including Coastal Pelagic or Surf Zone Species Previously Listed**

| Scientific Name | Common Name | Scientific Name | Common Name |
|---|---|---|---|
| *Chromis punctipinnis* | Blacksmith | *Medialuna californiensis* | Halfmoon |
| *Brachyistius frenatus* | Kelp surfperch | *Sebastes atrovirens* | Kelp rockfish |
| *Oxyjulis californica* | Senorita | *Rhacochilus toxotes* | Rubberlip surfperch |
| *Xenistius californiensis* | Salema | *Sebastes serriceps* | Treefish |
| *Gymnothorax mordax* | California moray | *Anisotremus davidsonnii* | Sargo |
| *Pleuronichthys coenosus* | CO turbot | *Heterodontus francisci* | California hornshark |
| *Hypsypops rubicundus* | Garabaldi | *Semicossyphus pulcher* | California sheephead |
| *Paralabrax clathratus* | Kelp bass | *Halichoeres semicinctus* | Rock wrasse |
| *Stereolepis gigas* | Giant black seabass | *Atractoscion nobilis* | White seabass |
| *Caulolatilus princeps* | Ocean whitefish | *Damalichthys vacca* | Pile perch |
| *Embiotoca jacksoni* | Black surfperch | *Hypsurus caryi* | Rainbow perch |
| *Scorpaena guttata* | California scopionfish | *Coryphopterus nicholsii* | Blackeye goby |
| *Cephaloscyllium ventriosum* | Swell shark | *Paralabrax nebulifer* | Barred sand bass |
| *Cheilotrema saturnum* | Black croaker | | |

Source: Pondella et al. 2006

The ROI is typical of much of the California coastline, encompassing a primarily soft sand bottom interspersed with variable hard substrate in conjunction with one of the few large bay and estuarine systems, San Diego Bay. Factors affecting the nearshore habitat and associated fish species include wave action, sediment transport, and influences from freshwater systems.

The Tijuana River, located just south of the action area, and San Diego Bay are substantial contributors of sediment, fresh water, and nutrients, and are major contributors in shaping the subtidal community dynamics of nearshore Silver Strand. Biological communities associated with the hard bottom substrate within the study area fluctuate in presence and density both seasonally and spatially due to the areas' exposure, depth, and proximity to sediment and freshwater sources.

Few studies have concentrated on evaluating the density and diversity of fish species of nearshore soft bottom habitat in contrast to investigations of kelp forests. In order to enumerate the abundance of fish within the ocean portions of the ROI, California Department of Fish and Game catch block data was analyzed for the years 2002-2005. Portions of catch blocks 860, 877, and 878 incorporate a portion of the ROI and thus were included in the analysis. Catch in pounds-per-year for all gear types and methods for the five most abundant targeted fish species and fish species likely to occur at least within a portion of the ROI are presented in Table 3.8-6. The most abundant species in terms of pounds caught were tuna (all species), white seabass, California sheephead, California halibut, swordfish (*Xiphias gladius*), and shark (all species), respectively. Use of these data in relationship to the ROI should take into consideration the fact that substantial portions of the catch blocks occur outside the ROI; and a majority of these fish species are captured using gill nets, which are restricted to beyond three miles of the mainland coast, also placing them well outside of the ROI. Additional species encompassed in the catch block data include several species known to occur within San Diego Bay during some life stage, as well as fish known to utilize nearshore surf zone areas for opportunistic foraging and/or spawning.

**Table 3.8-6: Catch Data for the Five Most Abundant Fish Species and Fish Species Likely to Occur Within the ROI for the Years 2002-2005**

| Common Name | Gear Type | Total Pounds (2002-2005) |
|---|---|---|
| Tuna – all | All | 94,925 |
| Seabass – white | All | 78,530 |
| Sheephead - California | All | 71,132 |
| Halibut - California | All | 46,064 |
| Swordfish | All | 39,843 |
| Shark – all | All | 35,590 |
| Barracuda - California | All | 17,233 |
| Rockfish – all | All | 14,745 |
| Sardine - Pacific | All | 4,741 |
| Scorpionfish | All | 4,696 |

Species listed in the catch block data are associated with hard bottom habitat such as California sheephead, scorpion fish (*Scorpaena guttata*), rockfish (all species), cabezon (*Scorpaenichthys marmoratus*), and lingcod (*Ophiodon elongatus*); these species only transit or forage within the ocean portions of the ROI on a limited basis, considering the proximity of primary hard bottom habitat to the north at Point Loma and south at Imperial Beach. Pelagic species including California barracuda, Pacific mackerel, Pacific sardines (*Sardinops sagax caerulea*), and Pacific bonita use the nearshore portion of the ROI to varying degrees depending on oceanographic conditions that affect primary production and food availability. Pelagic species use the upper portion of the water column and are considered seasonal migrants, not documented to inhabit surf zone areas for substantial time periods.

Considering the habitat contained with the coastal nearshore portions of the ROI the most likely species to frequent the surf zone areas shallower than 20 feet MLLW are perch, croaker, California grunion, topsmelt, YOY white seabass, and California halibut. All of these are well adapted to the physical rigors of the surf zone habitat and take advantage of suspended material for foraging. Love et al (1986) documented that queenfish (*Seriphus politus*), white croaker (*Genyonemus lineatus*), and northern anchovy had the greatest index of community importance for soft bottom habitat at 6 meters depth for three southern California beaches. California grunions are known to spawn on nearby Imperial Beach (United States Army Corps of Engineers 1995) and the Coronado Strand. California grunion spawn at night as the highest tides recede; after approximately two weeks the recently hatched fish larvae are swept out to sea during high tides. California grunion use the upper intertidal habitat of beaches for spawning from late February to early September; Grunion activity is expected to be concentrated from late March to early June.

### 3.8.1.3 Ichthyoplankton

Planktonic fish larvae are an important and distinctive mode of life considered a separate category of plankton called ichthyoplankton; they have been studied extensively in south San Diego Bay (Department of the Navy [DoN]/San Diego Unified Port District [SDUPD] 2000). It appears that ichthyoplankton species composition and abundance differ substantially from juvenile/adult fish composition and abundance of south San Diego Bay. This means the value of south San Diego Bay for juvenile and adult fish is different from its value for fish eggs and larvae—when data from Allen (1998) are compared with plankton data from south San Diego Bay. Studies cited in DoN/SDUPD 2000 describe a seasonal study in which conical net tows were taken at eight, south San Diego Bay stations every two to four weeks over a one-year period (1972–1973). The primary purposes of this research were to describe and evaluate the species composition and seasonal dynamics of larval fish in the area, and to assess possible effects from the South Bay Power Plant. Researchers identified the eggs and larvae of 18 species of fish from the study area, and found that the eggs of two species—the deepbody anchovy and the diamond turbot—accounted for over 97 percent of the planktonic eggs collected; however, juvenile and adults of these species were not common in fish catches (Allen 1998). One taxonomic group consisting of the larvae of arrow, cheekspot, and shadow gobies, accounted for over 87 percent of the fish larvae sampled during the one-year period. Atherinid larvae, consisting of the topsmelt and jacksmelt (*Atherinopsis californiensis*), accounted for 8.5 percent, while the remaining 4.5 percent included representatives of ten other species or higher taxa. Several of these species exhibited seasonal patterns of occurrence, and it was concluded that the ichthyoplankton assemblage of south San Diego Bay contained fewer species than occur in coastal waters along the Pacific coast of the United States.

### 3.8.1.4 Commercial and Recreational Fisheries

Fish in San Diego Bay taken by commercial or recreational fishing are listed in Table 3.8-7. Those species that support a commercial fishery are indicated with an asterisk. Commercial fishing no longer occurs in San Diego Bay: the last commercial fishery, for striped mullet (*Mugil cephalus*) in south San Diego Bay, ended in 1998. However, seven species inhabiting San Diego Bay support commercial fisheries elsewhere in southern California waters. The most important of these is the California halibut, The northern anchovy is taken commercially for use as live bait. In addition, the Pacific sardine is taken as part of this catch. Fish caught for live bait are brought and held in bait receivers located in north San Diego Bay, where they are sold to commercial and recreational fisherman. A much larger group of species are caught within the San Diego Bay by recreational fisherman and by those who fish for subsistence. At least 58 species are involved in the recreational catch.

### 3.8.1.5 Pacific Coast Groundfish Fishery Management Plan

The Pacific Coast Groundfish Fisheries Management Plan (FMP) manages 89 species over a large and ecologically diverse area (Pacific Fisheries Management Council [PFMC] 2004). These species occupy diverse habitats at all stages of their life histories—such as rockfish that have pelagic (open water) eggs and larvae. In contrast, some species may have a discrete or narrow Essential Fish Habitat (EFH, Section 3.7.1.3.2), such as adult rockfish showing strong affinities for specific locations/habitats. In addition, the FMP identifies seven composite EFHs including estuarine, rocky shelf, non-rocky shelf, canyon, continental slope/basin, neritic zone, and oceanic zone. The FMP also identifies both fishing-related and non-fishing-related activities that may cause adverse impacts to EFH. For example, non-fishing-related activities that potentially affect groundfish EFH include dredging, fill, excavation, mining, impoundment, discharge, water diversions, thermal actions, activities that contribute to non-point source pollution and sedimentation, and the introduction of potentially hazardous material (PFMC 2004).

Detailed life history information about federally protected fish in the groundfish management plan is available as an appendix to Amendment 19 of the Pacific Coast Groundfish FMP (PFMC 2005). These data are culled from fishing records where available, and from scientific literature about the species' preferences for certain latitudes, substrates, and depths. Based on this information, species for which the habitat in the ROI is at least 40 percent suitable for at least one life stage of the fish are listed in Table 3.8-8. Fish are also listed if previously identified in San Diego Bay (Merkel & Associates 2000; Allen 1999; Hoffman 1995). These fish are expected to occur in the ROI because of the highly suitable nature of the habitat for one or more stages of their life cycle. Habitat Suitability Probabilities for all fish in the Groundfish FMP are available in Appendix B to Amendment 19 of the FMP.

**Table 3.8-7: Fish Species of San Diego Bay Taken by Recreational and Commercial Fishermen**

| Scientific Name | Common Name | Scientific Name | Common Name |
|---|---|---|---|
| Osteichthyes | bony fish | *Pleuronichthys ritteri* | spotted turbot |
| *Atherinops affinis* | Topsmelt | *Pleuronichthys verticalis* | hornyhead turbot |
| *Atherinopsis californiensis* | Jacksmelt | *Cheilotrema saturnum* | black croaker |
| *Leuresthes tenuis* | California grunion | *Atractoscion nobilis** | white seabass |
| *Hippoglossina stomata* | bigmouth sole | *Genyonemus lineatus* | white croaker |
| *Xysteurys liolepis* | fantail sole | *Menticurrhus undulates* | California corbina |
| *Caranx caballus* | green jack | *Roncador stearnsii* | spotfin croaker |
| *Caranx hippos* | crevalle jack | *Seriphus politus* | queenfish |
| *Trachurus symmetricus* | jack mackerel | *Umbrina roncador* | yellowfin croaker |
| *Chanos chanos* | milkfish | *Sarda chiliensis* | Pacific bonito |
| *Clupea harengus pallasii* | Pacific herring | *Scomber japonicas* | Pacific mackerel |
| *Sardinops sagax caeruleus** | Pacific sardine | *Scomberomorus sierra* | sierra |
| *Scorpaena guttata* | sculpin | *Medialuna californiensis* | halfmoon |
| *Scorpaenichthys marmoratus* | cabezon | *Morone saxatilis* | striped bass |
| *Amphistichus argenteus* | barred surfperch | *Paralabrax clathratus** | kelp bass |
| *Cymatogaster aggregata* | shiner surfperch | *Paralabrax maculatofasciatus* | spotted sand bass |
| *Damalichthys vacca* | pile surfperch | *Paralabrax nebulifer* | barred sand bass |
| *Embiotoca jacksoni* | black surfperch | *Sphyraena argentea* | California barracuda |
| *Hyperprosopon argenteum* | walleye surfperch | *Albula vulpes* | bonefish |
| *Micrometrus minimus* | dwarf surfperch | *Cynoscion parvipinnis* | shortfin corvine |
| *Phanerodon furcatus* | white surfperch | Chondrichthyes | sharks and rays |
| *Rhacochilus toxotes* | rubberlip surfperch | *Carcharhinus remotus* | narrowtooth shark |
| *Engraulis mordax** | northern anchovy | *Galeorhinus zyopterus* | soupfin shark |
| *Girella nigricans* | opaleye | *Mustelus californicus* | gray smoothhound |
| *Mugil cephalus** | striped mullet | *Mustelus henlei* | brown smoothhound |
| *Hypsopsetta guttulata* | diamond turbot | *Mustelus lunulatus* | sicklefin smoothhound |
| *Paralichthys californicus** | California halibut | *Prionace glauca* | blue shark |
| *Platichthys stellatus* | starry flounder | *Triakis semifasciata* | leopard shark |
| *Parophrys vetulus** | English sole | *Sphyma zygaena* | smooth hammerhead shark |
| *Pleuronichthys coenosus* | CO turbot | *Squalus acanthias* | spiny dogfish |

Note: Asterisks indicate species of commercial importance in southern California waters

As well as designating EFH, the PFMC designates Habitat Areas of Particular Concern (HAPC). These are ecologically important, rare, or sensitive habitats that should be given special attention when evaluating the effects of non-fishing impacts. San Diego Bay meets two criteria for an HAPC: as an estuary and as an eelgrass habitat (3.7.1.3.2 Marine Plants and Invertebrate Community Overview).

The FMP for Coastal Pelagic Species (CPS) includes five species—four finfish and one invertebrate—including northern anchovy, jack mackerel (*Trachurus symmetricus*), Pacific sardine, Pacific (chub) mackerel (*Scomber japonicus*), and market squid (*Loligo opalescens*) (PFMC 1998). All but the market squid could be expected in the ROI. The remaining species have wide distributions throughout California, as well as in international waters outside of the U.S. Exclusive Economic Zone, and are taken directly or indirectly with a variety of fishing gear. Gear used to commercially harvest CPS by directed fishing methods include round-haul nets such as purse seines, drum seines, lampara nets, and dip nets (PFMC 1998). CPS can also be taken incidentally in midwater trawls, pelagic trawls, gill nets, trammel nets, trolls, pots, and hook-and-line techniques. Non-fishing-related activities that have the potential to harm groundfish species could also have the same effect on these pelagic species.

**Table 3.8-8: Fish that Are Included in the Pacific Groundfish Fishery Management Plan that Could Be Expected to Appear in the Region of Interest**

| Scientific Name | Common Name |
|---|---|
| *Triakis semifasciata* | leopard shark |
| *Raja binoculata* | big skate |
| *Raja inornata* | California skate |
| *Raja rhina* | longnose skate |
| *Ophiodon elongates* | lingcod |
| *Sebastes chrysomelas* | black and yellow rockfish |
| *Sebastes mystinus* | blue rockfish |
| *Sebastes paucispinis* | bocaccio |
| *Sebastes dallii* | calico rockfish |
| *Sebastes goodei* | chilipepper |
| *Sebastes carnatus* | gopher rockfish |
| *Sebastes rastrelliger* | grass rockfish |
| *Sebastes chlorostictus* | greenspotted rockfish |
| *Sebastes umbrosus* | honeycomb rockfish |
| *Sebastes atrovirens* | kelp rockfish |
| *Sebastes diploproa* | splitnose rockfish |
| *Sebastes saxicola* | stripetail rockfish |
| *Sebastes serriceps* | treefish |
| *Pleuronichthys decurrens* | curlfin sole |
| *Citharichthys sordidus* | Pacific sanddab |
| *Scorpaena guttata* | California scorpionfish |
| *Parophrys vetulus* | English sole |

### 3.8.1.6 Threatened and Endangered Species

No federally threatened or endangered fish are documented to utilize the waters of the ROI during any portion of their life cycle.

### 3.8.1.7 Current Management through Monitoring and Enhancement

All species groups are monitored through the San Diego Bay INRMP, including baseline inventory and regular monitoring. INRMPs are developed jointly by the Navy and fish and wildlife agencies such as the CDFG, USFWS, 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. Terrestrial and marine aspects of natural resources management are addressed in the NBC INRMP. Marine aspects are also addressed in the San Diego Bay INRMP. INRMPs help installation commanders manage their natural resources in a manner that is consistent with sustainability of those resources and to ensure continued support of the military mission.

A portion of the fish species are also intermittently evaluated through the project site approval process. The most recent comprehensive San Diego Bay survey effort was in April and July 2005 (Pondella et al. 2006). Surveys identify and quantify San Diego Bay's utilization of fishery populations, identify habitats that support juvenile fish, and determine areas of San Diego Bay that support important populations of forage fish species. The INRMP and surveys are funded jointly by the U.S. Navy and the Port of San Diego.

The Navy is also in the process studying EFH throughout the San Diego Bay. As discussed in Section 3.7.1.3.2, this study will facilitate the valuation of EFH with special focus on the habitat types most likely to be impacted by Navy activities or be used to mitigate for potential Navy project impacts.

#### 3.8.1.8 Current Mitigation Measures

No current mitigation measures are in place that address fish species specifically. Habitat mitigation for intertidal and subtidal areas (Section 3.7.1.5), including eelgrass, provide a degree of mitigation for fish species documented to reside within those habitats.

### 3.8.2 Environmental Consequences

This section presents the analysis of potential impacts to fish as a result of implementation of the project alternatives, including the No Action Alternative. The analysis of effects on fish concerns direct physical injury—the potential for death, injury, or reduced productivity due to disturbance. Two EFHs are located within the ROI: (1) Eelgrass EFH, and (2) Groundfish EFH. Groundfish EFH encompasses estuarine, rocky shelf, non-rocky shelf, canyon, and oceanic zone within the ROI. Alternatives 1 and 2, increase training tempo from baseline conditions, introduce new platforms and equipment into training, and decrease access restrictions and encumbrances on training. Implementation of any alternative other than the No Action Alternative will result in an increase in the number of training activities that are conducted in the ROI. Alternative 2 is identical to Alternative 1, except that the Navy would utilize all 7,000 yards of ocean beaches along SSTC-N and SSTC-S, and all bayside training beaches—except the Delta North and South California least tern nesting habitat (i.e., Alpha, Bravo, Charlie, Echo, Foxtrot, Golf, and Hotel) for continuous, year-round training. Activities analyzed in this section for all alternatives are 1-14, 16, 18, 20-30, 32-35, 37-42, 44-46, 49-53, 57, 66, 73, 77, and 78 and N1-N9 and N11 (Table 2-1 and 2-2). Marine vessel traffic in the SSTC—mainly support vessels for training activities—is analyzed for effect. Training activities in which interactions between personnel/craft and fish are anticipated to be rare—swimming, diving, or activities that utilize only non-motorized combat raiding rubber crafts (CRRCs) (Activities 54, 55, 56, 60, 64, 67, 69-71, and 73, Table 2-1)—are excluded from individual analysis as potential impacts from interactions would be minimal to non-existent. Training activities that occur exclusively on the land portion of SSTC are excluded from this analysis as they are not expected to impact fish that may be present adjacent to the SSTC beach or bayside training areas. (Activities 15, 17, 19, 31, 36, 43, 47, 48, 58, 59, 61-63, 65, 68, 72, and 74-76; and N10, Table 2-1 and 2-2). The U.S. Navy has conducted an EFH assessment to establish all potential EFH impacts and has consulted with the NMFS regarding potential effects to EFH. Results of potential impacts to EFHs are addressed in 3.7.5.

#### 3.8.2.1 Approach to Analysis

To assess the impact of training activities on fishery resources in the ROI, training activities were divided into constituent activities that have potential to impact the environment. These activities occur in a defined manner and space; therefore their effect on the environment can be assessed. A literature review on potential effects common to most activities is presented and includes shock waves, acoustic effects (noise), disturbance, and habitat modification.

Effects on fish, and the distances at which behavioral effects can occur, depend on the nature of the disturbance, the sensitivity of the fish, and species-specific behavioral responses. Changes in fish behavior can reduce their catch ability. The following methods were used to assess potential effects on fish: Received stimuli that correspond to the various types of effects on fish; and effects to fish including physical damage to fish, short-term behavioral reactions, long-term behavioral reactions, and changes in distribution.

The relative abundance of fish species present within the effect area was estimated. Whether there was an effect within each effect area was then determined. If there was an effect, it was described in terms of relative numbers affected versus total relative population on the range. The no effect determination included cases where there were no effects on fish; or there were inconsequential changes in their behavior.

Whereas baseline conditions describe the relative abundance of fish as estimated from density or fisheries data, estimates of the absolute abundance of fish for the nearshore coastal areas of interest are not available. There are few available estimates of abundance for the shallow areas of SSTC-N and SSTC-S. Thus, effects on fish in the nearshore coastal area are expressed in relative terms.

There are two types of sound sources that are of concern to fish and fisheries. 1) Strong underwater shock pulses that can cause physical damage to fish. 2) Underwater sounds that could cause disturbance to fish and affect their biology or catch ability by fishermen. Both types of sound can cause changes in fish distribution and/or behavior. This assessment focuses on these potential effects on fish.

Disturbance of fish and/or modification of fish habitat from activities are evaluated based on the area the individual action encompasses, and the value and type of habitat known to occur within the specific area. The activity descriptions provided below (Sections 3.8.2.2 and 3.8.2.3) define the general location and manner in which the activity occurs, which can then determine how resources are affected that are not evenly distributed across the environment.

The data obtained on effects of sound and shock waves on fish are very limited—in terms of number of well-controlled studies and in number of species tested. There are limits in the range of data available for any particular type of sound source. Additionally, available data focused on fish habitat modification or disturbances related to behavioral changes in fish movement or activity from aircraft and marine vessels are limited or absent. Considering the sources of shockwaves, sound, and habitat modification associated with the activities described in Chapter 2, effects pertaining to fish are grouped by action in the following alternatives analysis.

#### 3.8.2.1.1 Effects of Shock Waves

Underwater explosions can affect fishes in two basic ways: they can be physically injured and killed or their behavior could be altered in a manner that reduces their survival. This section discusses underwater detonations and the metrics used to describe them, and summarizes information on the susceptibility of fishes to these detonations.

An underwater detonation produces a pressure wave that radiates quickly from the detonation site. The strength of this wave depends on the type and amount of explosive, the location of the detonation in the water column (near the bottom versus near the surface), distance from the detonation site (the strength of the pressure wave dissipates with distance), and the location of the fish in the water column. The typical pressure wave from an explosion consists of an instantaneous increase to the peak pressure, followed by a slower (but still very rapid) logarithmic decrease to ambient pressure (SAIC 2000). The pressure wave can be displayed as a waveform that describes the pressure-time history, where time is measured in seconds, while pressure is measured in micropascals (µPa).

The principal mechanism by which pressure waves from blasts cause physical injuries to organisms is through oscillations in body tissues. Most blast injuries in marine animals involve damage to air- or gas-containing organs (Yelverton 1981). For example, fish with swim bladders are vulnerable to the effects of explosives, while fish without swim bladders (flatfish, sharks, and rays) and invertebrates are much more resistant (Yelverton 1981, Young 1991). During exposure to shock waves, the swim bladder oscillates and may rupture, in turn causing hemorrhages in nearby organs. Fish that have thick-walled swim bladders that are close to the body wall and away from the kidneys are more resistant to blast injury than are fish with thin-walled swim bladders that touch the kidneys. Studies suggest that larger fish are generally less susceptible to death or injury than small fish at the same distance from the source (Yelverton et al. 1975); elongated forms that are round in cross-section are less at risk than deep-bodied forms; and orientation of fish relative to the shock wave may affect the extent of injury. Research has focused on the effects on the swim bladder from underwater detonations but not the ears of fish (Edds-Walton and Finneran 2006). The results of most studies are dependent upon specific biological, environmental, explosive, and data recording factors. One of the real problems with these studies is that they are highly variable and so extrapolation from one study to another, or to other sources, such as those used by the Navy, creates challenges.

Based upon currently available data it is possible to predict specific effects of Navy impulsive sources on fish. There are several results that are at least suggestive of potential effects that result in death or damage. First, there are data from impulsive sources such as pile driving and seismic airguns that indicate that any mortality declines with distance, presumably because of lower signal levels. Second, there is also evidence from studies of explosives (Yelverton et al. 1975) that smaller animals are more affected than larger animals. Finally, there is also some evidence that fish without an air bubble, such as flatfish and sharks and rays, are less likely to be affected by explosives and other sources than are fish with a swim bladder.

For underwater demolition training, the effects on fish from a given amount of explosive depend on location, season, and many other factors. O'Keeffe and Young (1984) provides charts that allow estimation of the potential effect on swim bladder fish using a damage prediction method developed by Goertner (1984). O'Keeffe's parameters include the size of the fish and its location relative to the explosive source, but are independent of environmental conditions (e.g., depth of fish, explosive shot, and frequency content). Richardson et al. (1995) and Yelverton (1981) have also developed a methodology for estimating impacts; however these methods are based on a deep-water scenario, while the sites used in the SSTC have water depths typically no greater than 70 ft (21m). For a given charge weight, injury distances are often greater in shallow water than in deep water, because the impulse pressure changes are increased by reflections off the seafloor. On the other hand, impulse magnitude is lower the closer the receptor is to the surface, and in shallow water fish tend to be closer to the surface than in deep water. Young (1991) developed a method for estimating fish injuries from blasts in shallow water that typically calculates somewhat greater injury distances than Yelverton's method, which simulate a deep-water scenario:

$$R = 95\ W_f^{-0.13}\ W_e^{-0.28}\ (DOB)^{0.22}$$

In this equation, R is the distance in feet from blast to fish, $W_f$ is the weight of the fish in pounds, $W_e$ is the weight of the explosive in pounds, and DOB is the depth of the blast in feet. The fish are assumed to be in "shallow" water. This equation calculates the 90 percent survival range, and some injury and mortality could occur at greater distances. Table 3.8-9 lists the estimated 90% survival distance using Young's 1991 method for a range of fish sizes, depths, and explosive charges.

**Table 3.8-9: Estimated 90% Survival Distances (Feet) for a Range of Fish Weights, Charge Sizes, and Charge Depths***

| Fish Weight (lbs) | Depth (ft) | Explosive Charge (Pounds) | | | | |
|---|---|---|---|---|---|---|
| | | 3.5 | 5 | 10 | 20 | 29 |
| 0.1 | 20 | 352 | 389 | 472 | 573 | 636 |
| | 40 | 410 | 453 | 550 | 668 | 741 |
| | 60 | 448 | 495 | 601 | 730 | 810 |
| 0.5 | 20 | 285 | 315 | 383 | 465 | 516 |
| | 40 | 332 | 367 | 446 | 542 | 601 |
| | 60 | 363 | 402 | 488 | 592 | 657 |
| 1 | 20 | 261 | 288 | 350 | 425 | 471 |
| | 40 | 304 | 336 | 408 | 495 | 549 |
| | 60 | 332 | 367 | 446 | 541 | 600 |
| 5 | 20 | 212 | 234 | 284 | 345 | 382 |
| | 40 | 246 | 272 | 331 | 401 | 445 |
| | 60 | 269 | 298 | 361 | 439 | 487 |
| 10 | 20 | 193 | 214 | 259 | 315 | 349 |
| | 40 | 225 | 249 | 302 | 367 | 407 |
| | 60 | 246 | 272 | 330 | 401 | 445 |

*Based on Young 1991 and applies to fishes with swim bladders.

Underwater explosive testing was performed near SSTC-N at Naval Amphibious Base (NAB) in very shallow water (VSW) (15 feet) for similar conditions to the ROI (Naval Surface Warfare Center [NSWC]/Anteon Corp., Inc. 2005) to investigate the potential effect to marine mammals and turtles (discussed in Section 3.9.2.4.3). Pressure waves were measured at various radii for 2- and 15-pound explosions located on the bottom, mid-water, and on the surface. At NAB peak pressure (psi), values recorded for off-bottom charges were approximately 50 percent greater at both the mid and far range sensors than for the same sized charges placed on the bottom. For most of the test shots reported in the NSWC/Anteon Corp., Inc. (2005) testing the deepest gages showed the least pressure. This is contrary to typical detonations in the middle and upper part of the deeper water column that usually produce an increase in pressure and energy near the bottom at distance—because of combinations of direct and bottom-reflected pressure waves and refraction. In the very shallow water environment, the bottom slopes away moving into deeper water. Bottom or near bottom detonations may create a shadow zone along the bottom at distance—because of the general linear property of ray-paths. Given the non-linear degradation of impulse waves through sea water and the variability of bottom substrate and depth of the explosions, it is difficult to estimate the distance of no effect for all the possible ranges of detonations.

An effects distance can be determined for fish of similar size to species known to occur within the ROI by integrating impulse and peak pressure results from the underwater explosive testing performed by NSWC/Anteon Corp., Inc. (2005)—with effects criteria derived from Yelverton's (1981) empirical equation (Table 3.8-9). Goertner (1994) performed tests on fish with and without swim bladders: hogchokers (*Trinectes maculatus*) and summer flounder (*Paralichthys dentatus*). In the fish without swim bladders, the report shows that hogchokers, exposed to 10-pound underwater detonations at 30 feet, all sustained critical injury—severe hemorrhaging throughout body cavity, and/or gross kidney damage—or death. If it is assumed that the type of underwater detonation utilized in the Goertner study was similar to those tested in the NSWC/Anteon Corp., Inc. (2005) investigation, a peak pressure of approximately 1,000 psi can be estimated at the 30 feet distance for a 10-pound underwater detonation. With the severity of the injuries to fish exposed to 1,000 psi peak pressure without swim bladders, it can be assumed that at least 50 percent mortality would result. Summer flounder—fish without swim bladders—were also tested in the Goertner study; they sustained no injuries from the same 10-pound underwater detonations at distances as close as 6 feet. In contrast, Goertner (1994) reported results from a similar study performed on fish with swim bladders and determined that fish with swim bladders were susceptible to impulse effects 100 times greater than fish without swim bladders. Effects to fish from underwater detonations are dependent on species, weight, and impulse level.

#### 3.8.2.1.2 Acoustic Effects of Underwater Sounds to Fish

##### Sensitivity of Fish to Acoustic Energy

Fish have a variety of different sensory systems that enable them to gather information from the world around them (volumes by Atema et al. 1988 and by Collin and Marshall 2003 for thorough reviews of fish sensory systems). While each of the sensory systems may have some overlap in providing a fish with information about a particular stimulus, such as when an animal might see and hear a predator, different sensory systems may be most appropriate to serve an animal in a particular situation. Thus, vision is often most useful when a fish is close to the source of the signal in daylight, and when the water is clear. However, vision does not work well at night, or in deep waters. Fish can use chemical signals to indicate danger. However, chemical signals travel slowly in water: diffusion of the chemicals depends upon currents; further, chemical signals are not directional and may diffuse quickly to a non-detectable level. As a consequence, chemical signals may not be effective over long distances.

In contrast, an acoustic signal in water travels very rapidly, it travels great distances without substantially attenuating (declining in level) in open water, and its travel is highly directional. Thus, acoustic signals provide the potential for two distant animals to communicate quickly (reviewed in Zelick et al. 1999; Popper et al. 2003).

Since sound is a good way to gather information and communicate, fish have evolved two sensory systems to detect acoustic signals (Zelick et al. 1999 for review). The two systems are the ear, for detection of sound above 20 hertz (Hz) to 1 kilohertz (kHz) or more, and the lateral line for detection of hydrodynamic signals (water motion) from less than 1 Hz to 100 or 200 Hz. The inner ear in fish functions very much like the ear found in all other vertebrates, including mammals. The lateral line, in contrast, is only found in fish and a few amphibian (frogs) species. It consists of a series of receptors along the body of the fish. Together, the ear and lateral line are often referred to as the octavolateralis system.

##### Sound in Water

The physical principles of sound in water are the same as sound in air (see Rogers and Cox 1988; Kalmijn 1988, Kalmijn1989). Any sound source produces both pressure waves and actual motion of the medium particles. However, whereas in air the actual particle motion attenuates very rapidly and is often inconsequential even a few centimeters from a sound source, particle motion travels (propagates) much further in water due to the greater density of water than air. In the literature on fish hearing, the terms "acoustic near field" and the "acoustic far field" can be found, with the former referring to the particle motion component of the sound and the latter the pressure. There is often the misconception that the near field component is only present close to the source. However, all propagating sound in water has both pressure and particle motion components; but after some distance, often defined as the point at a distance of wavelength of the sound divided by 2 pi ($\lambda/2\pi$), the pressure component of the signal dominates, though particle motion is still present and potentially important for fish (e.g., Rogers and Cox 1988, Kalmijn 1988, Kalmijn 1989). For a 500 Hz signal, this point is about 0.5 m from the source.

The critical point to note is that fish detect both pressure and particle motion, whereas terrestrial vertebrates only detect pressure. Fish directly detect particle motion using the inner ear. However, pressure signals are initially detected by the gas-filled swim bladder or other bubble of air in the body. The air bubble then vibrates and serves as a small sound source which reradiates or resends the signal to the inner ear as a near field particle motion. The ear can only detect particle motion directly, and it needs the air bubble to produce particle motion from the pressure component of the signal.

If a fish is able to only detect particle motion, it is most sensitive to sounds when the source is nearby, due to the substantial attenuation of the particle motion signal as it propagates away from the sound source. As the signal level gets lower and further from the source, the signal ultimately goes below the minimum level detectable by the ear, the threshold. Fish that detect both particle motion and pressure are more sensitive to sound than are fish that only detect particle motion: the pressure component of the signal attenuates much less over distance than does the particle motion; although, both particle motion and pressure are always present in the signal as it propagates from the source.

One critical difference between particle motion and pressure is that fish pressure signals are not directional. Thus, for fish pressure does not appear to come from any direction (Popper et al. 2003, Fay 2005). In contrast, particle motion is highly directional and is detectable by the ear. Accordingly, fish appear to use the particle motion component of a sound field to gather information about sound source direction. This makes particle motion an extremely important signal to fish.

As both pressure and particle motion are important to fish, it becomes critical that in design of experiments to test the effects of sound on fish and fish hearing, the signal must be understood not only in pressure levels, but also in its particle motion component. This has not been done in most experiments on effects of human-generated sound to date, with the exception of one study on effects of seismic airguns on fish (Popper et al. 2005).

## What do Fish Hear?

Based on current knowledge, all fish are able to perceive lower frequency sounds, from below 50 Hz to 1,500 Hz, whereas some fish have developed accessory hearing structures enabling them to detect higher frequencies over 3,000 Hz (Fay 1988; Ramcharitar and Popper 2004). A select few are able to detect sounds over 120 kHz (Mann et al. 2001). Broadly, fish can be categorized as hearing specialists or hearing generalists (Scholik and Yan 2002).

Fish in the hearing specialist category, such as carp, catfish, and mormyrids, have a broad hearing frequency range with a low auditory threshold due to a mechanical connection between an air-filled cavity, such as a swim bladder, and the inner ear. Specialists detect both the particle motion and pressure components of sound and can hear at levels well above 1,000 Hz, whereas generalists are limited to detection of the particle motion component of low-frequency sounds at high sound intensities (Amoser and Ladich 2005). The best hearing sensitivity of many hearing generalists is at or around 300 Hz (Popper 2003).

Hearing specializations are most often found in freshwater species, while in marine species specializations are quite rare (Amoser and Ladich 2005). It can be argued that the evolution of hearing specializations was facilitated by low ambient noise levels found in lakes, slowly flowing waters, and the deep sea (Amoser and Ladich 2005; Ladich and Bass 2003; Popper 1980). This evolution most likely came about due to the essential need to detect abiotic noise, avoid approaching predators and detect prey, and to a much lesser degree, communicate acoustically (Amoser and Ladich 2005; Fay and Popper 2000).

If the sound is loud enough and within the range of frequencies a fish can hear, a sound will be detected by a fish at some distance from the source. Because of the variable hearing thresholds summarized above, this distance varies among species. Theoretically, a yellowfin tuna (*Thunnus albacores*) would need to be much closer than an Atlantic cod (*Gadus morhua*) to hear a low-frequency sound at a given energy level.

Studies in reference to effects on hearing have been of two types. In one set of studies, the investigators exposed fish to long-term increases in background noise to determine if there are changes in hearing, growth, or survival of the fish (Wysocki and Ladich 2005). While data are limited to a few freshwater species, it appears that some increase in ambient noise level, even to above 170 dB re 1 μPa does not permanently alter the hearing ability of the hearing generalist species studied, even if the increase in sound level is for an extended period of time. However, this may not be the case for all hearing generalists, though it is likely that any temporary hearing loss in such species would be considerably less than for specialists receiving the same noise exposure.

There is a small group of studies that discusses effects of high intensity sound on fish, where fish were exposed to short duration but high intensity signals, such as might be found near underwater detonations, pile driving, or seismic air gun surveys. The investigators in such studies were examining whether there was not only hearing loss and other long-term effects, but also short-term effects that could result in death to the exposed fish. However, as discussed in Hastings and Popper (2005), much of this literature has not been peer reviewed, and there are substantial issues with regard to the actual effects of high intensity sounds on fish. Popper et al. (2005) examined the effects of exposure to a seismic air gun array on three species of fish found in the Mackenzie River Delta near Inuvik, Northwest Territories, Canada. The species included a hearing specialist, the lake chub (*Couesius plumbeus*), and two hearing generalists, the northern pike (*Esox lucius*), and the broad whitefish (*Coregonus nasus*) (a salmonid). In this study, fish in cages were exposed to 5 or 20 shots from a 730 cubic inch calibrated air gun array. Received Exposure Levels (RL) were determined for root-mean-square (RMS) sound pressure level, peak sound levels and SELs (e.g., average mean peak SPL 207 dB re 1 μPa RL; mean RMS sound level 197 dB re 1 μPa RL; mean SEL 177 dB re 1 $\mu Pa^2 s$).

The results showed a temporary hearing loss for both lake chub and northern pike, but not for the broad whitefish, to both 5 and 20 air gun shots. Hearing loss was on the order of 20 to 25 dB at some frequencies for both the northern pike and lake chub, and full recovery of hearing took place within 18 hours after sound exposure. While a full pathological study was not conducted, fish of all three species survived the sound exposure and were alive more than 24 hours after exposure. Those fish of all three species had intact swim bladders and there was no apparent external or internal damage to other body tissues (e.g., no bleeding or grossly damaged tissues), although it is important to note that the observer in this case was not a trained pathologist. Recent examination of the ear tissues by an expert pathologist showed no damage to sensory hair cells in any of the fish exposed to sound (Song et al. submitted).

A critical result of this study was that it demonstrated differences in the effects of air guns on the hearing thresholds of different species. In effect, these results substantiate the argument made by Hastings et al. (1996) and McCauley et al. (2003) that it is difficult to extrapolate between species with regard to the effects of intense sounds.

There have been a number of studies that suggest that the sounds from pile driving, and particularly from driving of larger piles, kill fish that are very close to the source. The source levels in such cases often exceed 230 dB re 1 μPa (peak) and there is some evidence of tissue damage accompanying exposure (e.g., Caltrans 2001, 2004; reviewed in Hastings and Popper 2005). However, there is reason for concern in analysis of such data since in many cases the only dead fish observed were those that came to the surface. It is not clear whether fish that did not come to the surface survived the exposure to the sounds, or died and were carried away by currents. The Fisheries Hydroacoustic Working Group (2008) developed an interim criteria for injury to fish from pile driving activities. The criteria identify sound pressure levels of 206 dB peak and 187 dB accumulated sound pressure level (SEL) for all listed fish except those that are less than 2 grams. In that case, the accumulated SEL will be 183 dB.

In summary, the lethal and sublethal effects of noise on fish is variable among species and the source of noise, and considering the limited availability of pertinent literature and the absence of specific investigations on species known to occur within the ROI, use of sound levels (dB re 1 μPa RL) should be carefully utilized when accessing potential effects.

#### 3.8.2.1.3 Disturbance- Behavioral Responses to Acoustic Energy

Underwater sounds have been used by fishermen to guide herring and other schooling fish to their nets (Yelverton 1981), or to exclude fish from water intakes (Haymes and Patrick 1986). The noises made by fishing boats can scare some target fish. Sudden changes in noise level can cause fish to dive or to avoid the sound by changing direction. Time of year, whether the fish have eaten, and the nature of the sound signal may all influence how fish will respond to it.

Short, sharp sounds can startle herring. In one study, the fish changed direction and moved away from the 80–92 Hz source, but schooling behavior was not affected (Blaxter et al. 1981). Schwarz and Greer (1984) studied the responses of penned herring to sounds. The experimental pen was 3.3 meters long on each side. The following responses were noted (Schwarz and Greer 1984):

- Avoidance - fish moved slowly away from the sound source.
- Alarm - the school packed, fled at high speed, dove repeatedly, and quickly changed directions.
- Startle - fish flexed their bodies powerfully and then swam at high speed without changing direction, or shuddered with each blast (the last noted by Pearson et al. 1992).

The low-frequency (<2 kHz) sounds of large vessels or accelerating small vessels usually caused an initial avoidance response among herring. The startle response was observed occasionally. Avoidance ended within 10 seconds of the “departure” of the vessel. After the initial response, 25 percent of the fish groups habituated to the sound of the large vessel and 75 percent of the responsive fish groups habituated to the sound of the small boat. Chapman and Hawkins (1969) also noted that fish adjust rapidly to high underwater sound levels.

Pearson et al. (1992) conducted a controlled experiment to determine effects of low-frequency (mostly <500 Hz), strong noise pulses on several species of rockfish off the California coast. They used an air gun with a source level of 223 dB re 1 μPa. They noted:

- Startle responses at received levels 200 to 205 dB re 1 μPa and above for two sensitive fish species (olive and black rockfish), but not for two other species exposed to levels up to 207 dB.
- Alarm responses at 177 to 180 dB for the two sensitive species, and at 186–199 dB for other species.
- An overall threshold for the above behavioral response at ~180 dB.
- An extrapolated threshold of approximately 161 dB for subtle changes in the behavior of rockfish that included reduced catch ability in a hook and line fishery (Skalski et al. 1992).
- A return to pre-exposure behavior types within the 20 to 60 minute exposure period.

Popper et al. (2005) exposed three freshwater fish species (northern pike, broad whitefish, and lake chub) to 20 air gun shots over 15 minutes at peak received levels >205 dB re 1 µPa. There were no apparent physical effects, and a temporary shift in hearing sensitivity (Temporary Threshold Shift, TTS) was found in only two of the species, with recovery within 24 hours of exposure.

Experiments conducted by Skalski et al. (1992), Dalen and Raknes (1985), Dalen and Knutsen (1986), and Engas et al. (1996) demonstrated that some fish were forced to the bottom and others driven from the area in response to low-frequency air gun noise. The authors speculated that catch per unit effort would return to normal quickly in their experimental area because behavior of the fish returned to normal minutes after the sounds ceased.

Aircraft overflights occur within the ROI on a daily basis and helicopter activities below 1,000 feet above ground level. Sound does not transmit well from air to water. The sound levels resulting from an HH-60 helicopter flying at 1,000 feet flying at 100 feet, and hovering at 10 feet were 110, 129, and 143 dB re 1 µPa, respectively, directly under the helicopter at a depth of 1 foot (USAF 1999). Sound levels decline at increasing lateral distances from the aircraft's track or location and with increasing depth in the water. The underwater sounds originating from the aircraft decline rapidly after the aircraft has passed. It is unlikely that these sound levels cause physical damage or even behavioral effects in fish, based on the sound levels that have been found to cause such effects. Effects of underwater noise attributed to aircraft overflights on fish would be minimal.

In summary, fish often react to sounds, especially continuous strong and/or intermittent sounds of low frequency (<1 kHz) at received levels of 160 dB re 1 µPa and higher. The Fisheries Hydroacoustic Working Group (2008) developed an interim criteria for behavioral disturbance to fish from pile driving activities, which listed the behavioral disturbance threshold at 150 dB RMS. Low-frequency pulses at levels of 180 dB may cause noticeable changes in behavior, such as an alarm response and lowered catch ability (Chapman and Hawkins 1969; Pearson et al. 1992; Skalski et al. 1992). These sounds are 80 to 100 dB over and above the fish's hearing threshold. It appears that fish often habituate to repeated strong sounds rather rapidly, on time scales of minutes to an hour or so. However, the habituation does not endure, and resumption of the disturbing activity may again elicit disturbance responses from the same fish. However, while behavior modification of fish from mechanically propelled vessels may occur, the level of disturbance is primarily categorized as avoidance (Schwarz and Greer 1984).

The Glacier Bay Underwater Noise – Interim Report investigated sources of underwater noise and sound levels of all types of ships and/or small craft transiting Glacier Bay, Alaska. The types of vessels categorized in the NSWC study were similar to those utilized for SSTC actions within the ROI. The study reported that only about one percent of noise samples collected contained marine vessel noise levels exceeding 120 dB and no vessel noise levels exceeded 130 dB at the hydrophone (NSWF, 2002). Expected noise levels of vessels used in the ROI would be less than those shown to provoke strong behavioral responses. Sound events resulting in avoidance behavior are not expected to have a long-term adverse impact on health or survival or a lasting disruption of behavioral patterns (such breeding, feeding, or sheltering) from such temporary and transitory sound events.

To facilitate inert mine recovery, high-frequency (35 to 43 kHz) pingers are occasionally attached to mines. The source level of the acoustic pinger is 70 - 75 dB re 1 µPa-m and these high frequency sounds attenuate rapidly in seawater, which is below the behavioral threshold. Location pingers for inert mines do not constitute an adverse effect on the physiology and behavior of marine mammals and are not carried forward in this EIS. Additionally, underwater exercises involving Navy divers include an underwater notification system alerting divers to return to boats or shore to conclude exercises. The noise associated with the Audible Recall Device (ARD) is broadband, though most energy is concentrated between 200 and 300 Hz. The duration of a diver recall device is one second or less and propagation models indicate that levels drop to below 2 psi·sec within 23 feet of the source. The ARD is only used at periodic intervals when needed to alert or recall underwater divers and do not represent a continuous acoustic source. Disturbance effects on the behavior of fish, if any, would be extremely localized and short-term on the order of seconds to minutes. Potential avoidance behavior constitutes a minor and temporary change in behavior, with no adverse effect to overall behavior patterns. Therefore, while pingers and recall devices are utilized under all alternatives, no impacts are expected from their use and will not be carried forward in this EIS analysis.

#### 3.8.2.1.4 Habitat Modification

Natural disturbances are important agents of change in ecosystems. Various characteristics, such as spatial scale and time of disturbance, result in differential abilities of species (and ecosystems) to respond (Allen et al. 2006). In the context of activities taking place within the ROI and their potential to physically modify fish habitat both short and long term, the area of disturbance (i.e. habitat) is critical when evaluating effect. The partitioning and terminology used to define waters within the ROI are important in order to describe the region as well as the areas of potential effect within both the bayside and oceanside training areas. The oceanographic term nearshore describes a regional area from the land/sea interface to deeper waters over the continental shelf out to approximately 1,000 feet in depth. While the ROI encompasses both San Diego Bay and nearshore ocean waters the majority of potential effects from activities are focused on shallow areas described as intertidal areas, mudflats, or surf zone. In order to discuss interactions between these areas and activities the term surf zone will refer to the land/sea interface within the ocean training areas out to approximately -10 feet MLLW and mudflats, intertidal areas, or eelgrass will refer to areas within San Diego Bay from -10 feet MLLW to the high tide mark. Surf zone habitat is constantly changing to some degree based on longshore sand transport and wave action; the fish species residing there have adapted to habitat modification and take advantage of opportunities. In contrast, mudflats and eelgrass habitat within the San Diego Bay is in a somewhat steady state in comparison to the surf zone; several fish species occupy small home ranges and depend on the persistence of eelgrass to maintain their existence. Specific studies investigating bottom disturbance from watercraft operating near or landing on sandy beaches, intertidal areas, mudflats, or eelgrass are not available; thus, affects analyses can only be estimated in relative terms based on the size of the marine vessels accessing these areas and the duration of the activity.

Fish habitat in the near coastal marine environment is segregated based on depth, type, and complexity of the substrate fish associate with. Fish species associated with hard bottom/rocky reef areas have smaller home ranges and defined habitat criteria than species associated with soft bottom areas. Effects on fish with regard to habitat modification within soft bottom (sand) areas of southern California are not comprehensive and studies have primarily focused on habitat modification within kelp forests or rock reef areas. The majority of studies evaluated changes in macroalgae cover or density and the relationship to effects on fish densities and species diversity. Studies investigating habitat modification with regard to vessel anchoring or mooring have focused on coral reef environments. Thus, potential effects from SSTC activities within the nearshore coastal marine environment related to fish habitat modification will be centered on the type of interaction the activity has with the bottom substrate and the type and complexity of that substrate. Potential effects to fish assemblages will be based on the fish species common to that substrate and densities or relative abundances documented for that area.

### 3.8.2.2 No Action Alternative

The No Action Alternative would maintain the current level and types of training that occur in the ROI. Current mitigation measures would remain unchanged. This section focuses on only groups of activities that have the potential to result in an impact to specified fish species (As discussed previously, similar types of activities are grouped together to facilitate effects analysis). Types of activities that could affect fish include aircraft activities (related to sound propagation into the water column), marine vessel activities, underwater detonations, and amphibious activities. In addition, beach and inland activities have minimal or no potential for impact to fish in areas within the SSTC study area, as these areas are removed from aquatic habitats.

#### 3.8.2.2.1 Air Activities

Air activities consist of Unmanned Aircraft System training, as well as, helicopter take offs, landings, and activity practice. Under the No Action Alternative, there are 10 activities that involve aircraft training. Many of the training activities utilize helicopters to transport and deploy equipment and individuals into the water, where personnel either swim to shore or perform activities in the water. While the majority of helicopter activities occur at distances too far above the water to influence fish communities, a proportion of activities occur in close proximity (less than 300 feet above ground level.) to the water's surface.

Helicopters deploy personnel and equipment in oceanside training lanes (Activities 4, 6, 7, 12, 16, 25, 26, 28, 29, 30, 35, 37, 64, Table 2-1). Helicopter activities would have the greatest impact when flying low and hovering at altitudes down to 100 feet. Noise modeling indicates that the predicted SEL at a depth of 1 foot resulting from the overflight of an HH-60 helicopter at 100 feet would be approximately 100 to 118 dB re 1 μPa (frequencies of 20 Hz and 5 kHz) with peak sound levels potentially reaching 129 dB re 1 μPa (USAF, 1999). Low elevation hovering during these activities would not have physical effects on fish under the surface of the water based on these sound levels and effects criteria. Effects criteria developed in the previous Section 3.8.2.1.2 suggest that some behavior modifications related to noise may occur but are unlikely, as underwater hearing ability of fish is not considered sensitive enough to detect the noise associated with helicopter overflights and hovering and behavioral studies have indicated that response thresholds are extremely high, greater than 180 dBA.

Any physical or behavioral effect, however infrequent, would be temporary and infrequent based on the variability of fish residing near the water's surface in SSTC-N and SSTC-S and the number of activities performed per year. Aircraft landings on shore within bayside training areas would have localized disturbance and habitat modification potentially affecting fish foraging within eelgrass habitat. Effects from San Diego Bay landings would be temporary and localized considering the dynamic nature of the intertidal habitat, the short duration the action takes place within the habitat, and the probability that fish would be present at the time of the action. Disturbance of fish from the noise, physical presence, or sea surface disturbance from aircraft within the ROI would be limited to fish utilizing the area immediately adjacent to the action and likely only within the uppermost section of the water column. Reduced foraging success or behavior modification attributed to air actions is not likely to occur according to findings previously presented. Any temporary effect to fish near the surface remains a low probability considering the temporal variability of both training actions and the potential for fish to be present near the sea surface within a specific training area.

#### 3.8.2.2.2 Marine Vessel Activities

Marine vessel use in the ROI consists of non-mechanically propelled boats, propeller surface craft, and water jet driven craft. Non-mechanically propelled craft are used by trainees to navigate in San Diego Bay and ocean waters, as well as, for transportation to shore for training activities. Interactions between personnel/craft and fish, which are anticipated to be rare and innocuous, such as swimming or activities that utilize only non-motorized CRRCs, are excluded from individual activity analysis as potential impacts from interactions would be minimal to non-existent. Under the No Action Alternative, marine vessels both mechanically driven and self-propelled are utilized in 41 of the 78 training activities (Activities 1- 3, 5 -14, 16, 18, 20 - 28, 32 - 35, 37 - 41, 44 - 46, 49, 51 - 53, 57, 77, 78, Table 2-1). Potential effects from these activities on EFH are detailed in Section 3.7.2.2.

Propeller surface craft are used for a variety of purposes in the ROI. Propeller surface craft are used in entirely water-based activities, where trainees practice navigation, mock boat attacks, and boarding drills.

These craft are also used to transport people or equipment to shore for raids or activities, as safety support for swimmers during physical fitness training, and to transport marine mammals for training. Under the No Action Alternative, training activities involve propeller- and jet-driven surface craft of various size and speed. Activities occur in both San Diego Bay and oceanside training lanes and to varying degrees involve landing on beaches in both areas.

Effects on fish from marine vessels either mechanically driven or self-propelled operating within the ROI include physical impacts, sound, visual disturbance, and habitat modification. Because of the variable hearing thresholds among fish species the distance at which they are affected can vary. Sudden changes in noise level can cause fish to dive or to avoid the sound by changing direction. The density of the water column (water, temperature, turbidity), time of year, whether the fish have eaten, and the nature of the sound signal may all influence how fish respond to sound or movement (Schwarz and Green 1984). Marine vessels utilized during various training activities land on beaches and San Diego Bay shorelines that support fish assemblages. The modification of intertidal habitat depends on the size of the marine vessel, the frequency of the landings within the area, and whether the propulsion system creates scouring during the landing activity.

Effects on fish species from noise, physical interaction, or habitat modification attributed to small marine vessels (<40 feet) operating within the ROI would be minimal. Small mechanically driven vessels do not emit noise levels documented to cause substantive behavioral or physiological effects nor does the water intake associated with the engine utilize sufficient water to entrain adult fish or detrimental quantities of fish larvae or eggs. Behavior modification of fish species interacting with small marine vessels both mechanically driven and self-propelled would be minimal considering the low population densities of fish within the training areas, 0.81 individuals/$m^2$ for the South-Central portion of San Diego Bay (Allen 1999), compared to the regional setting (1.75 individuals/$m^2$ for all regions of San Diego Bay) and the temporal and spatial variability of fish species and individual activities. Reduced foraging success, disturbance from behavior modification, or habitat modification attributed to self-propelled or small mechanically driven vessel activities are not likely to occur, based on the effects criteria presented in Section 3.8.2.1 (Approach to Analysis) and the short duration and spatial extent of activities within sensitive intertidal habitat. Activities involving small marine vessel used in support of diving, swimming or training which do not come in contact with marine substrates (Activities 2, 3, 5 - 12, 14, 18, 21, 23, 26, 28, 34, 35, 57, 77, or 78, Table 2-1) are anticipated to have little to no effect on fish species present based on effects criteria discussed in Section 3.8.2.1 regarding noise effects, behavioral modifications, or physical injuries.

Effects on fish species from noise, physical interaction, or habitat modification attributed to large mechanically driven vessels operating over open water within the ROI would be minimal based on effects criteria in the approach to analysis. However, large mechanically driven craft operating under power during landing activities may have effects on fish when landing activities occur within the San Diego Bay over eelgrass beds. For instance, a Landing Craft Air Cushion (LCAC) is a large craft powered by four gas turbine engines that uses fans to hover above the water. Its footprint includes its physical structure plus the area surrounding it, which is affected by the strong wind it produces. An LCAC approaches the beach and comes ashore up near the crest of the beach. Hovercraft were recorded in the frequency ranges of 80 to 630 Hz with source level of up to approximately 110 dB re 1 μPa and 50 to 2,000 Hz with a source level up to 121 re 1 μPa (Richardson et al. 1995). Recordings of a Griffon 2000TD hovercraft passing a hydrophone at full power in Prudhoe Bay, Alaska indicated broadband (10-10,000 Hz) levels reaching 133 dB re 1 μPa (Blackwell and Greene 2005), with most spectral energy centered around 87 Hz. The noise associated with LCAC activities is below those associated with behavioral disturbance thresholds in fish, but still possesses the potential for localized disturbance effects to fish.

Other direct effects to fish species from LCACs are similar to other marine surface vessels, as described below, but are reduced due to the relative infrequency of the activity (four per year). Designed to land on beaches, LCAC training activities are concentrated at oceanside training areas of SSTC. Previous bathymetric and biological surveys performed within the nearshore waters off Imperial Beach describe a physically disturbed area that oscillates between ephemeral kelp bed and sand/cobble bottom. The habitat contained within the offshore training lanes where LCAC activities take place is dominated by sand/cobble bottom. LCACs hover above the water and produce a large surface disturbance. However, LCACs likely only have a direct effect on fish immediately below the LCAC or in extremely shallow water. LCAC activities have minimal effect to fish and their associated subtidal habitat.

Jets and propellers for other marine vessels operating continuously over a sustained time period may excavate fish burrows and alter foraging and behavior of resident fish species. Large boat landings, primarily Landing Craft, Utility and Landing Craft, Mechanized are constrained to landing (beaching) to SSTC-N and SSTC-S boat and beach lanes and Bravo within the bay training areas. Effects from crushing during large vessel landings may have localized effects, although it's probable that both excavation and crushing effects from large vessel landings would be localized and overall species assemblages unaffected considering the spatial extent of adjacent habitat and infrequent (less than 200 activity days/year within all defined landing areas) nature of the activities. Behavior modifications of fish species interacting with large mechanically driven vessels would be minimal considering the habits and movement patterns of the most abundant fish within the training areas (northern anchovies, slough anchovies and top smelt) compared to the regional setting and the temporal and spatial variability of the individual large ship activities. Reduced foraging success or behavior modification attributed to large mechanically driven vessel activities is not likely to occur based the lack of disturbance effects and the short duration and spatial extent of activities within the intertidal habitat. Marine vessel activities in the SSTC ROI do not physically disrupt behavior or migration patterns of fish species. Marine vessel activities in the SSTC ROI would not measurably alter the water or sediment quality from debris or discharge sufficient to impact EFH. Based on the extent, duration, and magnitude of potential impacts from SSTC marine vessel training activities, there be an adverse impact of eelgrass habitat in San Diego Bay. The Navy currently maintains a signed agreement with the Army Corps of Engineers and NOAA Fisheries (i.e., Banking Instrument; N00242-080624-X42-MOA; DoN 2008) to mitigate or compensate impacts to eelgrass habitat, and any impacts to eelgrass within the designated training lane within Bravo training area will be offset by the NEMS, as discussed in Section 3.7.1.5.

#### 3.8.2.2.3 Underwater Detonations

Underwater detonations taking place under the No Action Alternative are detailed below (Table 3.8-10). Training activities involving their use are described in Chapter 2 (Activities 6, 7, 10, 11, 12, Table 2-1). Under the No Action Alternative, all detonations occur in the oceanside training lanes within designated boat lanes 1-14. Detonations occur in water depths ranging from 0 to 72 feet depending on the activity.

The effect to fish species within a ZOI from detonations can only be evaluated in general terms due to the diversity of species that may occur within lethal impulse distances and the unknown density and probability of each species occurring within the ROI. While fish assemblages, occurrences, and density is documented for the San Diego Bay (Allen 1999, Allen et al. 2006 and Pondella et al. 2006), and likely fish assemblages identified for the coastal surf and pelagic zones adjacent to SSTC (Allen et al. 2006), the exact densities of fish within the water column in the oceanside portion of the SSTC ROI is less well documented. Most fish are relatively mobile in their distribution over short time and space scales. Fish movement and occurrence is affected by a number of factors including, but not limited to, tidal conditions, long and short-term oceanographic variations, seasonal variations, species specific life history variations, etc.

The threshold for 1% mortality from an underwater detonation varies by fish species (Table 3.8-9). It is estimated to be at the point where impulse waves measure below 69 Pa·s (10 psi-ms) for gobies and 116 Pa·s (16.8 psi-ms) for Pacific sardines, the most impulse sensitive fish species within the ROI. Other species have impulse thresholds greater than 145 Pa-s (21.0 psi-ms).

Modeling was conducted to determine potential effects of underwater detonations on marine mammals (Section 3.9.2.4 for a detailed discussion of the modeling effort). The modeling calculated the zone of influence (ZOI) from each SSTC underwater detonation to the onset of severe lung injury in marine mammals, which is a received pressure of 13.0 psi-ms (Table 3.9-5). The maximum ZOI to the 13.0 psi-ms threshold for the largest charge (20 lbs mine countermeasure charge) is 360 yards. Combining the static nature of underwater detonations and the high mobility and variability of fish species within the nearshore coastal area of the ROI, the magnitude of the detonation would be the greatest factor affecting the area of potential effect.

**Table 3.8-10: Underwater Explosive Activities Conducted during the No Action Alternative**

| Activity Number | Underwater Detonation | NEW[1] (lb) | Number of Detonations | Water Depth | Charge Depth | Tempo | Location |
|---|---|---|---|---|---|---|---|
| 5 | MCM[2] | 10 to 20 | 1/ op | ≤ 72 | Mid-water | 16 ops/yr | Boat Lanes 1 - 14 |
| 5 | MCM | 10 to 20 | 1/op | ≤ 72 | Bottom | 16 ops/yr | Boat Lanes 1 - 14 |
| 6 | Floating Mine | ≤ 5 | 1/op | ≤ 72 | Surface (< 5 feet) | 25 ops/yr | Boat Lanes 1 - 14 |
| 7 | Dive Platoon* | 3.5 | 8/op | 10 – 72 | Mid-water to Bottom | 8 ops/yr | Boat Lanes 1 - 14 |
| 9 | VSW MCM | 0.1 to 20 | 1/op | ≤ 24 | Bottom | 60 ops/yr | Boat Lanes 1 - 14 |
| 10 | UUV[3] Ops | 10 to 15 | 1/op | 10 ≤ 72 | Bottom to 10 feet from surface | 4 ops/yr | Boat Lanes 1 - 14 |
| 11 | MMS[4] Ops | 13 | 2/op | 10 ≤ 72 | Bottom | 8 ops/yr | Boat Lanes 1 - 14 |
| 11 | MMS Ops | 13 | 1/op | 24 ≤ 72 | Bottom to 20 feet from surface | 8 ops/yr | Boat Lanes 1 - 14 |
| 12 | Mine Neutral* | 3.5 | 8/op | 30 – 72 | Bottom | 4 ops/yr | Boat Lanes 1 - 14 |
| 37 | SDV/ASDS | < 10 | 1/op | ≤ 24 | Bottom to Mid-water | 14 ops/yr | Boat Lanes 1 - 14 |

Charges and are presented in terms of NEW in pounds.
[1]NEW: Net Explosive Weight; [2]MCM: Mine Counter Measures; [3] UUV: Unmanned Underwater Vehicle; [4] MMS: Marine Mammal Systems;
* Note - Most training events are a single detonation (i.e., 1/op) per event. However, several training activities involve sequential charges during the same training event. Unless otherwise specified, all sequential charges are conducted either less than 10-seconds apart or greater than 30-minute apart.

For purposes of this analysis, fish density within the nearshore ocean coastal areas of SSTC was assumed as similar to be similar to the lowest density ecoregion of San Diego Bay (0.08 /square feet) (Allen 1999, Allen et al. 2006). Based on this assumption, a total of 80 fish could reside within 1,000 square feet of near-coastal habitat. The degree of impact for each fish species can be estimated to some extent using reasonable assumptions of the blast effects radius for various detonation sizes, and the number and type of fish likely to be present within defined habitat types. However, the majority of detonations occur in habitats in the SSTC oceanside boat lanes that are lower in quality than those in the San Diego Bay. Combined with the population sizes and dispersed nature of potentially affected fish populations in the oceanside boat lanes, it is likely that this assumption overestimates the density of fish that would be in the area, possible by an order of magnitude, and thus calculations on zones of impact are used in this assessment, rather than assumed fish densities. In summary, small fish with swim bladders (< 0.5 pounds) in close proximity to underwater detonations would sustain lethal impact 1 percent of the time (LD 1) when exposed to greater than 116 Pa·s (16.8 psi-ms) impulse according to Yelverton (1981).

The variable impact to fish is species dependent (swim bladder versus no swim bladder), and it is conservative to assume that small fish (i.e. Pacific sardines < 0.5 pounds) within 360 yards (1080 feet) of the largest underwater detonation would suffer 1 percent mortality, according to effects criteria defined in Table 3.8-9 and in Section 3.8.2.1.1. Realistically it can be assumed that nearly half the fish in the area surrounding an underwater detonation do not have swim bladders and would not likely be affected outside of immediate area of the blast (30 ft), based on Goertner (1994) and a substantial portion of the fish would be greater than 0.5 pounds and would be effected to a much lesser degree.

Fishes known to reside and transit the nearshore ocean portion of the ROI utilized for underwater detonations (waters contained within boat lanes less than 72 feet MLLW) are variable in both time and space. Fish most susceptible to impulse injuries from SSTC underwater detonations (pacific sardines, northern anchovies, and top smelt) are extremely abundant (Allen 1999 estimated that 42 million northern anchovy reside in San Diego Bay) vary seasonally and inhabit a large geographic area that extends from Canada to Mexico. Resident and diurnal transients such as California halibut, croakers, bass, and various elasmobranches (sharks and rays) are not documented to be present in high densities within the ocean portions of the ROI and due to their size would be less susceptible to injury. For example, a 9 pound kelp bass would have an LD 1 of approximately one third the distance from the center of the same detonation as a Pacific sardine, resulting in an effect area of only one tenth that of smaller fish.

Overall impacts to specific fish species and assemblages under the No Action Alternative would remain temporary and localized considering the expansive nature of the adjacent habitat, the population size and dispersed nature of potentially effected fish populations, and the frequency of the largest underwater detonation activities (less than 32 20 lb detonations per year). In addition, underwater detonation activities in the SSTC ROI would not measurably disrupt behavior or migration patterns of fish species so as to impact populations of fish species.

As discussed in Section 3.7.2.2.2, underwater detonation activities in the SSTC ROI would not measurably alter the water or sediment quality from debris or discharge sufficient to impact EFH. Modifications to benthic habitat from detonations placed on the bottom occur infrequently and only within the SSTC ocean training lanes. Benthic habitat within the SSTC ocean training lanes is dominated by a physically dynamic sandy/cobble bottom that is both expansive and limited in EFH value. Adverse effects to EFH and to fish in general from underwater detonations activities would be temporary, localized, and minimal, there would be no lasting effects to populations, prey availability, or the food web. As a result of the analysis presented above as well as in Section 3.7, no adverse affects to EFH are anticipated.

### 3.8.2.2.4 Amphibious and Beach Activities

Training activities encompassed in this section included amphibious vehicles, Elevated Causeway System (ELCAS), and fluid transfer systems. Training activities include the use of training areas within both San Diego Bay and the nearshore environment. Potential effects from these activities include vehicle transit within ROI waters, noise, and habitat modification similar to those described in Section 3.8.2.2.2, Marine Vessel Activities. Potential effects from these activities on EFH are detailed in Section 3.7.2.2.

#### Amphibious Activities

Amphibious vehicles utilized during various training activities (Amphibious Assault Vehicle [AAV] and others) land on beaches and San Diego Bay shorelines that support fish assemblages. The modification of that shoreline depends on the size of the amphibious vehicle, the frequency of the landings within the area, and whether the propulsion system creates scouring during the landing activity. Amphibious activities analyzed in this section focus on the interaction the vehicle or training activity has within the landing area and, to a lesser extent, the waters adjacent to the landing areas.

*Amphibious Vehicles*

Amphibious vehicles, specifically AAV's, are involved in activities that perform landings in beach side training lanes in SSTC-N and SSTC-S. The surf zone habitat within the beach side training lanes is comprised of primarily coarse sand and supports transient fish. Amphibious vehicle landings interface with the bottom substrate at various levels depending on the tide but would not be expected to adversely impact fish habitat or fish. The surf zone habitat of the beach side training lanes is exposed to the predominant wind and wave direction and sediment in continually redistributed on both a daily and seasonal bases. Considering the limit draft (< 5 feet) of the AAV and small size (< 30 foot length) of the vehicles in conjunction with the steep slope of the beach throughout the SSTC-N and SSTC-S, bottom disturbance would be limited and not expected to adversely impact fish habitat. Fish utilizing the landing areas would not be expected to encounter adverse effects attributed to disturbance and would more likely take advantage of the sediment displaced or suspended by the vehicles for opportunistic feeding of liberated invertebrates.

*Elevated Causeway System*

During ELCAS training (Activity 42, Table 2-1) a temporary pier is erected using floating causeway sections and a pile driver that drives 24-inch hollow steel piles into the surf zone to secure the piles in place. After conclusion of the activity, the pier is deconstructed and the pilings are removed by vibrating the piles to loosen, and then extract them. Causeway activities occur primarily on SSTC-N oceanside boat training areas 1-10, but also periodically in the bayside training area Bravo. This activity occurs during two separate training events per year annually, up to 14 days per event under the No Action Alternative. Activities involve accessing beach areas through the surf zone using floating and land-based heavy equipment. The ELCAS pier is typically 1,200 feet in length at SSTC due to bathymetry and depth requirement of ships docking alongside the pier. ELCAS pier piles are driven every 40 feet with the exception of the first and last causeway sections where four piles are utilized rather than two piles.

Shock pulses from pile driving have the potential to affect fish in the immediate area and could have lethal effects if fish venture in close proximity. Depending on the level of the sound and shock waves produced by piling driving activities and the distance individual fish species are in proximity to the pile, various lethal and sublethal effects may occur. Previous studies discussed earlier in this section place lethal levels at above 230 dB and other deep water studies identify 180 dB as the disturbance effects level for rockfish. Considering the complexity and magnitude of associated logistical aspects of ELCAS, the majority of fish species within the activity area are likely to be displaced prior to pile driving activity. In some cases, specific opportunistic surf zone fish species (e.g., perch, topsmelt) may be attracted to the suspension of particulate matter and entrained food items liberated by the large vessels and heavy equipment used during ELCAS activities and would likely be susceptible to a greater degree of effect from the pile driving.

Sound impulses generated by pile driving attenuate at various rates depending on the depth, type of substrate, and size of the piling being driven. Hastings and Popper (2005) provide a brief summary of numerous measurements in the San Francisco Bay Area. Large diameter cast-in-steel-shell (CISS) piles driven with impact hydraulic hammers result in the greatest sound exposure. Timber piles that are driven with small hammers produce low amplitude sound pressure levels of less than 180 dB re 1 μPa (peak) at 33 feet from the pile. Twenty-four-inch concrete piles produced peak sound pressures of about 188 dB re 1 μPa, also at 33 feet from the pile. The larger CISS piles (i.e., 30-inch diameter or greater) produce much greater sound pressures. For instance, 30-inch diameter CISS piles driven with a diesel impact hammer produce 208 dB re 1 μPa (peak) at 33 feet from the pile and very large (96-inch diameter) CISS piles produce levels in excess of 220 dB re 1 μPa (peak) within 33 feet of the pile. Close to CISS piles, the RMS (impulse) is about 10 to 15 dB lower than the peak and the SEL is about 24 to 28 dB lower than the peak. Assuming the use of a 24-inch steel pile, shockwaves and peak pressures generated from ELCAS pile driving activities would be below the interim injury criteria and could be expected to be between 180 and 200 dB re 1 $\mu Pa^2$-s within 30 ft of pile driving, the upper limits of which reach behavioral disturbance threshold levels and mortality for some small fish possessing swim bladders (Goertner 1994, Yelverton 1981).

ELCAS activities within San Diego Bay at Bravo beach have a greater potential for effect to fish species because eelgrass habitat is known to occur within and adjacent to the activity area. Fish identified to inhabit eelgrass habitat vary widely but several species (gobies, pipefish) inhabit burrows or maintain defined home ranges within specific areas. Effects from ELCAS activities including sound, shock waves, habitat modification, and increased turbidity would have lethal and sub lethal effects to some fish species in the eelgrass areas. Suspended material from pile driving or vibratory pile removal within the oceanside training areas would not substantially modify the surf zone or nearshore clarity to a degree expected to affect fish behavior or foraging. In contrast, increased turbidity and the potential redistribution of sediment from pile driving or vibratory pile removal may have adverse effects to eelgrass habitat from smothering within Bravo bayside training lane.

Considering the infrequency of these activities and the duration between driving piles within a high-energy surf zone, effects to fish within the offshore boat lanes would be temporary and localized. Effects to fish species within Bravo can be more precisely defined based on fish densities known to occur within that ecoregion as well as eelgrass habitat. Using the density of 0.08 fish per square foot published by Allen (1999) and assuming that each pile being driven affects a 30 ft radius around each pile, based on a 24" steel pile and 180 dB re 1 $\mu Pa^2$-s, a total of 2,826 fish could be temporarily displaced or affected during each pile driven. Approximately 100 piles are driven for a 1,200 ft ELCAS pier. Considering the overall length of the ELCAS pier only a small percentage of all piles driven would occur within the narrow band of eelgrass habitat in Bravo (Figure 3.7-3). Fish documented to frequent deep and moderately deep habitat are comprised of fish known to inhabit large areas and make behavior modifications to avoid disturbance, concentrating effects to fish to primarily within eelgrass habitat. Caution should be used in extrapolating the total number of fish potentially affected from an ELCAS event since effects determinations were calculated for the most impulse susceptible fish (small fish < 0.5 lbs with swim bladders).

Small fish with swim bladders are numerically dominant in Allen (1999) density calculations for the South Central San Diego bay because they represent multiple sampling methodologies. The fish likely to be present with the effects area are represented by primarily schooling fish (northern anchovies, slough anchovies, and top smelt) that can easily avoid detrimental impulse and the remaining fish (predominantly gobies and pipefish) do not have swim bladders and are substantially (100 times less according to Goertner 1994) less susceptible to the same impulse levels. In summary, ELCAS activities are performed infrequently (twice per year) and, in most cases, within an already physically challenging surf zone habitat. Effects to fish species would be concentrated within close proximity to pile driving activities and most notably within eelgrass habitat. Considering the extent of adjacent habitat and the quantities of fish known to exist within that habitat, effects to fish populations from ELCAS activities would be temporary and localized. Lethal and sublethal effects to fish species would be localized to the immediate pile driving area and intertidal area containing eelgrass for the bayside training events. Effects to individual fish species would be minimal and no adverse effects would be anticipated for overall fish assemblages or populations.

The initiation of the ELCAS activity (movement of boats and barges, positioning of pile before driving, etc.) likely displaces many of the resident fish reducing the potential for lethal effect. Similar habitat is extensive to the north and south of the training areas, which provides adequate habitat for fish to relocate due to disturbance. Depending on the time of year, several other species may be locally displaced; however, no long-term effect to individual populations is anticipated. Any effects to fish species would be considered below measurable thresholds, outside of eelgrass habitat.

As described in Section 3.7.2.2.3, amphibious and beach activities in the SSTC ROI would not measurably alter the water or sediment quality from debris or discharge sufficient to impact EFH. Adverse modifications to benthic habitat resulting in effects to EFH occur on a limited basis during amphibious landing and beach construction activities within eelgrass habitat. Amphibious landing and beach construction activities within eelgrass habitat are constrained to training lane Bravo and impacts to EFH are offset by replacement of affected eelgrass habitat addressed in Section 3.7.1.5.

### Beach Activities

Beach activities covered in this section involve activities that transfer fuel (simulated) or water from vessels on the water to beaches within training areas (Activities 38, 39, 50, Table 2-1). The focus of the analysis for the applicable activities is concentrated on the type of medium being transferred and the nearshore waters or intertidal areas that may be effected by equipment movement or positioning. Effects from marine vessel movements or landings are address in Section 3.8.2.2.2. Fluid transfer training events involve two activities; (1) the simulation of fueling transfers from ship-to-ship and shore-to-ship utilizing seawater and (2) the intake of seawater for desalination and the discharge of hypersaline brine back into San Diego Bay. Fluid transfer activities consist of transferring salt water to simulate fuel transfer (Activity 38, Offshore Petroleum Discharge System [OPDS]) and Activity 39 Amphibious Bulk Liquid Transfer System [ABLTS], and bringing saltwater ashore for desalinization (Activity 50, Reverse Osmosis Water Purification Unit [ROWPU]).

During an OPDS activity, a fuel transport conduit is towed ashore and anchored in between. During ABLTS training, the conduit floats on the water surface. Water is pumped to a unit on shore to simulate fueling and returned to the ocean with a hose. OPDS and ABLTS training occurs six and four times annually under the No Action Alternative, respectively. During the construction and installation of conduit needed for OPDS activity conduit is placed along the intertidal substrate where it has the potential to adversely affect eelgrass and other intertidal habitat by crushing or scouring during placement. Within the oceanside training lanes of SSTC-N and SSTC-S activities are performed infrequently, in most cases, within an already physically challenging surf zone habitat. The OPDS conduit is 8 inches in diameter and is anchored to the bottom with the remaining portion of the conduit resting in the intertidal habitat. Scouring from vessels performing conduit installation is addressed in Section 3.8.2.2.2 Marine Vessel Activities and would be limited to eelgrass habitat with Bravo. Effects to fish species would be concentrated within close proximity to conduit activities and most notably within eelgrass habitat and be limited to temporary displacement. Considering the extent of adjacent habitat and the quantities of fish known to exist within that habitat, effects to fish assemblages from OPDS activities would be temporary and localized. Sublethal effects to fish species would be limited to burrowing species in the immediate conduit area containing eelgrass for the bayside training events and recolonization would likely occur rapidly from adjacent fish populations. Effects to individual fish species would be minimal and no adverse effects would be anticipated for overall fish assemblages or populations.

Simulated fueling transfer poses minimal risk to fish species due to its localized nature and infrequent use. The intake of sea water from the ocean has a potential to remove larval fish and YOY that are in the close proximity ocean water intake. Depending on the time of year, depth, and velocity of the intake pipe, certain species are more susceptible than others. Impingement on the end of the pipe could affect larger fish but considering the activity only occurs 10 times per year minimal effect to fish populations are anticipated.

During ROWPU training, salt water is brought ashore and desalinized. Hypersaline water is then stored in a bladder and transported offsite for sewerage or mixed with potable water and discharged back into the sea at nearly the same salinity as the source ocean water and quantities are not likely to affect fish, considering the dissolution factor and physical mixing that occurs within the surf zone and nearshore waters where activities occur. Any physical effects to fish would be temporary and localized as training activities occur infrequently (4 times per year). For the limited instances that these transfer activities take place within Bravo the greatest potential for effect to fish species is from the interface of the conduit and/or equipment lying within intertidal habitat possesses the greatest potential for effect to fish species. Fish identified to inhabit intertidal mudflats and eelgrass habitat vary widely but several species (gobies, pipefish) either build burrows or maintain defined home ranges within specific areas. Effects from fluid transfer activities including sound, shock waves, habitat modification, and effects to turbidity would have lethal and sublethal effects to fish species in those areas. Water intake during activities in Bravo likely to occur in deep or moderately deep water could entrain adult and juvenile fish as well as eggs and larvae to some extent, but since the intake water is returned to San Diego Bay lethal effects would be limited if any. In summary, no long-term adverse effects would occur from fluid transfer activities and any effect to individual fish species would be localized and temporary. Amphibious and Beach activities in the SSTC ROI do not physically disrupt behavior or migration patterns of fish species.

### 3.8.2.3 Alternative 1 (Preferred Alternative)

Alternative 1 increases the current level and types of training that occur in the ROI. Current management and mitigation measures would remain unchanged (Section 3.8.1.7 and 3.8.1.8). This section focuses on only groups of activities that have the potential to result in an impact to specified fish species. As discussed previously, similar types of activities are grouped together to facilitate effects analysis.

#### 3.8.2.3.1 Air Activities

The types of air activities proposed for Alternative 1 are consistent with those described under the No Action Alternative, although the frequency would increase and five new activities would be conducted (Activities N4–N8, Table 2-2). As presented in Chapter 2 (Table 2-1 and 2-2), helicopter activities over San Diego Bay and ocean waters within the ROI would more than double under Alternative 1 in comparison to the No Action Alternative. As described in Section 3.8.2.2.1, air activities are expected to have a minimal effect on fish, and the change in the numbers of activities would not change those predictions.

The use of helicopters within the ROI will be consistent with previously described activities and effects attributed to this activity would be of the same type and magnitude. Disturbance of fish from the noise, physical presence, or sea surface disturbance from aircraft within the ROI would be limited to fish utilizing the area immediately adjacent to the action and likely only within the uppermost section of the water column. Reduced foraging success or behavior modification attributed to air actions is not likely to occur according to findings previously presented. Any temporary effect to fish near the surface remains a low probability considering the temporal variability of both training actions and the potential for fish to be present near the sea surface within a specific training area.

Increases to air activities under Alternative 1 would not measurably change the effect to fish species from the No Action Alternative. Considering effects to fish species from air activities are isolated to noise and movement disturbance, the increase would not measurably change the potential effect to fish species or their populations.

### 3.8.2.3.2 Marine Vessel Activities

Marine vessels, self propelled, propeller and water-jet driven, or towed, would increase in use and scope under Alternative 1 compared to the No Action Alternative. The greatest increases to marine vessel activities would be attributed to new activities; Surf Zone Test Detachment, and Shock Wave Action Generator (SWAG) as well as increases to existing activities. Increases to on-water activity by marine vessels in both oceanside and the San Diego Bay training areas would increase the possibility of effect to fish species from noise and disturbance, most notably from large marine vessels, but would not measurably reduce fish species' capacity to persist unaffected. As the types of small marine vessels are expected to remain the same, even large increases of the use of small marine vessels will have little to no effect on fish species present. As such, activities involving small marine vessels used in support of diving, swimming or training which do not come in contact with marine substrates (Activities 2, 3, 5, 6, 7, 8, 9, 10, 11, 12, 14, 18, 21, 23, 26, 28, 34, 35, 57, 77, 78, N4, N6, N7, Table 2-1 and 2-2) are anticipated to have little to no effect on fish species present based on effects criteria discussed in Section 3.8.2.1 regarding noise effects, behavioral modifications, or physical injuries. Vessels remain on the surface and only occasionally land on beaches and mudflats where burrowing fish may be affected from crushing. Continued use of delineated training areas and avoidance of eelgrass beds and mudflats would reduce potential harmful effects to sensitive habitat.

New activities under Alternative 1 that will take place within all boat training lanes and bayside training areas (Activities N1, N2, N4, N6-N9, N11, Table 2-2) involve the use of both large and small mechanically driven vessels that are used to support training activities within boat lanes and San Diego Bay training locations. Potential effects from these activities on EFH are detailed in Section 3.7.2.3. Sound levels from transiting vessels and would not have physical effects on fish based on documented sound levels and effects criteria. The use of both large and small mechanically driven vehicles in the ROI will be consistent with previously described activities and effects attributed to this activity would be of the same type and magnitude.

### 3.8.2.3.3 Underwater Detonations

Underwater detonations occur in shallow water (less than 72 feet) within oceanside training lanes and the shock waves propagate over a mostly homogeneous sand substrate. As presented below (Table 3.8-11), underwater detonations would increase measurably from 103 activities under the No Action Alternative to 311 activities under Alternative 1. Under Alternative 1, five additional activities would be conducted: SWAG and UUV Neutralization, Airborne Mine Neutralization System, Demolition Requalification and Training/Underwater Detonations, and NSW Underwater Demolition Training (N1, N3, N7, N9, and N11, respectively, Table 2-2) and the footprint of activities would be expanded to include SWAG detonations of up to 15 grams NEW within San Diego Bay. Potential effects from these activities on EFH are detailed in Section 3.7.2.3.

As described in Section 3.8.2.2.3 the impulse generated from underwater detonations and the size and species of fish present with the effect area directly correlates to the area of effect. The threshold for 1% mortality from an underwater detonation is estimated to be at the point where impulse waves measure below 69 Pa·s (10 psi-ms) for gobies and 116 Pa·s (16.8 psi-ms) for Pacific sardines, the most impulse

**Table 3.8.11: Underwater Explosive Activities Conducted during Alternatives 1 and 2**

| Activity Number | Underwater Detonation Operation | NEW[1] (pounds) | Number of Detonations | Water Depth (feet) | Charge Depth | Tempo | Location |
|---|---|---|---|---|---|---|---|
| 5 | MCM[2] | 10 to 20 | 1/operation (op) | ≤ 72 | Mid-water | 29 ops/yr | Boat Lanes 1 - 14 |
| 5 | MCM | 10 to 20 | 1/op | ≤ 72 | Bottom | 29 ops/yr | Boat Lanes 1 - 14 |
| 6 | Floating Mine | ≤ 5 | 1/op | ≤ 72 | Surface (< 5 feet) | 53 ops/yr | Boat Lanes 1 - 14 |
| 7 | Dive Platoon* | 3.5 | 8/op | 30 – 72 | Bottom | 8 ops/yr | Boat Lanes 1 - 14 |
| 9 | VSW MCM | 0.1 to 20 | 1/op | ≤ 24 | Bottom | 60 ops/yr | Boat Lanes 1 - 14 |
| 10 | UUV[3] Ops | 10 to 15 | 1/op | 10 ≤ 72 | Bottom to 10 feet from surface | 4 ops/yr | Boat Lanes 1 - 14 |
| 11 | MMS[4] Ops | 13 & 29 | 2/op | 10 ≤ 72 | Bottom | 8 ops/yr | Boat Lanes 1 - 14 |
| 11 | MMS Ops | 13 & 29 | 1/op | 24 ≤ 72 | Bottom to 20 feet from surface | 8 ops/yr | Boat Lanes 1 - 14 |
| 12 | Mine Neutral* | 3.5 | 8/op | 30 – 72 | Bottom | 4 ops/yr | Boat Lanes 1 - 14 |
| N1 | SWAG | 0.033 | 1/op | 10 – 20 | Mid-water | 74 ops/yr | Echo |
| N1 | SWAG | 0.033 | 1/op | 10 – 20 | Mid-water | 16 ops/yr | Boat Lanes 1 - 14 |
| N2 | Surf Zone T&E | Up to 20 | 1/op | ≤ 24 | Bottom | 2 ops/yr | Boat Lanes 1 - 14 |
| N3 | UUV Neutral | 3.3 & 3.57 | 2/op | 10 – 72 | Bottom to 10 feet from surface | 4 ops/yr | Boat Lanes 1 - 14 |
| N7 | AMNS | 3.53 | 1/op | 40 – 72 | Mid-water to Bottom | 10 ops/yr | Boat Lanes 1 - 14 |
| N9 | Qual/Cert[5] | 12.5 – 13.75 | 2/op | 10 – 72 | Bottom | 8 ops/yr | Boat Lanes 1 - 14 |
| N9 | Qual/Cert | 25.5 | 1/op | 40 – 72 | Bottom to 20 feet from surface | 4 ops/yr | Boat Lanes 1 - 14 |
| N11 | NSW Demolition Training | ≤ 10 | 1/op | ≤ 24 | Bottom | 4 ops/yr | Boat Lanes 1 - 14 |
| N11 | NSW Demolition Training | ≤ 3.6 | 1/op | ≤ 24 | Surface | 8 ops/yr | Boat Lanes 1 - 14 |
| 37 | SDV/ASDS | ≤ 10 | 1/op | ≤ 24 | Bottom to Mid-water | 40 ops/yr | Boat Lanes 1 - 14 |

[1]NEW: Net Explosive Weight. [2] MCM: Mine Counter Measures, [3] UUV: Unmanned Underwater Vehicle, [4] MMS: Marine Mammal Systems, [5] Qual/Cert: Qualification or Certification trials,
* Most training events are a single detonation (i.e., 1/op) per event. However, several training activities involve sequential charges during the same training event. Unless otherwise specified, all sequential charges are conducted either less than 10-seconds apart or greater than 30-minute apart.

sensitive fish species within the ROI. Other species have impulse thresholds greater than 145 Pa-s (21.0 psi-ms).

Utilizing the modeled distance to a received pressure of 13.0 psi·ms as a conservative estimate instead of the 16.82 psi·ms value, NUWC modeled ZOIs can be used. The ZOIs for the 13.0 psi-ms impulse threshold for Alternative 1 are shown in Table 3.9-7. For a 29 lb charge used during marine mammals systems training, the ZOI to the 13.0 psi-ms threshold is 360 yards (Section 3.9 for a detailed explanation of acoustic modeling) The variable impact to fish is species and size dependent (swim bladder versus no swim bladder), and it is conservative to assume that small fish (i.e. Pacific sardines < 0.5 pounds) within 360 yards (1080 feet) of the largest underwater detonation would suffer 1 percent mortality, according to effects criteria defined in Table 3.8-9 and in Section 3.8.2.1.1 as defined by Goertner (1994). Considering the common fish species documented to inhabit surf zone of Southern California, primarily large transient predators(sharks, rays, halibut, etc), roving substratum feeders (perch, corbina, croakers, etc) or schooling baitfish (top smelt, anchovy, etc). (Allen et al. 2006) it can be assumed that significant portion of the fish in the area surrounding an underwater detonation are either large in size (> 3 lbs) or do not have swim bladders. These factors greatly reduce the probability that specific fish species or assemblages would be adversely affected outside of the immediate area of the blast (30 ft), based on Goertner (1994) effects criteria. Overall impacts to specific fish species and assemblages would remain temporary and localized considering the expansive nature of the adjacent habitat, the population size and dispersed nature of potentially effected fish populations, and the frequency of the largest underwater detonation activities (less than sixteen 29 lb detonations per year).

Effects to fish from underwater detonations within waters of the ROI are based on modeling and tests performed by various institutions. The radius of lethal and sublethal effect to fish is solely based on interpolation of those modeling and test results and the maximum size of the detonation known to take place for each activity. Considering that nearly all SSTC underwater detonations occur in nearshore boat lanes 1-14 over mostly sand bottom, documented to harbor low fish densities compared to nearby rocky/kelp forest habitat, effects to fish assemblages would be localized and temporary. In summary, fish known to reside and transit the nearshore ocean portion of the ROI utilized for underwater detonations (waters contained within boat lanes less than 72 ft MLLW) are variable in both time and space.

Fish most susceptible to impulse injuries from SSTC underwater detonations (pacific sardines, northern anchovies, and top smelt) are extremely abundant (Allen 1999 estimated that 42 million northern anchovy reside in San Diego Bay) vary seasonally and inhabit a large geographic area that extends from Canada to Mexico. Resident and diurnal transients such as California halibut, croakers, bass, and various elasmobranches (sharks and rays) are not documented to be present in high densities within the ocean portions of the ROI and due to their size would be less susceptible to injury. For example, a 9 pound kelp bass would have an LD 1 of approximately one third the distance from the center of the same detonation as a Pacific sardine, resulting in an effect area of only one tenth that of smaller fish. Overall impacts to specific fish species and assemblages would remain temporary and localized considering the expansive nature of the adjacent habitat, the population size and dispersed nature of potentially effected fish populations, and the frequency of the largest underwater detonation activities. The increased detonations on the oceanside of SSTC-N under Alternative 1 are more likely to affect free-floating and infaunal invertebrates, as described in Section 3.7.2.3.3; however, due to low densities and short recovery times, this difference is also negligible and the effects to EFH would be similar to that described under the No Action Alternative.

### 3.8.2.3.4 Amphibious and Beach Activities

#### Amphibious Activities

Amphibious vehicles, specifically AAVs and Expeditionary Fighting Vehicles (EFVs), would be involved in activities that perform landings in beach side training lanes in SSTC-N and SSTC-S and increase in activity frequency from 3 to 18 times per year. Amphibious vehicle landings interface with the bottom substrate at various levels depending on the tide but would not be expected to adversely impact fish habitat or fish. The surf zone habitat of the beach side training lanes is exposed to the predominant wind and wave direction and sediment in continually redistributed on both a daily and seasonal bases. Considering the limit draft (< 5 feet) of the AAV and EFV and small size (< 30 feet length) of the vehicles in conjunction with the steep slope of the beach throughout the SSTC-N and SSTC-S, bottom disturbance would be limited and not expected to adversely impact fish habitat. Fish utilizing the landing areas would not be expected to suffer from adverse effects attributed to disturbance and would more likely take advantage of the sediment displaced or suspended by the vehicles for opportunistic feeding of liberated invertebrates.

ELCAS training activities would increase from three to four activities under Alternative 1 compared to the No Action Alternative and would remain within the same training area as the No Action Alternative. As described in Section 3.8.2.2.4, ELCAS activities are expected to have lethal and sublethal effects to fish species within areas sustaining greater than 180 dB re 1μPa depending on the type of fish within the effects radius at the time of the activity. Increases in the frequency of the shock waves attributed to pile driving will subsequently increase the frequency of the lethal and sublethal effects to fish species within the defined effects radius. However, the overall effects to individual fish species, assemblages, and EFH are expected to be temporary and localized considering the expansive nature of the adjacent habitat, population of the potentially effected species, and the frequency of piling driving activities. Effects to individual fish species would range from lethal to no effect; however, no adverse effects would be anticipated for overall fish assemblages or populations.

#### Beach Activities

Increases in beach activities not discharging byproducts or interfacing with the nearshore or San Diego Bay waters have no potential to affect fish species or assemblages and thus are not analyzed in this section as stated previously in Section 3.8.2, Environmental Consequences. The total number of activities with the potential to affect fish species increases from four to five from the No Action Alternative to Alternative 1, and is limited to Amphibious Bulk Liquid Transfer System (ABLTS) activities.

ABLTS is expected to have a minimal effect on fish, and incremental change in the numbers of activities would not change those predictions. Surface coverage by conduit is not sufficient to affect behavior of fish species, and bottom substrate disturbance or modification within the surf zone or intertidal areas attributed to equipment or sand movement occurs within an already physically disturbed zone in the case of beach areas and could only be quantified within San Diego Bay by the loss of eelgrass habitat. Any effect to fish within the boat lanes would be below measurable thresholds and would be only anticipated to occur within San Diego Bay if eelgrass habitat was modified or destroyed (Section 3.7.3.3).

The expected increased risk of habitat modification and invasive species introduction with increased waste associated with new activities or increases in activities in Alternative 1 would not constitute a measurable difference between Alternative 1 and the No Action Alternative; there is no documented correlation between any activity and trash or solid waste.

#### 3.8.2.4 Alternative 2

Implementation of Alternative 2 would increase the total operational training tempo to the same levels as presented for Alternative 1 (Table 2-1 and 2-2). Implementation of Alternative 2 would also include the introduction of new types of training; conducting existing routine training at additional locations within SSTC established training areas, like Alternative 1. The only difference between Alternative 1 and 2 is that all SSTC-N oceanside beach training areas would be available for use, regardless of time of year. Since the differences between Alternative 1 and Alternative 2 are not marine related, the impacts associated with Alternative 2 are expected to be the same as those described above for Alternative 1.

### 3.8.3 Proposed Mitigation Measures

Since most of the local marine environment consists of soft-bottom habitat with few rocky habitats and the local fish populations are not robust, most Navy activities will not affect fish populations within the ROI. The largest expected impact to fish species and assemblages comes from underwater detonations and the modification or destruction of eelgrass habitat within Bravo training area. The mitigation for 1.13 acres of lost eelgrass habitat discussed in Section 3.7 would provide additional habitat for fish species potentially lost or displaced from eelgrass by activities described in this section, thus partially mitigating effects to fish. Additionally, restriction of the public from accessing some sections of the training areas during some training for public safety and security reasons affords fish resources within those areas a certain level of refuge from recreational fishing pressure and disturbance. Furthermore the set aside of undeveloped shoreline for training offsets effects from training activities and assures that high value eelgrass and salt marsh habitat remains available to fish for foraging and reproduction.

As a result of the EFH consultation with the NMFS, the Navy will conduct a new bottom habitat mapping survey to more accurately detail potential habitat types (ex., sand, cobble, rocks) within the oceanside SSTC boat lanes. This effort, scheduled to begin in 2011, is designed to update bottom type classification at finer resolution and spatial scales than previous California State funded surveys from 2002. The goal from this Navy funded survey would be to provide information to NMFS on habitat types within SSTC, and to Navy commands conducting underwater detonations at SSTC for consideration in selection of appropriate bottom-laid detonation sites. Similar to the measures used to avoid sensitive habitats when selecting underwater explosive device detonation sites, the nearshore habitat survey data will also be used to ensure the OPDS system is not placed within any sensitive habitats.

The Navy will conduct April to May pre-event surveys for grunion prior to SSTC training events that could to disturb intertidal beach areas. From Table 2-1, events identified for grunion pre-event surveys include 41- Causeway Pier Insertion and Retraction training (max. of 10 per year), and 42-ELCAS (max. of four per year). These training events generally occur within only a few boat/beach lanes in SSTC-N and can occur throughout the year. For events that have a requirement to occur in April and May, the Navy will use predicted grunion spawning periods obtained from the California Department of Fish and Game (http://www.dfg.ca.gov/marine/grunionschedule.asp ) to anticipate times to survey 10-14 days prior to the next ELCAS or Causeway Pier Insertion and Retraction.

This survey will identify if grunion spawning occurred or did not occur on the beach area scheduled for training. If grunion spawning is documented, then a determination on the spatial extent of spawn across the planned training area and magnitude of spawning (on the standard grunion 0-5 spawning scale) will be made. If a significant spawning run is observed (4 or 5 on the spawning scale) coincidental with and at the same location as the beach-impacting training event, the Navy will attempt to delay the event or move to a training area of lower density spawning or an area of no spawning. If such a shift cannot be done due to schedule conflict over multiple SSTC boat and beach lanes, logistic requirements to use a specific lane or area within a lane that precludes a shift, or safety considerations (ex., weather conditions, sea state), then the Navy will inform NMFS Southwest Region that training was conducted on that site for the specified reason.

Under the NMFS Incidental Harassment Authorization (IHA) consultation, there will likely be annual SSTC-specific reporting requirements on the quantities (number of detonations) and types (charge weight) of individual explosive used. The Navy is already building a data collection process for this information in anticipation of the NMFS requirement. While spatial display and quantification of some Navy training including detonation locations is classified, as a minimum, annual underwater detonation quantities used will be released to NMFS Office of Protected Resources in a classified report, similar to current reports the Navy provides for other range complexes. In addition, also as part of the IHA monitoring requirement, the Navy will be conducting representative mitigation monitoring for a sub-set of the total underwater detonations authorized by NMFS. This is approximately 4-16 individual detonation training events. During this monitoring, civilian marine biologists will independently observe the oceanside detonation site for marine mammals and sea turtles to ensure and document that the correct protective measures are applied. Under the EFH consultation, these biologists will also document the extent and quantity of any fish morality (or lack of mortality). This information will be included in the Navy's annual monitoring report to NMFS.

### 3.8.4 Unavoidable Adverse Environmental Effects

There are no unavoidable adverse effects to fish as a result of implementation of any alternatives.

### 3.8.5 Summary of Effects

Fish species and assemblages within estuaries and the nearshore ocean environments of the ROI are well adapted to physical changes in the environment and modify their activities based on stimuli within their immediate area. Most fish species potentially affected by activities of both the No Action Alternative and Alternatives 1 and 2 would likely actively move away from potentially harmful training activities, but some individual fish species will suffer lethal and sublethal effects do to their proximity to underwater detonations or pile driving activities Table 3.8-12 presents a summary of effects and mitigation measures for the No Action Alternative, Alternative 1, and Alternative 2.

The EFHA concludes that based on the extent, duration, and magnitude of potential impacts from SSTC training and testing, that there could be an adverse impact of up to 1.13 acres (0.46 hectares) of eelgrass habitat in San Diego Bay. The Navy currently maintains a signed agreement with the Army Corps of Engineers and NOAA Fisheries (i.e., Banking Instrument; N00242-080624-X42-MOA; DoN 2008) to mitigate or compensate impacts to eelgrass habitat, and any impacts to eelgrass within the designated training lane within Bravo training area will be offset by the NEMS.

Adverse effects to EFH and to fish in general from underwater detonations and certain select beach activities would be temporary, localized, and minimal, there would be no lasting effects to populations, prey availability, or the food web. Any potential effects would be further reduced with the proposed protective measures including bottom mapping of sensitive habitat. Therefore no adverse effect to EFH for the four major FMPs and their associated managed species are anticipated.

A full description of the EFHA consultation process is provided in Chapter 6 and Appendix G provides a list of the Silver Strand Training Complex (SSTC) EFHA consultation documentation. Agency correspondence and supporting documentation can be found on the SSTC EIS website at www.silverstrandtrainingcomplexeis.com.

**Table 3.8-12: Summary of Effects**

| Alternative | Effects |
|---|---|
| **No Action Alternative** | • Small numbers of fish would be killed by shock waves from underwater detonations associated with the SSTC. However, underwater detonations would occur primarily in low-use habitats.<br>• Noise associated with marine vessels is unlikely to affect fish as source levels from these sources are below those known to cause injury. Noise associated with pile driving would have some lethal and sublethal effects to fish but impacts would be localized due to the nature of the activity.<br>• Groundfish are unlikely to be affected by activities in shallow waters.<br>• With the current protective measures, no adverse effect to EFH and their associated managed species are anticipated. |
| **Alternative 1** | • Increases in pile driving and underwater detonation activities would increase the lethal and sublethal effect to fish species but fish assemblages would not be expected to be affected.<br>• With the proposed protective measures, no adverse effect to EFH and their associated managed species are anticipated. |
| **Alternative 2** | • Increases in pile driving and underwater detonation activities would increase the lethal and sublethal effect to fish species but fish assemblages would not be expected to be affected.<br>• With the proposed protective measures, no adverse effect to EFH and their associated managed species are anticipated. |
| **Mitigation** | • Habitat mitigation for intertidal and subtidal areas (Section 3.7), including eelgrass, provide a degree of mitigation for fish species documented to reside within those habitats.<br>• The mitigation for 1.13 acres of lost eelgrass habitat discussed in Section 3.7 would provide alternative habitat for fish species potentially lost or displaced from eelgrass by activities described in this section, thus mitigating effects to fish.<br>• As a result of the EFH consultation with the NMFS, the Navy will conduct a new bottom habitat mapping survey to more accurately detail potential habitat types (ex., sand, cobble, rocks) within the oceanside SSTC boat lanes. Similar to the measures used to avoid sensitive habitats when selecting underwater explosive device detonation sites, the nearshore habitat survey data will also be used to ensure the OPDS system is not placed within any sensitive habitats.<br>• The Navy will conduct April to May pre-event surveys for grunion prior to SSTC training events that could to disturb intertidal beach areas. For events that have a requirement to occur in April and May, the Navy will use predicted grunion spawning periods obtained from the California Department of Fish and Game (http://www.dfg.ca.gov/marine/grunionschedule.asp ) to anticipate times to survey 10-14 days prior to the next ELCAS or Causeway Pier Insertion and Retraction. This survey will identify if grunion spawning occurred or did not occur on the beach area scheduled for training. For cases in which a significant spawning run is observed coincidental with and at the same location as a planning training event, the Navy will attempt to delay the event or move to a training area of lower density spawning or an area of no spawning. If such a shift cannot be done due to schedule conflict over multiple SSTC boat and beach lanes, logistic requirements to use a specific lane or area within a lane that precludes a shift, or safety considerations (ex., weather conditions, sea state), then the Navy will inform NMFS Southwest Region that training was conducted on that site for the specified reason. |

**Table 3.8-12: Summary of Effects (Continued)**

| Alternative | Effects |
|---|---|
| **Mitigation** | • Under the NMFS Incidental Harassment Authorization (IHA) consultation, there will likely be annual SSTC-specific reporting requirements on the quantities (number of detonations) and types (charge weight) of individual explosive used. In addition, also as part of the IHA monitoring requirement, the Navy will be conducting representative mitigation monitoring for a sub-set of the total underwater detonations authorized by NMFS. This is approximately 4-16 individual detonation training events. During this monitoring, civilian marine biologists will independently observe the oceanside detonation site for marine mammals and sea turtles to ensure and document that the correct protective measures are applied. Under the EFH consultation, these biologists will also document the extent and quantity of any fish morality (or lack of mortality). This information will be included in the Navy's annual monitoring report to NMFS. |

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# 3.9 Marine Mammals

# 3.9 MARINE MAMMALS

## 3.9.1 Affected Environment

### 3.9.1.1 Definition

This section describes the marine mammal species expected to be present in the Silver Strand Training Complex (SSTC) area that potentially could be affected by the Proposed Action. The potential effects are analyzed, and a discussion is presented concerning current management and mitigation practices.

### 3.9.1.2 Regional Setting

Outside of the coastal zone of SSTC is part of the Pacific Ocean region referred to as the southern California Bight (SCB). The colder, more northerly California Current and the southern, warm-water California countercurrent (known as the Davidson Current, Figure 3.5-1) influences the ocean within the SCB. These two currents mix in the Santa Barbara Channel. The water within the southern portion of the SCB is warmer and more saline than the water within the northern area (Hickey 1993). These differing conditions, as well as upwelling of cooler, nutrient-rich waters, influence the diverse marine biota within and adjacent to the SCB region (Murray and Littler 1981). San Diego Bay is a naturally-formed, crescent-shaped embayment that is located along the southern end of the SCB (Largier 1995, DoN 2000); the San Diego Bay provides habitat for a number of oceanic and estuarine species as the ebb and flood of tides within the San Diego Bay circulate and mix ocean and bay waters, creating for distinct circulation zones within San Diego Bay (Largier et al. 1996, DoN 2000) (Section 3.5 Water Resources).

### 3.9.1.3 Region of Influence

The marine Region of Influence (ROI) can be partitioned into three zones:

- Bayside training zones within the San Diego Bay (sandy beaches, mudflats, and the nearshore environment);
- Ocean area training zones from intertidal to nearshore (<0.5 nautical mile [nm]) south of Naval Air Station North Island (NASNI); and
- Ocean area training zones from intertidal to nearshore (<3 nm) encompassing the training lanes at SSTC-North (SSTC-N), SSTC-South (SSTC-S), and ocean anchorages.

Marine mammals reasonably expected to use the ocean area <3 nm of SSTC for any portion of their life cycle are discussed in this section. Based on both anecdotal observations and several recent Navy funded surveys, there are limited to no marine mammal species present within the back portions of San Diego Bay south of the Coronado Bay Bridge (Merkel Inc. 2008).

### 3.9.1.4 Marine Mammals that May Inhabit or Regularly Transit the SSTC

Marine mammals addressed in this EIS include members of two orders:

1. Order Cetacea, which includes whales, dolphins, and porpoises
2. Order Carnivora, which includes true seals, sea lions, and fur seals

Cetaceans spend their lives entirely at sea. Carnivora, or pinnipeds, hunt and feed exclusively in the ocean, with certain species in southern California coming ashore to rest, molt, breed, and bear young.

Extensive natural history information for marine mammal species occurring within southern California waters has been summarized in previous works (Leatherwood et al. 1982, 1988; Reeves et al. 2002; DoN 2005c; Carretta et al. 2007; Department of the Navy [DoN] 2008). Approximately 41 marine mammal species or stocks are known to occur within southern California waters based on National Marine Fisheries Service (NMFS) Stock Assessment Reports (Carretta et al. 2007, DoN 2008). Of these, only three year-round species and one migratory species are expected to be found within the SSTC marine ROI. These include the California sea lion (*Zalophus californianus*), Pacific harbor seal (*Phoca vitulina richardii*), bottlenose dolphin (*Tursiops truncatus*), and gray whale (*Eschrichtius robustus*). Densities from Southern California (SOCAL) Range Complex Environmental Impact Statement/Overseas Environmental Impact Statement with the exception of bottlenose dolphin which was from NCCOS (2005). While the density estimated for gray whales more than likely over-estimates potential density off SSTC, NMFS Southwest Fisheries Science Center recommends using this density because it the best currently available information. Table 3.9-1 summarizes the population status and abundance of each of these species.

The United States stock of California sea lion and the California stock of Pacific harbor seal can be commonly found at haul-out sites on the mainland, on buoys and docks within California harbors including northern San Diego Bay, and the Channel Islands. Breeding sites for California sea lions are exclusively on the islands off the coast of California for California sea lions. Harbor seals have island and some mainland breeding sites. For both California sea lions and harbor seals, there are no haul-out sites, or rookeries within or adjacent to the SSTC. The California Coastal stock of the Pacific bottlenose dolphin is a toothed whale (odontocete) that regularly inhabits the nearshore waters of southern California. This species regularly moves along the California coast and may transit the SSTC area since they remain close to shore (within 0.5 nm). This particular stock has limited site fidelity and can be distributed anywhere between Monterey to northern Baja Mexico depending on localized prey abundance. The Eastern Pacific stock of gray whale occurs off southern California during their annual migration between summer feeding areas in the Bering and southern Chukchi seas and winter calving areas in Baja California and mainland Mexico. While gray whales may occasionally be found within 1 nm (1.8 kilometer [km]) of shore during their migration periods, they are found further offshore than the nearshore waters at SSTC (NMFS, J. Barlow 2007). As such, gray whales would be infrequent transients through or seaward of the outer section of the SSTC.

None of the four marine mammal species that inhabit or regularly transit the SSTC are listed as threatened or endangered under the Endangered Species Act (ESA). All marine mammals are protected under the Marine Mammal Protection Act (MMPA) of 1972, amended in 1994. The MMPA is administered by NMFS. The MMPA prohibits any person subject to the Act from taking a marine mammal within U.S. waters or on the high seas, without authorization from NMFS.

For three species (bottlenose dolphins, California sea lion, and harbor seals), the marine waters within the SSTC only constitute a small portion of their total range. California sea lions and harbor seal abundance—as reflected by number of pinnipeds seen hauled out on northern San Diego Bay docks and buoys (Merkel Inc. 2008)—may be seasonally higher at certain times of the year due to local movement between offshore rookeries and the mainland. The gray whale only transits the nearshore waters west of SSTC during annual migrations between northern feeding grounds and breeding lagoons in Mexico. There are no pinniped haul-out sites within the SSTC; therefore, dependent pups would not be expected in the ROI. The nearest documented harbor seal beach haul-out site is located at the Children's Pool in La Jolla, California—14 miles northwest of the SSTC area (Lowry and Carretta 2003). California sea lions enter San Diego Bay to forage on scraps near commercial bait barges and haul-out on jetties or buoys. Harbor seals can occasionally be seen hauled out on buoys within San Diego Bay. but no regular haul-out sites are located near the ROI. Sick or injured marine mammals can strand on California beaches, with pinnipeds being the most common marine mammal to strand on California beaches (NMFS 2000). Strandings of marine mammals usually consist of a single animal but occasionally groups of several of odontocetes, or toothed whales, will strand. The causes of strandings include starvation (particularly in young animals), seizures due to natural (e.g., domoic acid) or anthropogenic toxins, diseases (e.g., morbillivirus, leptospirosis) and predation. Within California, domoic acid toxicity is a significant source of mortality and strandings for pinnipeds and dolphins (Lefebvre et al. 1999, Scholin et al. 1999, Zagzebski et al. 2002, Goldstein et al. 2008, Bejarano et al. 2008, Goldstein et al. 2009).

**Table 3.9-1: Summary of Cetacean and Pinniped Species That May Inhabit, Regularly Transit, Or Seasonally Migrate Past the SSTC**

| Common Name<br>Species Name<br>Stock | Stock Abundance [1] (Coefficient of Variation) | Annual Population Trend | Occurrence | Warm Season (May-Oct) Presence and Density[2] (individuals/km$^2$) | Cold Season (Nov-Apr) Presence and Density (individuals/km$^2$) |
|---|---|---|---|---|---|
| Mysticetes<br>Gray whale<br>*Eschrichtius robustus*<br>Eastern North | 19,126<br>(0.07)<br>Migratory | Increasing >3.2% | Transient, seasonal migrations | NO<br>0 | YES<br>0.014 |
| Odontocetes<br>Bottlenose dolphin<br>*Tursiops truncates*<br>California coastal stock | 323<br>(0.13) | Stable | Limited, small population within one km of shore | YES<br>0.202 | YES<br>0.202 |
| Pinnipeds<br>Harbor seal<br>*Phoca vitulina richardii*<br>California stock | All California 34,233 SOCAL [4] estimated abundance 5,271 | Slight growth; Stabilizing | Common; Channel Islands haul-outs including SCI; mainland California haul-outs north of Pt Mugu | YES<br>0.06 | YES<br>0.19 |
| California sea lion<br>*Zalophus californianus*<br>U.S. stock | 238,000 [3] | Increasing 6.1%; possibly stabilizing | Most common pinniped, Channel Islands breeding sites in the summer | YES<br>0.01 | YES<br>0.02 |

[1] All abundance estimates from NMFS Stock Assessment Reports (Carretta et al 2010, Allen and Angliss 2010) and reflect estimation of abundance for the entire stock.
[2] Densities used for pinnipeds were obtained from Carretta et al. (2000) using the offshore warm and cold season pinniped densities. This publication represents one of the few NMFS at-sea pinniped surveys within Southern California. It is anticipated that while reflective of the more populous offshore numbers of pinnipeds, these values will likely be over predictive of actual at-sea pinniped density within the much smaller spatial extent of the coastal SSTC area (shore to 4000 yards from shore). Densities for the coastal stock of bottlenose dolphins was obtained from the NCCOS 2005 which presents NMFS data for various coastal segments along the California coast, including one adjacent to the SSTC. Densities for gray whales was modified from Carretta et al. (2000) by scientists at the NMFS' Southwest Fisheries Science Center to reflect the limited nature of transitory gray whale presence within the very nearshore habitat of the SSTC. Gray whales migrate through Southern California twice a year. Individual marine mammals likely only present on the order of minutes to hours in transit past SSTC (3 nm/hr travel rate).
[3] All pupping occurs in Southern California.
[4] Derived by NMFS from the aerial counts of all age classes within Southern California only.

Five species are considered rare or infrequent visitors within the SSTC ROI (DoN 2005c, Barlow and Forney 2007, Carretta et al. 2007). Guadalupe fur seals (*Arctocephalus townsendi*) breed on Guadalupe Island in Baja California, Mexico and migrate north to forage. Northern elephant seals (*Mirounga angustirostris*) breed on islands in Baja California, Mexico and the SCB including San Clemente Island off the coast of San Diego (Lowry 2002) and migrate north to forage (Le Boeuf et al. 1993). Northern fur seals (*Callorhinus ursinus*) breed on San Miguel Island which is the southern extent of their range

(Carretta et al. 2007). Pacific white-sided dolphins (*Lagenorynchus obliquidens*) and common dolphins (*Delphinus* spp.) have occasionally been seen during marine mammal surveys west of Point Loma (Merkel Inc. 2008). Though these animals have been noted in the waters outside of the coastal zone and outside of the SSTC ROI, their occurrence is considered rare and these species are not addressed further in this Environmental Impact Statement (EIS).

More detailed information on the four marine mammal species expected to occur within the ROI (gray whale, bottlenose dolphin, harbor seal, and California sea lion) is provided in Sections 3.9.1.5 and 3.9.1.6.

### 3.9.1.5 Cetaceans

#### 3.9.1.5.1 Mysticetes (Baleen whales)

#### Gray Whale

*Stock* – Eastern North Pacific

*Population Status* – In 1994, due to steady increases in population abundance, the Eastern North Pacific stock of gray whales was removed from the Federal List of Endangered and Threatened Wildlife and Plants, as it was no longer considered endangered or threatened under the ESA (Angliss and Outlaw 2008). The Eastern North Pacific stock of gray whale is not considered a strategic stock under the MMPA.

Even though the stock is within Optimal Sustainable Population (OSP), which is the population size which falls within a range from the population level of a given species or stock which is the largest supportable within the ecosystem to the population level that results in maximum net productivity, abundance will rise and fall as the population adjusts to natural and man-caused factors affecting the carrying capacity of the environment (Rugh et al. 2005). In fact, it is expected that a population close to or at the carrying capacity of the environment will be more susceptible to fluctuations in the environment (Moore et al. 2001). Systematic counts of gray whales migrating south along the central California coast have been conducted by shore-based observers at Granite Canyon most years since 1967. The population size of the Eastern North Pacific gray whale stock has been increasing over the past several decades at a rate approximately between 2.5 to 3.3 percent per year since 1967. NMFS' population estimate is 19,126 individuals as reported in Angliss and Outlaw (2008), and the minimum population estimate as 17,752.

*Distribution* – The Eastern North Pacific population is found from the upper Gulf of California (Tershy and Breese 1991), south to the tip of Baja California, and up the Pacific coast of North America to the Chukchi and Beaufort seas. There is a pronounced seasonal north-south migration. The eastern North Pacific population summers in the shallow waters of the northern Bering Sea, the Chukchi Sea, and the western Beaufort Sea (Rice and Wolman 1971). The northern Gulf of Alaska (near Kodiak Island) is also considered a feeding area; some gray whales occur there year-round (Moore et al. 2007). Some individuals spend the summer feeding along the Pacific coast from southeastern Alaska to central California (Sumich 1984, Calambokidis et al. 1987, 2002). Photo-identification studies indicate that gray whales move widely along the Pacific coast and are often not sighted in the same area each year (Calambokidis et al. 2002). In October and November, the whales begin to migrate southeast through Unimak Pass and follow the shoreline south to breeding grounds on the west coast of Baja California and the southeastern Gulf of California (Braham 1984, Rugh 1984). The average gray whale migrates 4,050 to 5,000 nm (7,500 to 10,000 km) at a rate of 80 nm (147 km) per day (Rugh et al. 2001, Jones and Swartz 2002). Although some calves are born along the coast of California (Shelden et al. 2004), most are born in the shallow, protected waters on the Pacific coast of Baja California from Morro de Santo Domingo (28°N) south to Isla Creciente (24°N) (Urbán-Ramirez et al. 2003). The main calving sites are Laguna Guerrero Negro, Laguna Ojo de Liebre, Laguna San Ignacio, and Estero Soledad (Rice et al. 1981).

A group of gray whales known as the Pacific Coast Feeding Aggregation feeds along the Pacific coast between southeastern Alaska and northern to central California throughout the summer and fall (NMFS 2001, Calambokidis et al. 2002, Calambokidis et al. 2004b). The gray whales in this feeding aggregation are a small proportion (a few hundred individuals) of the overall eastern North Pacific population and arrive and depart from these feeding grounds concurrently with the migration to and from the wintering grounds (Calambokidis et al. 2002, Angliss and Outlaw 2008). Although some site fidelity is known to occur, there is considerable interannual variation since many individuals do not return to the same feeding site in successive years (Calambokidis et al. 2000, Calambokidis et al. 2004).

The Eastern North Pacific stock of gray whale transits through southern California during its northward and southward migrations between approximately December and June. Gray whales follow three routes from within approximately 5 to 100 nm (9 to 185 km) from shore (Bonnell and Dailey 1993). The nearshore route follows the shoreline between Point Conception and Point Vicente but includes a more direct line from Santa Barbara to Ventura and across Santa Monica Bay. Around Point Vicente or Point Fermin, some whales veer south towards Santa Catalina Island and return to the nearshore route near Newport Beach. Others join the inshore route that includes the northern chain of the Channel Islands along Santa Cruz Island and Anacapa Island and east along the Santa Cruz Basin to Santa Barbara Island and the Osborn Bank. From here, gray whales migrate east directly to Santa Catalina Island and then to Point Loma or Punta Descanso or southeast to San Clemente Island (SCI) and on to the area near Punta Banda. A significant portion of the Eastern North Pacific stock passes by SCI and its associated offshore waters (Carretta et al. 2000). The offshore route follows the undersea ridge from Santa Rosa Island to the mainland shore of Baja California and includes San Nicolas Island and Tanner and Cortes banks (Bonnell and Dailey 1993).

Peak abundance of gray whales off the coast of San Diego is January during the southward migration, and in March during the migration north; although females with calves, which depart Mexico later than males or females without calves, can be sighted from March through May or June (Leatherwood 1974; Poole 1984; Rugh et al. 2001; Stevick et al. 2002; Angliss and Outlaw 2008). Gray whales are infrequent migratory transients through the oceanside portions of SSTC only during cold-water months (Carretta et al. 2000). Migrating gray whales that might infrequently transit through SSTC would not be expected to forage, and would likely be present for minutes to less than one or two hours at typical travel speeds of 3 knots (approximately 3.5 miles per hour) (Perryman et al. 1999, Mate and Urbán-Ramirez 2003).

A mean group size of 2.9 gray whales was reported for both coastal (16 groups) and non-coastal (15 groups) areas around SCI (Carretta et al. 2000). The largest group reported was nine animals. The largest group reported by U.S. Navy (1998) was 27 animals. Gray whales are not expected in the SSTC from July through November (Rice et al. 1981), and are excluded from warm season analysis. Even though gray whale transitory occurrence is infrequent along SSTC, a cold season density is estimated at 0.014 animals per $km^2$ for purposes of conservative analysis (Table 3.9-1).

*Reproduction/Breeding* – Although some calves are born along the coast of southern California, most are born in the shallow, protected waters on the Pacific coast of Baja California (Urbán-Ramirez et al. 2003).

*Diving Behavior* – Gray whales dive to 160 to 200 feet for 5 to 8 minutes when foraging. In the breeding lagoons, dives are usually less than 6 minutes (Jones and Swartz, 2002), although dives as long as 26 minutes have been recorded (Harvey and Mate 1984). Gray whales may remain submerged near the surface for 7 to 10 minutes and travel 1600 feet or more before resurfacing to breathe when migrating. The maximum known dive depth is 560 feet (Jones and Swartz 2002). Migrating gray whales sometimes exhibit a unique snorkeling behavior—they surface cautiously, exposing only the area around the blow hole, exhale quietly without a visible blow, and sink silently beneath the surface (Jones and Swartz 2002). Mate and Urbán-Ramirez (2003) noted that 30 of 36 locations for a migratory gray whale with a satellite tag were in water <330 feet deep, with the deeper water locations all in the SCB within the Channel Islands. Whales in that study maintained consistent speed indicating directed movement. There has been only one study yielding a gray whale dive profile, and all information was collected from a single animal that was foraging off the west coast of Vancouver Island (Malcolm and Duffus 2000; Malcolm et al. 1996). They noted that the majority of time was spent near the surface on interventilation dives (<10 feet depth) and near the bottom (extremely nearshore in a protected bay with mean dive depth of 60 feet, range 46-72 feet depth). There was very little time spent in the water column between surface and bottom. Foraging depth on summer feeding grounds is between 160-200 feet (50-60 meters [m]) (Jones and Swartz 2002). Based on this very limited information, the following is a rough estimate of depth distribution for gray whales: 50 percent at <13 feet (surface and interventilation dives) and 50 at 13-59 feet. However, most gray whales would be expected at shallower depths during transit through southern California where foraging does not occur due to migration and limited suitable bottom prey habitat.

*Acoustics* – Au (2000) reviewed the characteristics of gray whale vocalizations. Gray whales produce broadband signals ranging from 100 hertz (Hz) to 4 kilohertz (kHz) (and up to 12 kHz) (Dahlheim et al. 1984, Jones and Swartz 2002). The most common sounds on the breeding and feeding grounds are knocks (Jones and Swartz 2002), which are broadband pulses from about 100 Hz to 2 kHz and most energy at 327 to 825 Hz. The source level for knocks is approximately 142 decibels referenced to 1 micropascal at 1 meter (dB re 1 µPa at 1 m) (Cummings et al. 1968). During migration, individuals most often produce low-frequency moans (Crane and Lashkari 1996). The structure of the gray whale ear is evolved for low-frequency hearing (Ketten 1992). The ability of gray whales to hear frequencies below 2 kHz has been demonstrated in playback studies (Cummings and Thompson 1971; Dahlheim and Ljungblad 1990; Moore and Clarke 2002) and in their responsiveness to underwater noise associated with broadband oil and gas activities (Malme et al. 1986; Moore and Clarke 2002). Gray whale responses to noise include changes in swimming speed and direction to move away from the sound source; abrupt behavioral changes from feeding to avoidance, with a resumption of feeding after exposure; changes in calling rates and call structure; and changes in surface behavior, usually from traveling to milling (e.g., Moore and Clarke 2002). Gailey et al. (2007) reported no apparent behavioral disturbance for Western Pacific gray whales in response to low-frequency seismic survey.

### 3.9.1.5.2 Odontocetes (Toothed whales)

### Bottlenose Dolphin

*Stock*—California Coastal

*Population Status* **–** There are two distinct populations of bottlenose dolphins within southern California, a coastal population found within 0.5 nm of shore and a larger offshore population (Hansen 1990, Bearzi et al. 2009). The California Coastal stock is the only one of these two stocks likely to regularly occur within the SSTC. The California Coastal stock of bottlenose dolphins is not listed under the ESA, and is not considered a strategic stock under the MMPA.

Based on photographic mark-recapture surveys conducted along the San Diego coast in 2004 and 2005, population size for the California Coastal stock of the bottlenose dolphin is estimated to be 323 individuals (CV = 0.13, 95 percent CI 259-430; Dudzik et al. 2006, Carretta et al. 2007). This estimate does not reflect that approximately 35 percent of dolphins encountered lack identifiable dorsal fin marks (Defran and Weller 1999). If 35 percent of all animals lack distinguishing marks, then the true population size would be closer to 450-500 animals (Carretta et al. 2007).

*Distribution* – The bottlenose dolphin California Coastal stock occurs at least from Point Conception south into Mexican waters, at least as far south as San Quintin, Mexico. In southern California, animals are found within 500 m of the shoreline 99 percent of the time and within 250 m 90 percent of the time (Hanson and Defran 1993). Occasionally, during warm-water incursions such as during the 1982–1983 El Niño event, their range extends as far north as Monterey Bay (Wells et al. 1990). Bottlenose dolphins in the SCB appear to be highly mobile within a narrow coastal zone (Defran et al. 1999), and exhibit little seasonal site fidelity to the SCB region (Defran and Weller 1999) and along the California coast; over 80 percent of the dolphins identified in Santa Barbara, Monterey, and Ensenada have also been identified off San Diego (Maldini-Feinholz 1996, Defran et al. 1999, Defran, unpublished data, Carretta et al. 2007, Bearzi 2009). Bottlenose dolphins could occur in the SSTC at variable frequencies and periods throughout the year based on localized prey availability (Defran et al. 1999). The coastal stock utilizes a limited number of fish prey species with up to 74 percent being various species of surfperch or croakers, a group of non-migratory year-round coastal inhabitants (Defran et al. 1999, Allen et al. 2006). For southern California, common croaker prey species include spotfin croaker, yellowfin croaker, and California corbina, while common surfperch species include barred surfperch and walleye surfperch (Allen et al. 2006). The corbina and barred surfperch are the most common surf zone fish where bottlenose dolphins have been observed foraging (Allen et al. 2006). Defran et al. (1999) postulated that the coastal stock of bottlenose dolphins showed significant movement within their home range (Central California to Mexico) in search of preferred but patchy concentrations of nearshore prey (i.e., croakers and surfperch). Bearzi et al (2009), in an analysis of coastal bottlenose dolphins in the vicinity of Santa Monica, also concluded that low individual re-sighting rates indicates a large coastal bottlenose dolphin distribution influenced by prey distribution. After finding concentrations of prey, animals may then forage within a more limited spatial extent to take advantage of this local accumulation until such time that prey abundance is reduced; the dolphins then shift location once again to be over larger distances (Defran et al. 1999, Bearzi 2009). An at-sea density estimate of 0.202 animals/km$^2$ was used for acoustic impact modeling for both the warm and cold seasons (Table 3.9-1).

*Reproduction/Breeding* – Newborn calves are seen throughout the year and reproduction may be influenced by productivity and food abundance (Urian et al. 1996).

*Diving Behavior* – California coastal stock bottlenose dolphins feed primarily on surf perches (Family Embiotocidae) and croakers (Family Sciaendae) (Norris and Prescott 1961; Walker 1981; Schwartz et al. 1992; Hanson and Defran 1993), and also consume squid (*Loligo opalescens*) (Schwartz et al. 1992). Navy bottlenose dolphins have been trained to reach maximum diving depths of about 984 feet (Ridgway et al. 1969). Reeves et al. (2002) noted that the presence of deep-sea fish in the stomachs of some offshore individual bottlenose dolphins suggests that they dive to depths of more than 1,638 feet. Dive durations up to 15 minutes have been recorded for trained individuals (Ridgway et al. 1969). Typical dives expected for the California Coastal Stock are more shallow and of a much shorter duration. However, bottlenose dolphins utilize the entire water column by feeding on prey that concentrate near the surface, midwater areas and benthic areas (Hastie et al. 2005).

*Acoustics* – Sounds emitted by bottlenose dolphins have been classified into two broad categories: pulsed sounds (including clicks and burst-pulses) and narrow-band continuous sounds (whistles), which usually are frequency modulated (FM). Whistles range in frequency from 0.8 to 24 kHz but can also go much higher. Clicks and whistles have a dominant frequency range of 110 to 130 kHz and a source level of 218 to 228 dB re 1 µPa at 1 m (peak to peak levels; Au 1993) and 3.5 to 14.5 kHz with a source level of 125 to 173 dB re 1 µPa at 1 m, respectively (Ketten 1998). The bottlenose dolphin has a functional high-frequency hearing limit of 160 kHz (Au 1993) and can hear sounds at frequencies as low as 40 to 125 Hz (Turl 1993). Inner ear anatomy of this species has been described (Ketten 1992). Electrophysiological experiments suggest that the bottlenose dolphin brain has a dual analysis system: one specialized for ultrasonic clicks and the other for lower-frequency sounds, such as whistles (Ridgway 2000). The audiogram of the bottlenose dolphin shows that the lowest thresholds occurred near 50 kHz at a level around 45 dB re 1 µPa (Nachtigall et al. 2000, Finneran and Houser 2006, Finneran and Houser 2007). Below the maximum sensitivity, thresholds increased continuously up to a level of 137 dB re 1 µPa at 75 Hz. Above 50 kHz, thresholds increased slowly up to a level of 55 dB re 1 µPa at 100 kHz, then increased rapidly above this to about 135 dB re 1 µPa at 150 kHz. Scientists have reported a range of best sensitivity between 25 and 70 kHz, with peaks in sensitivity occurring at 25 and 50 kHz at levels of 47 and 46 dB re 1 μPa (Nachtigall et al. 2000). Temporary threshold shifts (TTS) in hearing have been experimentally induced and behavioral responses observed in captive bottlenose dolphins (Ridgway et al. 1997, Schlundt et al. 2000, 2006, Nachtigall et al. 2003, Finneran et al. 2002, 2005, 2007b). Ridgway et al. (1997) observed changes in behavior at the following minimum levels for 1 second tones: 186 dB re 1 μPa at 3 kHz, 181 dB re 1 μPa at 20 kHz, and 178 dB re 1 μPa at 75 kHz. TTS levels were 194 to 201 dB re 1 μPa at 3 kHz, 193 to 196 dB re 1 μPa at 20 kHz, and 192 to 194 dB re 1 μPa at 75 kHz. Schlundt et al. (2000) exposed bottlenose dolphins to intense tones (0.4, 3, 10, 20, and 75 kHz); the animals demonstrated altered behavior at source levels of 178 to 193 dB re 1 μPa, with TTS after exposures between 192 and 201 dB re 1 μPa at 1 m (though one dolphin exhibited TTS after exposure at 182 dB re 1 μPa). Nachtigall et al. (2003) determined threshold for a 7.5 kHz pure tone stimulus. No shifts were observed at 165 or 171 dB re 1 μPa, but when the sound level reached 179 dB re 1 μPa, the animal showed the first sign of TTS. Recovery apparently occurred rapidly, with full recovery apparently within 45 minutes following sound exposure. TTS measured between 8 and 16 kHz (negligible or absent at higher frequencies) after 30 minutes of sound exposure (4 to 11 kHz) at 160 dB re 1 μPa (Nachtigall et al. 2004).

### 3.9.1.6 Non-Threatened and Non-Endangered Pinnipeds

#### 3.9.1.6.1 Phocids (True seals)

#### Pacific Harbor Seal

*Stock*—California

*Population Status* – The harbor seal is not listed under the ESA, and the California stock, some of which occurs in the SSTC, is not considered a strategic stock under the MMPA. The California stock has increased from the mid-1960s to the mid-1990s, although the rate of increase may have slowed during the 1990s as the population has reached and may be stabilizing at carrying capacity (Hanan 1996; Carretta et al. 2008).

A complete count of all harbor seals in California is impossible because some are always away from the haulout sites. A complete pup count (as is done for other pinnipeds in California) is also not possible because harbor seals are precocious, with pups entering the water almost immediately after birth (Carretta et al. 2008). Population size is estimated by counting the number of seals ashore during the peak haul-out period (May to July) and by multiplying this count by the inverse of the estimated fraction of seals on land.

Based on the most recent harbor seal counts (26,333 in May-July 2004, Lowry et al. 2005) and Hanan's revised correction factor, the harbor seal population in California is estimated by NMFS to number 34,233 (Carretta et al. 2008).Of the estimated California population (34,233), less than 30 percent are thought to reside within southern California due to lack of suitable haul-out sites because of significant beach urbanization (Lowry et al. 2008).

*Distribution* – Harbor seals are considered abundant throughout most of their range from Baja California to the eastern Aleutian Islands. An unknown number of harbor seals also occur along the west coast of Baja California, at least as far south as Isla Asuncion, which is about 100 miles south of Punta Eugenia. Peak numbers of harbor seals haul-out on land during late May to early June, which coincides with the peak of their molt. They favor sandy, cobble, and gravel beaches (Stewart and Yochem 1994), with multiple haul-outs identified along the California mainland and Channel Islands (Carretta et al. 2007).

There are limited at-sea density estimates for pinnipeds within southern California. Harbor seals do not make extensive pelagic migrations, but do travel 300 to 500 km on occasion to find food or suitable breeding areas (Carretta et al. 2008). Based on likely foraging strategies, Grigg et al. (2009) reported seasonal shifts in harbor seal movements based on prey availability. When at sea, they remain in the vicinity of haul-out sites and forage close to shore in shallow waters. In relationship to the entire California stock, harbor seals do not have a significant mainland California distribution south of Point Mugu due to beach urbanization and potential disturbance impacts.

While harbor seals could potentially be found in the SSTC throughout the year, their abundance is not expected to be large. However, as a conservative overestimate of likely occurrence in the SSTC, local densities for purposes of impact analysis are estimated at 0.010 animals/$km^2$ during the warm season (May to September) and 0.020 animals/$km^2$ during the cold season (November to April) (Table 3.9-1).

*Reproduction/Breeding* – Nursing of pups begins in late February, and pups start to become weaned in May. Breeding occurs between late March and early May on the offshore southern and northern Channel Islands. There are some mainland breeding sites, with the closest being the Children's Pool in La Jolla (approximately 14 miles north of Point Loma and the ROI).

*Diving Behavior* – While feeding, harbor seals dive to depths of 33 to 130 feet in the case of females with nursing pups, and 260 to 390 feet in the case of other seals and dives as deep as 1,463 feet have been recorded (Eguchi and Harvey 2005).

*Acoustics* – Harbor seals produce a variety of airborne vocalizations including snorts, snarls, and belching sounds (Bigg 1981). Adult males produce low frequency vocalizations underwater during the breeding season (Hanggi and Schusterman 1994; Van Parijs et al. 2003, Bjorgesaeter et al. 2004, Bodson et al. 2006). Male harbor seals produce communication sounds in the frequency range of 100 to 1,000 Hz (Bodson et al. 2006). The harbor seal hears almost equally well in air and underwater (Kastak and Schusterman 1998). Seals in general have an extremely broad range of best hearing sensitivity underwater, with flat audiograms between 1 and 50 kHz and good sensitivity to sounds between 100 Hz and 1 kHz (Kastelein et al. 2009). The high-frequency portion of their audiograms shows a functional upper frequency cutoff around 60 kHz. Peak hearing sensitivity for harbor seals is around 32 kHz in water and 12 kHz in air (Terhune and Turnball 1995, Kastak and Schusterman 1998, Wolski et al. 2003, Kastelein et al. 2009).

### 3.9.1.6.2 Otariids (Sea lions and fur seals)

### California Sea Lion

*Stock* – United States

*Population Status* – The California sea lion is not listed under the ESA, and the U.S. stock, some of which occurs in the SSTC, is not considered a strategic stock under the MMPA. The entire stock cannot be counted because all age and sex classes are never ashore at the same time. In lieu of counting all sea lions, pups are counted during the breeding season (because this is the only age class that is ashore in its entirety), and the number of births is estimated from the pup count after accounting for pup mortality (Carretta et al. 2007). The size of the population is then estimated from the number of births and the proportion of pups in the population. Censuses are conducted in July after all pups have been born. Based on these censuses, the U.S. Stock has increased from the early 1900s to the present with the exception of four major declines in the number of pups counted which occurred during El Niño events in 1983-1984, 1992-1993, 1998, and 2003 (Carretta et al. 2008).

The NMFS population estimate of the U.S. stock of California sea lions is 238,000 (Carretta et al. 2008), with a minimum estimate based on a 2005 shore-based survey of all age and sex classes of 141,842 (NMFS, unpubl. data, Carretta et al. 2008). Based on data from NMFS and presented in Carretta et al. 2007, there is indication that the California sea lion may have reached the environmental Carrying

Capacity. It is unclear, but possible, that the OSP level for sea lions as defined by the MMPA may have been reached but more data is needed to ensure the leveling in growth persists (Carretta et al. 2008).

*Distribution* – Nearly all of the U.S. Stock (more than 95 percent) breeds and gives birth to pups on San Miguel, San Nicolas, and Santa Barbara islands. Some movement has been documented between the U.S. Stock and Western Baja Mexico Stock, but rookeries in the United States are widely separated from the major rookeries of western Baja California. Smaller numbers of pups are born on San Clemente Island, the Farallon Islands, and Año Nuevo Island (Lowry et al. 1992). The California sea lion is by far the most commonly-sighted pinniped species at sea or on land in the vicinity of the SSTC. In California waters, sea lions represented 97 percent (381 of 393) of identified pinniped sightings at sea during the 1998–1999 NMFS surveys (Carretta et al. 2000). They were sighted during all seasons and in all areas with survey coverage from nearshore to offshore areas (Carretta et al. 2000). However, within context of the SSTC sea lions while potentially present at-sea, are not frequently sighted within the ocean waters of SSTC, but rather more commonly seen hauled-out on piers and buoys within and leading into San Diego Bay, north of the SSTC (Merkel Inc. 2008). In a study of California sea lion reaction to human activity, Holcomb et al. (2009) showed that in general sea lions are rather resilient to human disturbance.

The distribution and habitat use of California sea lions varies 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 to 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 through May), when they migrate back to the breeding colonies. Thus, adult males are present in offshore areas of the SSTC only briefly as they move to and from rookeries. Distribution 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 sea lions are presumed to remain near the rookeries, and remain near SSTC for most of the year. Adult females remain near the rookeries throughout the year. Most births occur from mid-June to mid-July (peak in late June).

Survey data from 1975 to 1978 were analyzed to describe the seasonal shifts in the offshore distribution of California sea lions near the Channel Islands (Bonnell and Ford 1987). The seasonal changes in the center of distribution were attributed to changes in the distribution of the prey species. If California sea lion distribution is determined primarily by prey abundance as influenced by variations in local, seasonal, and interannual oceanographic variation, these same areas might not be the center of sea lion distribution every year. Melin et al. (2008) showed that foraging female sea lions showed significant variability in individual foraging behavior, and foraged further offshore and at deeper depths during El Niño years as compared to non-El Niño years.

There are limited published at-sea density estimates for pinnipeds within southern California. The density of California sea lions is higher during cold-water months ($0.190/km^2$) versus the warmer months ($0.060/km^2$) (Table 3.9-1). At-sea densities likely decrease during warm-water months because females spend more time ashore to give birth and attend their pups. Radio-tagged female California sea lions at San Miguel Island spent approximately 70 percent of their time at sea during the nonbreeding season (cold-water months) and pups spent an average of 67 percent of their time ashore during their mother's absence (Melin et al. 2000). Different age classes of California sea lions are found in the SSTC throughout the year (Lowry et al. 1992). Although adult male California sea lions feed in areas north of the SSTC, animals of all other ages and sexes spend most, but not all, of their time feeding at sea during winter; thus, winter estimates likely are somewhat low. During warm-water months, a high proportion of the adult males and females are hauled out at terrestrial sites during much of the period, so the summer estimates are low to a greater degree.

*Reproduction/Breeding* – The pupping and mating season for sea lions begins in late May and continues through July (Heath 2002).

*Diving Behavior* – Over one third of the foraging dives by breeding females are one to two minutes in duration; 75 percent of dives are less than three minutes, and the longest recorded dive was 9.9 minutes (Feldkamp et al. 1989). Approximately 45 percent of dives were to depths of 66 – 160 feet (Feldkamp et al. 1989). Costa et al. (2007) reported both shallow and deep dives greater than 328 feet by both male and female sea lions. Melin et al. (2008) documented mean dives depths of 62 to 915 feet but that most individuals could make dives to 1,312 feet. Much of the variation in duration and depth of dives appears to be related to sea lions foraging on vertically-migrating prey. Longer dives to greater depths occur during the day, and shorter dives to shallower depths occur at night, when prey migrate toward the surface (Feldkamp et al. 1989, Costa et al. 2007, Melin et al. 2008).

*Acoustics* – California sea lions produce two types of underwater sounds: clicks (or short-duration sound pulses) and barks (Schusterman et al. 1966, 1967, Schusterman and Baillet 1969). All underwater sounds have most of their energy below 4 kHz (Schusterman et al. 1967). The range of overall hearing sensitivity underwater is between 0.25 and 64 kHz (Schusterman et al. 1972, Kastak and Schusterman 1998, Finneran et al 2003, Southall et al 2005). The range of maximal sensitivity presented in this study was between one and 28 kHz with best sensitivity at 16 kHz. Between 28 and 36 kHz there is a loss in sensitivity of 60 dB/octave. However, sea lions can hear frequencies at least as high as 64 kHz, given intense acoustic signals. The California sea lion shows poor hearing at frequencies below 1,000 Hz (Kastak and Schusterman 1998). The best range of sound detection is from 2.0 to 16 kHz (Schusterman, 1974). Kastak and Schusterman (2002) determined that hearing sensitivity worsens with depth—hearing thresholds were lower in shallow water, except at the highest frequency tested (35 kHz), where this trend was reversed.

In-air, California sea lions make incessant, raucous barking sounds; these have most of their energy at less than 2 kHz (Schusterman et al. 1967). Males vary both the number and rhythm of their barks depending on the social context; the barks appear to control the movements and other behavior patterns of nearby sea lions (Schusterman 1977). Females produce barks, squeals, belches, and growls in the frequency range of 0.25 to 5.0 kHz, while pups make bleating sounds at 0.25 to 6.0 kHz. Peak sensitivities in air are shifted towards lower frequencies; the effective upper hearing limit is approximately 36 kHz (Schusterman 1974).

### 3.9.1.7 Current Mitigation Measures

The physical topography (Sections 3.2 and 3.5), lack of significant marine mammal occurrence within the SSTC, and the type of proposed Navy training events at SSTC allow for effective mitigation procedures. Gray whales are seldom present in the shallow offshore waters of the SSTC, or if migrating near the outer edge of the boat lanes rarely present for longer than the one the two hours it would take to transit past SSTC. If large marine mammals such as gray whales were to approach a training area—even far beyond the mitigation zone—they would be immediately obvious to the shore or safety-boat observers. As described in Section 3.9.1.4, the SSTC is not known to be a preferred feeding site for small marine mammals such as bottlenose dolphins and pinnipeds, although their presence cannot be ruled out. Therefore, the principal concern for mitigation is the protection of dolphins and pinnipeds that occasionally transit through the site.

Based on NMFS promulgated criteria and in-water propagation of sound and underwater detonations described in Section 3.9.2.3, the buffer zones described below are derived from by empirical data (very shallow water [VSW]) and modeled estimates of propagated peak-pressure and energy (within the range of hearing of marine mammal species) of the range to onset-TTS described in Section 3.9.2.4.

The following mitigation measures, which are situation/location dependent for underwater detonations and Elevated Causeway System (ELCAS) training, incorporate existing range procedures at SSTC and are consistent with existing training objectives and activities, as well as established human safety procedures. In case of unanticipated conflict, human safety considerations will take precedence and such conflicts are always used to make incremental improvements in the procedures used in subsequent activities.

Mitigation measures for very shallow water (VSW) underwater detonations on SSTC oceanside (0-24 feet):

1. Easily visible anchored floats will be positioned on a 1,200 foot or 400 yard radius of a roughly semi-circular zone (the shoreward half being bounded by shoreline and immediate off-shore water) around the detonation location for small explosive exercises at the SSTC. These mark the outer limits of the mitigation zone.
2. For each VSW underwater detonation event, a safety-boat with a minimum of one observer is launched 30 or more minutes prior to detonation and moves through the area around the detonation site. The task of the safety observer is to exclude humans from coming into the area and to augment a shore observer's visual search of the mitigation zone for marine mammals. The safety-boat observer is in constant radio communication with the exercise coordinator and shore observer discussed below.
3. A shore-based observer will also be deployed for VSW detonations in addition to boat based observers. The shore observer will indicate that the area is clear of marine mammals after 10 or more minutes of continuous observation with no marine mammals having been seen in the mitigation zone (1,200 feet or 400 yards) or moving toward it.
4. At least 10 minutes prior to the planned initiation of the detonation event-sequence, the shore observer, on an elevated on-shore position, begins a continuous visual search with binoculars of the mitigation zone. At this time, the safety-boat observer informs the shore observer if any marine mammal has been seen in the zone and, together, both search the surface within and beyond the mitigation zone for marine mammals (and other protected species such as sea turtles).
5. The observers (boat and shore based) will indicate that the area is not clear any time a marine mammal is sited in the mitigation zone or moving toward it and, subsequently, indicate that the area is clear of marine mammals when the animal is out and moving away and no other marine mammals have been sited.
6. Initiation of the detonation sequence will only began on final receipt of an indication from the shore observer that the area is clear of marine mammals and will be postponed on receipt of an indication from that any observer that the area is not clear of marine mammals.
7. Following the detonation, visual monitoring of the mitigation zone continues for 30 minutes for the appearance of any marine mammal in the zone. Any marine mammal appearing in the area will be observed for signs of possible injury.
8. Any marine mammal observed after an VSW underwater detonation either injured or exhibiting signs of distress will be reported to Navy environmental representatives from the regional Navy shore commander (Commander, Navy Region Southwest) and U.S. Pacific Fleet, Environmental Office, San Diego Detachment. The Navy will report these events to the Stranding Coordinator of NMFS' Southwest Regional Office using Marine Mammal Stranding communication trees and contact procedures established for the Southern California Range Complex,. These voice or email reports will contain the date and time of the sighting, location (or if precise latitude and longitude is not currently available, then the approximate location in reference to an established SSTC beach feature), species description (if known), and indication of the animals status.

Mitigation measures for shallow water underwater detonations on SSTC oceanside (24-72 feet):

1. A mitigation zone of 1,500 feet or 500 yards will be established around each underwater detonation point. This mitigation zone is based on the maximum range to onset-TTS (either 23 psi or 182 dB).
2. A minimum of two boats, including but not limited to small zodiacs and 11-meter Rigid Hulled Inflatable Boats (RHIB) will be deployed. One boat will act as an observer platform, while the other boat is typically the diver support boat.
3. Two observers with binoculars on one small craft\boat will survey the detonation area and the mitigation zone for marine mammals from at least 30 minutes prior to commencement of the scheduled explosive event and until at least 30 minutes after detonation.
4. In addition to the dedicated observers, all divers and boat operators engaged in detonation events can potentially monitor the area immediately surrounding the point of detonation for marine mammals (and other protected species such as sea turtles).
5. If a marine mammal is sighted within the 1,500 foot or 500 yard mitigation zone or moving towards it, underwater detonation events will be suspended until the marine mammal has voluntarily left the area and the area is clear of marine mammals for at least 30 minutes.
6. Immediately following the detonation, visual monitoring for marine mammals within the mitigation zone will continue for 30 minutes. Any marine mammal observed after an underwater detonation either injured or exhibiting signs of distress will be reported to Navy environmental representatives from the regional Navy shore commander (Commander, Navy Region Southwest) and U.S. Pacific Fleet, Environmental Office, San Diego Detachment. The Navy will report these events to the Stranding Coordinator of NMFS' Southwest Regional Office using Marine Mammal Stranding communication trees and contact procedures established for the Southern California Range Complex. These voice or email reports will contain the date and time of the sighting, location (or if precise latitude and longitude is not currently available, then the approximate location in reference to an established SSTC beach feature), species description (if known), and indication of the animal's status.

Mitigation for ELCAS/Pile Driving Activities on SSTC oceanside:

1. A mitigation zone will be established at 150 feet or 50 yards from ELCAS pile driving and pile removal events. This mitigation zone is base on the predicted range to Level A harassment (180 dB RMS) for cetaceans, and is being applied conservatively to both cetaceans and pinnipeds.
2. Monitoring will be conducted within the 150 foot or 50 yard mitigation zone surrounding ELCAS pile driving and removal events for the presence of marine mammals (and other protected species such as sea turtles) before, during, and after pile driving and removal events.
3. If marine mammals are found within the 150 foot or 50 yard mitigation zone, pile removal events will be halted until the marine mammals (or sea turtles) have voluntarily left the mitigation zone.
4. Monitoring for marine mammals (or sea turtles) will take place concurrent with pile removal events and 30 minutes prior to pile driving and removal commencement. A minimum of one trained observer will be placed on shore, on the ELCAS, or in a boat at the best vantage point(s) practicable to monitor for marine mammals.
5. Monitoring observer(s) will implement shut–down/delay procedures when applicable by calling for shut–down to the hammer operator when marine mammals (or sea turtles) are sighted within the mitigation zone.

6. Soft Start - Providing additional protection for marine mammals (and sea turtles), ELCAS pile driving includes a soft start as part of normal construction procedures. The pile driver increases impact strength as resistance goes up. At first, the pile driver piston drops a few inches. As resistance goes up, the pile driver piston will drop from a higher distance thus providing more impact due to gravity. This will allow marine mammals in the project area to vacate or begin vacating the area minimizing potential harassment. The ELCAS soft start is not the traditional soft-start used in bigger civilian construction projects, and doesn't include a waiting period (an initial set of several strikes from the impact hammer at 40-60 percent energy levels, followed by a one minute waiting period, then two subsequent 3 strike sets), but does provide additional time for marine mammals to vacate the area. Including waiting periods as part of training would be inconsistent with Navy training objectives that requires the ELCAS to be constructed as quickly as possible in real world conditions to ensure rapid supply of equipment and materials to shore in a hostile territory during wartime, or during humanitarian assistance operations.

#### 3.9.1.7.1 Mitigation Effectiveness

Mitigation of potential impacts depends on observers and environmental conditions during the training event, among other things. For underwater detonations and ELCAS training, observers watch a buffer zone for the presence of marine mammals. These zones make best use of the available platforms and assets. The efficacy of visual detection depends on several factors related to the observers, environment, and monitoring platforms.

Training activities involving underwater detonation occur during daylight hours with Beaufort sea-states of three or less at SSTC. Training activities involving ELCAS occur 24-hours per day, but involve the use of floodlights at night to ensure the visibility of operations. Mitigation zones are clearly visible from the shore where the beach slopes up to provide an elevated position for a stable observation deck, on the ELCAS itself, and/or in boats for complete binocular-aided observation of the mitigation area. More importantly, physical characteristics of the environment and local circumstances substantially increase the probability of animals being on the surface. That is, conditions are substantially better for visual mitigation at SSTC than those encountered during offshore activities when mitigation is used and deep-diving mammals can be encountered. More specifically, negative biases (availability and observer) are much reduced at SSTC compared to deeper water locations where water depth exceeds the diving abilities of sea lions, harbor seals, bottlenose dolphins, and gray whales.

Given these near-shore characteristics, the percent detection or detection effectiveness for various species that are usually associated with deeper at-sea zones and other methods of observation do not apply nor do the detection probabilities associated with assessment surveys in deep water from ships or planes (Barlow 1995, Barlow 1999, Barlow et al. 2001, Buckland et al. 1993). While survey detection probabilities may not apply, environmental variables (sea state, relative visibility, glare, swell height) and observer training and locations at SSTC favor very good detection rates. In addition, for personnel safety reasons, VSW underwater detonations are conducted during daylight hours and not conducted if sea states get higher than Beaufort 3, meaning that, in general, there will be less surface chop and smoother seas thus enhancing marine mammal detection.

Mysticetes such as gray whales are rarely, if ever, present in the VSW portion of the SSTC. The VSW area of SSTC on the ocean side is not known to be a preferred feeding site for small marine mammals. The principal mitigation concern during underwater detonations is for protection of small odontocetes (dolphins) and pinnipeds, most likely California sea lions, that may occasionally transit through. Were marine mammals to approach the VSW zone, even at a distance beyond the 1,200 foot mitigation zone, it is likely they would be detectable to the shore or safety-boat observers. The very shallow depths maximizes the probability of marine mammals being on the surface and increases probability of visual detection. When combined with the low numbers of marine mammals typically in these zones, the few marine mammals in or transiting through these shallow areas are not diving deeply or for extended periods of time.

Because of the coastal nature of SSTC and near-shoreline volumes, marine animals will be at the surface much more frequently and not diving deeply or for extended periods of time as is assumed in deeper water. Though they will be easily sighted, numbers of marine mammals in the vicinity of activities are expected to be quite low, as there are no seal or sea lion haul-outs nor are there intensively used dolphin feeding grounds within the SSTC.

Finally, similar to other Navy range complexes, a report on SSTC underwater detonations by explosive type, observations of interactions with marine mammals, and associated marine mammal monitoring will be reported annually to NMFS' Office of Protected Resources.

#### 3.9.1.7.2 ELCAS Mitigation Considered but Rejected

As discussed in Section 3.9.1.7, the Navy will monitor an ELCAS mitigation zone for the presence of marine mammals (and sea turtles) before, during, and after pile driving and removal events. If marine mammals (or sea turtles) are found in the mitigation zone, pile driving and removal will be halted until the marine mammals have voluntarily left the zone. Mitigation measures that other, generally longer term and much larger pier and bridge construction projects have implemented in the past are listed as follows, with an explanation of why the Navy is not proposing to implement them.

A significant reason for not considering these mitigations is that the engineering needed to both develop, and more importantly field deploy, these mitigations is often not available under the remote expeditionary nature that characterizes field training with the ELCAS. There is generally a lack of facility based infrastructure to support the mitigation deployment. In addition, these measures are part of much longer term (sometime several years) projects where deployment time of the mitigation can be factored into a given construction project over several months. By contrast, an entire ELCAS training event from construction, to use, to disassembly usually is only scheduled to occur for periods of up to two to three weeks or shorter. Deploying of additional significant hardware-based mitigations would not be practical, nor meet the Navy's Title 10 requirements for training. The range of additional ELCAS mitigations considered but rejected fall into two classes. One is deploying various engineering solutions such as sound dampening measure or material change, and the other is seasonal or daily restrictions.

1) Adding sound dampening measures - Following are a list of sound dampening measures that other pier construction and repair projects have considered or used in the past that help to attenuate some sound from pile driving, but for which the Navy asserts are not practical for ELCAS training. These measures are not used in actual ELCAS operations overseas or easily adaptable for ELCAS training at SSTC. In addition, the purpose of ELCAS training is to teach personnel to construct an ELCAS as they would overseas in as quick a manner as possible. Adding in sound dampening measures that are not used in real world conditions would not only confuse personnel trying to learn and recertify their capabilities in ELCAS construction, but divert the limited amount of Navy personnel available to ELCAS support units away from necessary training while they implement these measures.

*Bubble curtain* - Air bubble curtains infuse the area surrounding the pile with air bubbles, creating a bubble screen that inhibits the propagation of some sound from pile driving and removal. The effectiveness of air curtain design in reducing underwater sound propagation is highly variable ranging from reduction of zero to perhaps 15 dB in source level (CADOT 2009). However, the exact optimum design of air bubble curtains is still slightly qualitative, based on site conditions and engineering issues. As designed, there is no latitude in the ELCAS construction equipment to allow installation of bubble curtains. Typical bubble curtain arrangements for larger pier construction projects would not have the necessary support (power, air compressors, piping, etc.) found at remote ELCAS deployment sites within the SSTC.

*Cofferdam* - Cofferdams are temporary structures used to isolate an area generally submerged underwater from the water column. Cofferdams are most commonly fabricated from sheet piling or inflatable water bladders. As designed, there is no latitude in the ELCAS construction equipment to allow installation of cofferdams;

*Isolation casing* - Isolation casings are hollow casings slightly larger in diameter than the piling to be driven. The casing, typically a larger hollow pile, is inserted into the water column and bottom substrate. The casing then is dewatered, and the piling is driven within the dewatered isolation casing. As designed, there is no latitude in the ELCAS construction equipment to allow installation of isolation cases.

*Cushion blocks* - Cushion blocks are blocks of material used with impact hammer pile drivers. They consist of blocks of material placed atop a piling during pile driving to minimize the noise generated while driving the pile. Materials typically used for cushion blocks include wood, nylon, and micarta blocks. The effectiveness of these materials within both the construction world and as potential ELCAS mitigation is not sufficiently studied, and its unknown if cushion blocks would effectively and significantly lower pile driving noise levels. Use of cushion blocks would require additional time to prepare and deploy on each ELCAS pile. The result could be significant time delays between individual ELCAS pile driving resulting is delays to the overall ELCAS training.

*Changing pile material or size* - Different pile materials, such as concrete, and/or smaller piles could reduce the sound intensity and associated ZOIs during ELCAS construction at SSTC. The ELCAS, however, is a pre-manufactured system using 24 inch steel piles, designed for optimal operation overseas and deployment on specified Navy cargo ships. Navy personnel are not able to use incompatible piles in this pre-manufactured system, which might compromise the ELCAS' military specifications and design.

2) Seasonal or Daily Restrictions - Changing the time when pile driving or removal occurs is another construction based technique. The following are two temporal measures that other civilian pier construction and repair projects have considered or used in the past to help minimize impacts to marine mammals, but for which the Navy asserts are not practical for ELCAS training.

*Constructing ELCAS at a different time of year* - Shifting ELCAS training to summer months may help with transitory migratory species, such as the gray whale, which are not present during the summer within southern California. The actual amount of pile removal exposures for gray whales is very small, and as explained earlier much more easy to mitigate with the applicable mitigation zone. Navy training cycles and curriculums are set to a fixed annual training schedule; however, to ensure that personnel are adequately trained for deployment, and resources are available to conduct that training. Restricting ELCAS training by season would adversely impact the Navy's ability to ensure that personnel are adequately prepared for deployment, while not lending significant protection to marine mammals.

*Daylight Restriction* - Restricting ELCAS pile driving and removal to only daylight hours could conceivably avoid impact to marine mammals by making visual sighting within the ELCAS mitigation zone easier. However, ELCAS operations in real world conditions are performed 24 hours a day to enable forces to offload materials from the ship to shore (via the ELCAS) as quickly as possible. Sailors need to train for these real world conditions, including night-time operations. Navy training cycles and curriculums, as well as resulting field deployments to training sites such as the SSTC, are set to a fixed annual training schedule with daily milestones of accomplishments that also include night time training. In addition, while under construction, there is significant floodlight use both on the ELCAS itself and at the pile driving or removal location pointing into the water so that operators can observe the results of these events. This same lighting would afford additional sighting opportunities for marine mammals within the 50 yard ELCAS mitigation zone at night.

### 3.9.2 Environmental Consequences

Potential effects on marine mammals from SSTC activities can be separated into two broad categories: acoustic and nonacoustic impacts, both of which are addressed in this EIS. The possibility that human-generated sound could harm marine mammals or significantly interfere with their “normal” activities is an issue of increasing concern (NRC 2005). Evaluating potential acoustic effects requires an understanding of the technical issues inherent to sound and its propagation in the ocean environment. In addition, it is important to understand potential impacts in the context of the regulatory framework. The following subsections of this EIS provide information on the analytical framework used to assess potential acoustic impacts, including a description of both regulatory and conceptual issues. The criteria used to model and assess marine mammal responses to sound are then summarized. A description of current mitigation measures and their effectiveness is also provided. Finally, the remaining subsections evaluate the potential for the specific Navy SSTC activities to result in impacts to marine mammals.

#### 3.9.2.1 General Approach to Analysis

Each alternative analyzed in this EIS includes multiple types of training activities (for example, Mine Countermeasures, Amphibious Operations, Naval Special Warfare). Likewise, many activities (for example, vessel movements, aircraft overflights, and underwater detonations) are common to many training scenarios. Accordingly, the analysis of the consequences to marine mammals is organized by specific activity and/or stressors associated with that activity.

The following general steps were used to analyze the potential environmental consequences of the alternatives to marine mammals:

- Identify those aspects of the Proposed Action that are likely to act as stressors to marine mammals by having a direct or indirect effect on the physical, chemical, and biotic environment. As part of this step, the spatial extent of these stressors, including changes in that spatial extent over time, were identified. The results of this step identified those aspects of the Proposed Action that required detailed analysis in this EIS.
- Identify marine mammal resources that may occur in the action area.
- Identify the marine mammal resources that are likely to co-occur with the stressors in space and time, and the nature of that co-occurrence (exposure analysis).
- Determine whether and how marine mammals are likely to respond given their exposure to the proposed activities based on available scientific knowledge of their probable responses.
- Consider the effectiveness of proposed mitigation measures in avoiding, offsetting, and reducing the intensity of any potential adverse impacts to marine mammals.
- Determine implications of the estimated risks under the MMPA.

Following this general approach, the types of activities that could affect marine mammals include underwater detonations, aircraft activities (related to sound propagation into the water column), marine vessel activities (small boats, service craft, etc.), and amphibious and beach activities. Marine vessels provide support to a host of activities and are subsequently analyzed for effect; however, portions of training activities in which interactions between personnel/craft and marine mammals are anticipated to be rare, such as swimming, Self-Contained Underwater Breathing Apparatus (SCUBA) diving, or activities that utilize only non-motorized Combat Raiding Rubber Craft (CRRCs) (Activities 54, 55, 56, 60, 64, 67, 69, 70, 71, and 73, Table 2-1) are excluded from individual activity analysis as potential impacts from interactions would be minimal to non-existent. Training activities that occur exclusively on the land portion of SSTC (Activities 17, 19, 31, 36, 48, 50, 54, 55, 58, 59, 61-66, 68, 72, 74-76, and N10, Table 2-1 and Table 2-2) are not anticipated to cause localized increases in turbidity that are in excess of nearshore processes or discharge of pollutants into the water column offshore; therefore, they are also excluded from this analysis. Beach and inland activities have a low potential for impact on marine mammals because there are no breeding or haul-out areas within the SSTC ROI. Based on both anecdotal observations and through several recent Navy funded surveys, there are few marine mammal species present within the back portions of San Diego Bay south of the Coronado Bay Bridge (Merkel Inc. 2008).

#### 3.9.2.2 Regulatory and Biological Framework

The following discussion outlines the biological framework within which potential impacts can be categorized. This discussion includes an explanation of potential indicators of physiological and behavioral effects, MMPA Level A and Level B harassment criteria, harassment zones, temporary threshold shift (TTS), and auditory masking. The biological framework can then be combined with the existing regulatory framework of injury (MMPA Level A harassment) and behavioral disruption (MMPA Level B harassment) to establish appropriate levels of impact. The Navy submitted an application for an Incidental Harassment Authorization to NMFS per the requirements of MMPA for proposed training activities that have the potential to incidentally take marine mammals.

As summarized by the National Academies of Science, the possibility that human-generated sound could harm marine mammals or significantly interfere with their "normal" activities has been an issue of concern (National Research Council [NRC] 2005). Assessing whether a sound may disturb or injure a marine mammal involves understanding the characteristics of the acoustic sources, the marine mammals that may be present in the vicinity of the sound, and the effects that sound may have on the physiology and behavior of those marine mammals. Although it is known that sound is important for marine mammal communication, navigation, and foraging (NRC 2003, NRC 2005), there are many unknowns in assessing the effects and significance of marine mammal responses to sound exposures related to the context for the exposure and the disposition of the marine mammal (Southall et al. 2007). For this reason, the Navy enlisted the expertise of NMFS as a cooperating agency. Their input assisted the Navy in developing a conceptual analytical framework for evaluating what sound levels marine mammals might receive as a result of Navy training actions, whether marine mammals might respond to these exposures, and whether that response might have a mode of action on the biology or ecology of marine mammals such that the response should be considered a potential harassment. From this framework of evaluating the potential for harassment incidents to occur, an assessment of whether acoustic sources might impact populations, stocks or species of marine mammals can be conducted.

Starting with a sound source, the attenuation of an emitted sound due to propagation loss is determined. Uniform animal distribution is overlaid onto the calculated sound fields to assess if animals are physically present at sufficient received sound levels to be considered "exposed" to the sound. If the animal is determined to be exposed, two possible scenarios must be considered with respect to the animal's physiology—effects on the auditory system and effects on nonauditory system tissues. These are not independent pathways and both must be considered since the same sound could affect both auditory and nonauditory tissues. Note that the model does not account for any animal response; rather the animals are considered stationary, accumulating energy until the threshold is tripped. Potential impacts to the auditory system are assessed by considering the characteristics of the received sound (e.g., amplitude, frequency, duration) and the sensitivity of the exposed animals. Some of these assessments can be numerically based (e.g., TTS, Permanent Threshold Shift [PTS], perception). Others will be necessarily qualitative, due to lack of information, or will need to be extrapolated from other species for which information exists. Potential physiological responses to the sound exposure are ranked in descending order, with the most severe impact (auditory trauma) occurring at the top and the least severe impact occurring at the bottom (the sound is not perceived).

1. Auditory trauma represents direct mechanical injury to hearing related structures, including tympanic membrane rupture, disarticulation of the middle ear ossicles, and trauma to the inner ear structures such as the organ of Corti and the associated hair cells. Auditory trauma is always

injurious but could be temporary and not result in PTS. Auditory trauma is always assumed to result in a stress response.

2. Auditory fatigue refers to a loss of hearing sensitivity after sound stimulation. The loss of sensitivity persists after, sometimes long after, the cessation of the sound. The mechanisms responsible for auditory fatigue differ from auditory trauma and would primarily consist of metabolic exhaustion of the hair cells and cochlear tissues. The features of the exposure (e.g., amplitude, frequency, duration, temporal pattern) and the individual animal's susceptibility would determine the severity of fatigue and whether the effects were temporary (TTS) or permanent (PTS). Auditory fatigue (PTS or TTS) is always assumed to result in a stress response.

3. Sounds with sufficient amplitude and duration to be detected among the background ambient noise are considered to be perceived. This category includes sounds from the threshold of audibility through the normal dynamic range of hearing (i.e., not capable of producing fatigue). To determine whether an animal perceives the sound, the received level, frequency, and duration of the sound are compared to what is known of the species' hearing sensitivity.

Since audible sounds may interfere with an animal's ability to detect other sounds at the same time, perceived sounds have the potential to result in auditory masking. Unlike auditory fatigue, which always results in a stress response because the sensory tissues are being stimulated beyond their normal physiological range, masking may or may not result in a stress response, depending on the degree and duration of the masking effect. Masking may also result in a unique circumstance where an animal's ability to detect other sounds is compromised without the animal's knowledge. This could conceivably result in sensory impairment and subsequent behavior change; in this case, the change in behavior is the lack of a response that would normally be made if sensory impairment did not occur. For this reason, masking also may lead directly to behavior change without first causing a stress response. The features of perceived sound (e.g., amplitude, duration, temporal pattern) are also used to judge whether the sound exposure is capable of producing a stress response. Factors to consider in this decision include the probability of the animal being naïve or experienced with the sound (i.e., what are the known/unknown consequences of the exposure).

By extension, this does not result in a stress response (not perceived). Potential impacts to tissues other than those related to the auditory system are assessed by considering the characteristics of the sound (e.g., amplitude, frequency, duration) and the known or estimated response characteristics of nonauditory tissues. Some of these assessments can be numerically based (e.g., exposure required for rectified diffusion). Others will be necessarily qualitative, due to lack of information. Each of the potential responses may or may not result in a stress response.

1. Direct tissue effects – Direct tissue responses to sound stimulation may range from tissue shearing (injury) to mechanical vibration with no resulting injury. Any tissue injury would produce a stress response, whereas noninjurious stimulation may or may not.

2. Indirect tissue effects – Based on the amplitude, frequency, and duration of the sound, it must be assessed whether exposure is sufficient to indirectly affect tissues. For example, the hypothesis that rectified diffusion occurs is based on the idea that bubbles that naturally exist in biological tissues can be stimulated to grow by an acoustic field. Under this hypothesis, one of three things could happen: (1) bubbles grow to the extent that tissue hemorrhage occurs (injury); (2) bubbles develop to the extent that a complement immune response is triggered or nervous tissue is subjected to enough localized pressure that pain or dysfunction occurs (a stress response without injury); or (3) the bubbles are cleared by the lung without negative consequence to the animal. The probability of rectified diffusion, or any other indirect tissue effect, will necessarily be based on what is known about the specific process involved. Given the single point source underwater explosives and broadband impulsive sounds from pile driving, the two main underwater activities with potential to affect marine mammals at SSTC, indirect tissue effects are not a factor. While

presented here in context of the framework discussion, indirect tissue effects are not considered in the impact analysis discussed later.

3. No tissue effects – The received sound is insufficient to cause either direct mechanical) or indirect effects to tissues. No stress response occurs.

#### 3.9.2.2.1 Stress Response

The acoustic source is considered a potential stressor if, by its action on the animal, via auditory or nonauditory means, it may produce a stress response in the animal. The term "stress" has taken on an ambiguous meaning in the scientific literature, but with respect to the discussions of allostasis and allostatic loading, the stress response will refer to an increase in energetic expenditure that results from exposure to the stressor and which is predominantly characterized by either the stimulation of the sympathetic nervous system or the hypothalamic-pituitary-adrenal axis (Reeder and Kramer 2005). The presence and magnitude of a stress response in an animal depends on a number of factors. These include the animal's life history stage (e.g., neonate, juvenile, adult), the environmental conditions, reproductive or developmental state, and experience with the stressor. Not only will these factors be subject to individual variation, but they will also vary within an individual over time. Prior experience with a stressor may be of particular importance as repeated experience with a stressor may dull the stress response via acclimation (St. Aubin and Dierauf 2001). In considering potential stress responses of marine mammals to acoustic stressors, each of these should be considered. For example, is the acoustic stressor in an area where animals engage in breeding activity? Are animals in the region resident and likely to have experience with the stressor (i.e., repeated exposures)? Is the region a foraging ground or are the animals passing through as transients? What is the ratio of young (naïve) to old (experienced) animals in the population? It is unlikely that all such questions can be answered from empirical data; however, they should be addressed in any qualitative assessment of a potential stress response as based on the available literature.

Marine mammals naturally experience stressors within their environment and as part of their life histories. Changing weather and ocean conditions, exposure to diseases and naturally occurring toxins, lack of prey availability, social interactions with conspecifics, and interactions with predators all contribute to the stress a marine mammal experiences. In some cases, naturally occurring stressors can have profound impacts on marine mammals; for example, chronic stress, as observed in stranded animals with long-term debilitating conditions (e.g., disease), has been demonstrated to result in an increased size of the adrenal glands and an increase in the number of epinephrine-producing cells (Clark et al. 2006). Anthropogenic activities have the potential to provide additional stressors above and beyond those that occur naturally. Potential stressors resulting from anthropogenic activities must be considered not only as to their direct impact on the animal but also as to their cumulative impact with environmental stressors already experienced by the animal.

Studies on the stress response of odontocete cetaceans to acute acoustic stimuli were previously discussed (Thomas et al., 1990, Miksis et al., 2001, Romano et al. 2004). Other types of stressors include the presence of vessels, fishery interactions, acts of pursuit and capture, the act of stranding, and pollution. In contrast to the limited amount of work performed on stress responses resulting from sound exposure, a considerably larger body of work exists on stress responses associated with pursuit, capture, handling and stranding. Pursuit, capture and short-term holding of belugas has been observed to result in a decrease in thyroid hormones and increases in epinephrine (St. Aubin and Geraci 1988) . In dolphins, the trend is more complicated with the duration of the handling time potentially contributing to the magnitude of the stress response (St. Aubin et al. 1996, Ortiz and Worthy 2000, St. Aubin 2002). Elephant seals demonstrate an acute cortisol response to handling, but do not demonstrate a chronic response; on the contrary, adult females demonstrate a reduction in the adrenocortical response following repetitive chemical immobilization (Engelhard et al. 2002). With respect to anthropogenic sound as a stressor, the current limited body of knowledge will require extrapolation from species for which information exists to those for which no information exists.

The stress response may or may not result in a behavioral change, depending on the characteristics of the exposed animal. However, provided a stress response occurs, we assume that some contribution is made to the animal’s allostatic load. Allostasis is the ability of an animal to maintain stability through change by adjusting its physiology in response to both predictable and unpredictable events (McEwen and Wingfield 2003). The same hormones associated with the stress response vary naturally throughout an animal’s life, providing support for particular life history events (e.g., pregnancy) and predictable environmental conditions (e.g., seasonal changes). The allostatic load is the cumulative cost of allostasis incurred by an animal and is characterized with respect to an animal’s energetic expenditure.

Perturbations to an animal that may occur with the presence of a stressor, either biological (e.g., predator) or anthropogenic (e.g., construction), can contribute to the allostatic load (McEwen and Wingfield 2003). Additional costs are cumulative and additions to the allostatic load over time may contribute to reductions in the probability of achieving ultimate life history functions (e.g., survival, maturation, reproductive effort and success) by producing pathophysiological states. The contribution to the allostatic load from a stressor requires estimating the magnitude and duration of the stress response, as well as any secondary contributions that might result from a change in behavior.

If the acoustic source does not produce tissue effects, is not perceived by the animal, or does not produce a stress response by any other means, it is assumed that the exposure does not contribute to the allostatic load. Additionally, without a stress response or auditory masking, it is assumed that there can be no behavioral change. Conversely, any immediate effect of exposure that produces an injury is assumed to also produce a stress response and contribute to the allostatic load.

#### 3.9.2.2.2 Behavior

Acute stress responses may or may not cause a behavioral reaction. However, all changes in behavior are expected to result from an acute stress response. This expectation is based on the idea that some sort of physiological trigger must exist to change any behavior that is already being performed. The exception to this rule is the case of masking. The presence of a masking sound may not produce a stress response, but may interfere with the animal’s ability to detect and discriminate biologically relevant signals. The inability to detect and discriminate biologically relevant signals hinders the potential for normal behavioral responses to auditory cues and is considered a behavioral change. Numerous behavioral changes can occur as a result of stress response and, for each potential behavioral change, the magnitude in the change and the severity of the response needs to be estimated. Certain conditions, such as stampeding (i.e., flight response) or a response to a predator, might have a probability of resulting in injury. For example, a flight response, if significant enough, could produce a stranding event. Under the MMPA, such an event would be considered a MMPA Level A harassment. Each altered behavior may also have the potential to disrupt biologically significant events (e.g., breeding or nursing) and may need to be qualified as MMPA Level B harassment. Exposures to sonar resulting in non-TTS behavioral disturbance and exposure to at-sea explosions resulting in sub-TTS behavioral disturbance are quantified as MMPA Level B harassment. All behavioral disruptions have the potential to contribute to the allostatic load. This secondary potential is signified by the feedback from the collective behaviors to allostatic loading (physiology block). The response of a marine mammal to an anthropogenic sound source will depend on the frequency content, duration, temporal pattern and amplitude of the sound as well as the animal’s prior experience with the sound and the context in which the sound is encountered (i.e., what the animal is doing at the time of the exposure). The direction of the responses can vary, with some changes resulting in either increases or decreases from baseline (e.g., decreased dive times and increased respiration rate). Responses can also overlap; for example, an increased respiration rate is likely to be coupled to a flight response. Differential responses between and within species are expected since hearing ranges vary across species and the behavioral ecology of individual species is unlikely to completely overlap. A review of marine mammal responses to anthropogenic sound was first conducted by Richardson and others in 1995. A more recent review (Nowacek et al. 2007) addresses studies conducted since 1995 and focuses on observations where the received sound level of the exposed marine mammal(s) was known or could be estimated. The following sections provide a very brief overview of the state of knowledge of behavioral responses. The overviews focus on studies conducted since 2000 but are not meant to be comprehensive; rather, they provide an idea of the variability in behavioral responses that would be expected given the differential sensitivities of marine mammal species to sound and the wide range of potential acoustic sources to which a marine mammal may be exposed. Estimates of the types of behavioral responses that could occur for a given sound exposure should be determined from the literature that is available for each species, or extrapolated from closely related species when no information exists.

### Flight Response

A flight response is a dramatic change in normal movement to a directed and rapid movement away from the perceived location of a sound source. Little information on flight responses of marine mammals to anthropogenic signals exists, although observations of flight responses to the presence of predators have occurred (Connor and Heithaus 1996). Flight responses have been speculated as being a component of marine mammal strandings associated with sonar activities (NOAA 2001).

### Response to Predators

Evidence suggests that at least some marine mammals have the ability to acoustically identify potential predators. For example, harbor seals that reside in the coastal waters off British Columbia are frequently targeted by certain groups of killer whales, but not others. The seals discriminate between the calls of threatening and non-threatening killer whales (Deecke et al. 2002), a capability that should increase survivorship while reducing the energy required for attending to and responding to all killer whale calls. The occurrence of masking or hearing impairment provides a means by which marine mammals may be prevented from responding to the acoustic cues produced by their predators. Whether or not this is a possibility depends on the duration of the masking/hearing impairment and the likelihood of encountering a predator during the time that predator cues are impeded.

### Diving

Changes in dive behavior can vary widely. They may consist of increased or decreased dive times and surface intervals as well as changes in the rates of ascent and descent during a dive. Variations in dive behavior may reflect interruptions in biologically significant activities (e.g., foraging) or they may be of little biological significance. Variations in dive behavior may also expose an animal to potentially harmful conditions (e.g., increasing the chance of ship-strike) or may serve as an avoidance response that enhances survivorship. The impact of a variation in diving resulting from an acoustic exposure depends on what the animal is doing at the time of the exposure and the type and magnitude of the response. Nowacek et al. (2004) reported disruptions of dive behaviors in foraging North Atlantic right whales when exposed to an alerting stimulus, an action, they noted, that could lead to an increased likelihood of ship strike. However, the whales did not respond to playbacks of either right whale social sounds or vessel noise, highlighting the importance of the sound characteristics in producing a behavioral reaction. Conversely, Indo-Pacific humpback dolphins have been observed to dive for longer periods of time in areas where vessels were present and/or approaching (Ng and Leung 2003). In both of these studies, the influence of the sound exposure cannot be decoupled from the physical presence of a surface vessel; thus, complicating interpretations of the relative contribution of each stimulus to the response. Indeed, the presence of surface vessels, their approach and speed of approach, seemed to be significant factors in the response of the Indo-Pacific humpback dolphins (Ng and Leung 2003). Low frequency signals of the Acoustic Thermometry of Ocean Climate (ATOC) sound source were not found to affect dive times of humpback whales in Hawaiian waters (Frankel and Clark 2000) or to overtly affect elephant seal dives (Costa et al. 2003). However, they did produce subtle effects that varied in direction and degree among the individual seals, illustrating the equivocal nature of behavioral effects and consequent difficulty in defining and predicting them. Due to past incidents of beaked whale strandings associated with sonar operations, feedback paths are provided between avoidance and diving and indirect tissue effects. This feedback accounts for the hypothesis that variations in diving behavior and/or avoidance responses can possibly result in nitrogen tissue supersaturation and nitrogen off-gassing, possibly to the point of deleterious vascular bubble formation (Jepson et al. 2003). Although hypothetical, the potential process is being debated within the scientific community.

### Foraging

Disruption of feeding behavior can be difficult to correlate with anthropogenic sound exposure, so it is usually inferred by observed displacement from known foraging areas, the appearance of secondary indicators (e.g., bubble nets or sediment plumes), or changes in dive behavior. Noise from seismic surveys was not found to impact the feeding behavior in western gray whales off the coast of Russia (Yazvenko et al. 2007) and sperm whales engaged in foraging dives did not abandon dives when exposed to distant signatures of seismic airguns (Madsen et al. 2006). Balaenopterid whales exposed to moderate low-frequency signals similar to the ATOC sound source demonstrated no variation in foraging activity.

### Vocalizations

Vocal changes in response to anthropogenic noise can occur across the repertoire of sound production modes used by marine mammals, such as whistling, echolocation click production, calling, and singing. Changes may result in response to a need to compete with an increase in background noise or may reflect an increased vigilance or startle response. For example, in the presence of low-frequency active sonar, humpback whales have been observed to increase the length of their ”songs” (Miller et al. 2000, Fristrup et al. 2003), possibly due to the overlap in frequencies between the whale song and the low-frequency active sonar. A similar compensatory effect for the presence of low frequency vessel noise has been suggested for right whales; right whales have been observed to shift the frequency content of their calls upward while reducing the rate of calling in areas of increased anthropogenic noise (Parks et al. 2007). Killer whales off the northwestern coast of the United States have been observed to increase the duration of primary calls once a threshold in observing vessel density (e.g., whale watching) was reached, which has been suggested as a response to increased masking noise produced by the vessels (Foote et al. 2004). In contrast, both sperm and pilot whales potentially ceased sound production during the Heard Island feasibility test (Bowles et al. 1994), although it cannot be absolutely determined whether the inability to acoustically detect the animals was due to the cessation of sound production or the displacement of animals from the area.

### Avoidance

Avoidance is the displacement of an individual from an area as a result of the presence of a sound. It is qualitatively different from the flight response in its magnitude (i.e., directed movement, rate of travel, (Croll et al. 2001), whereas five out of six North Atlantic right whales exposed to an acoustic alarm interrupted their foraging dives (Nowacek et al. 2004). Although the received sound pressure level at the animals was similar in the latter two studies, the frequency, duration, and temporal pattern of signal presentation were different. These factors, as well as differences in species sensitivity, are likely contributing factors to the differential response. A determination of whether foraging disruptions incur fitness consequences will require information on or estimates of the energetic requirements of the individuals and the relationship between prey availability, foraging effort and success, and the life history stage of the animal.

### Breathing

Variations in respiration naturally vary with different behaviors and variations in respiration rate as a function of acoustic exposure can be expected to co-occur with other behavioral reactions, such as a flight response or an alteration in diving. However, respiration rates in and of themselves may be representative of annoyance or an acute stress response. Mean exhalation rates of gray whales at rest and while diving were found to be unaffected by seismic surveys conducted adjacent to the whale feeding grounds (Gailey et al., 2007). Studies with captive harbor porpoises showed increased respiration rates upon introduction of acoustic alarms (Kastelein et al. 2000, Kastelein et al. 2006) and emissions for underwater data transmission (Kastelein et al. 2005). However, exposure of the same acoustic alarm to a striped dolphin under the same conditions did not elicit a response (Kastelein et al. 2006), again highlighting the importance in understanding species differences in the tolerance of underwater noise when determining the potential for impacts resulting from anthropogenic sound exposure.

### Social Relationships

Social interactions between mammals can be affected by noise via the disruption of communication signals or by the displacement of individuals. Disruption of social relationships depends on the disruption of other behaviors (e.g., caused avoidance, masking, etc.) and no specific overview is provided here. However, social disruptions must be considered in context of the relationships that are affected. etc.). Oftentimes avoidance is temporary, and animals return to the area once the noise has ceased. However, longer term displacement is possible, which can lead to changes in abundance or distribution patterns of the species in the affected region if they do not become acclimated to the presence of the sound (Blackwell et al. 2004, Bejder et al. 2006, Teilmann et al. 2006). Acute avoidance responses have been observed in captive porpoises and pinnipeds exposed to a number of different sound sources (Kastelein et al. 2000, Finneran et al. 2003, Kastelein et al. 2006). Short term avoidance of seismic surveys, low frequency emissions, and acoustic deterrents has also been noted in wild populations of odontocetes (Bowles et al. 1994, Goold 1996, Stone et al. 2000, Morton and Symonds 2002) and to some extent in mysticetes (Gailey et al. 2007), while longer term or repetitive/chronic displacement for some dolphin groups and for manatees has been suggested to be due to the presence of chronic vessel noise (Haviland-Howell et al. 2007, Miksis-Olds et al. 2007).

### Orientation

A shift in an animal’s resting state or an intentional change via an orienting response represent behaviors that would be considered mild disruptions if occurring alone, and are placed at the bottom of the framework behavior list. As previously mentioned, the responses may co-occur with other behaviors; for instance, an animal may initially orient toward a sound source, and then move away from it. Thus, any orienting response should be considered in context of other reactions that may occur.

### Proximate Life Functions

Proximate life history functions are the functions that the animal is engaged in at the time of acoustic exposure. The disruption of these functions, and the magnitude of the disruption, is something that must be considered in determining how the ultimate life history functions are affected. Consideration of the magnitude of the effect to each of the proximate life history functions is dependent upon the life stage of the animal. For example, an animal on a breeding ground which is sexually immature will suffer little consequence to disruption of breeding behavior when compared to an actively displaying adult of prime reproductive age.

### Ultimate Life Functions

The ultimate life functions are those that enable an animal to contribute to the population (or stock, or species, etc.). The impact to ultimate life functions will depend on the nature and magnitude of the perturbation to proximate life history functions. Depending on the severity of the response to the stressor, acute perturbations may have nominal to profound impacts on ultimate life functions. For example, underwater detonations in an area that is utilized for foraging, but not for breeding, may disrupt feeding by exposed animals for a brief period of time. Because of the brevity of the perturbation, the impact to ultimate life functions may be negligible. By contrast, weekly training over a period of years may have a more substantial impact because the stressor is chronic. Assessment of the magnitude of the stress response from the chronic perturbation would require an understanding of how and whether animals acclimate to a specific, repeated stressor and whether chronic elevations in the stress response (e.g., cortisol levels) produce fitness deficits. The proximate life functions are loosely ordered in decreasing severity of impact. Mortality (survival) has an immediate effect, in that no future reproductive success is feasible and there is no further addition to the population resulting from reproduction. Severe injuries may also lead to reduced survivorship (longevity) and prolonged alterations in behavior. The latter may further affect an animal's overall reproductive success and reproductive effort. Disruptions of breeding have an immediate impact on reproductive effort and may impact reproductive success. The magnitude of the effect will depend on the duration of the disruption and the type of behavior change that was provoked. Disruptions to feeding and migration can affect all of the ultimate life functions; however, the impacts to reproductive effort and success are not likely to be as severe or immediate as those incurred by mortality and breeding disruptions. Taking into account these considerations, it was determined if there were population and species effects.

#### 3.9.2.2.3 Integration of Physiological and Behavioral Effects

This section presents a biological framework within which potential effects can be categorized and then related to the existing regulatory framework of injury (MMPA Level A harassment) and behavioral disruption (MMPA Level B harassment). The information presented in the previous sections is used to develop specific numerical exposure thresholds and risk function exposure estimations. Exposure thresholds are combined with underwater detonation and sound propagation models and species distribution data to estimate the potential exposures.

Sound exposure may affect multiple biological traits of a marine animal; however, existing protective regulations (i.e., MMPA) provide guidance as to which traits should be used when determining impacts. Specifically, impacts that qualify as Level A harassment should address injury and impacts that qualify as Level B harassment should address behavioral disruption. This guidance reduces the number of traits that must be considered in establishing a biological framework of impact assessment.

The biological framework discussed in the SSTC EIS is structured according to physiological and behavioral effects resulting from exposure to acoustics and pressure. The range of effects may then be assessed to determine which qualify as harassment under MMPA regulations. Physiology and behavior are chosen over other biological traits for several reasons, including the fact that: (1) they are consistent with regulatory statements defining harassment; (2) they are components of other biological traits that may be relevant; and (3) they are a more sensitive and immediate indicator of effect. For example, ecology is not used as the basis of the framework because the ecology of an animal is dependent upon the interaction of an animal with the environment. The animal's interaction with the environment is driven both by its physiological function and its behavior, and an ecological impact may not be observable over short periods of observation. Anatomy is not used because disruption of an animal's anatomy would necessarily result in a change in physiological function.

A "physiological effect" is defined within the context of this EIS as one in which the normal physiological function of the animal is altered in response to sound or underwater detonation exposure. Physiological function is any of a collection of processes ranging from biochemical reactions to mechanical interaction and operation of organs and tissues within an animal. A physiological effect may range from the most significant of impacts (e.g., mortality, serious injury) to lesser impacts that would define the lower end of the physiological impact range (e.g., non-injurious distortion of auditory tissues). This latter physiological effect is important to the integration of the biological and regulatory frameworks and is described in later sections.

A "behavioral effect" is one in which the normal behavior of an animal, or patterns of behavior, are overtly disrupted in response to an exposure. Examples of behaviors of concern can be derived from the harassment definitions of the MMPA.

In this EIS, the term "normal" is used to qualify distinctions between physiological and behavioral effects. Its use follows the convention of normal daily variation in physiological and behavioral function without the influence of anthropogenic acoustic sources. As a result, this EIS uses the following definitions:

- A physiological effect is a variation in an animal's physiology that results from an anthropogenic sound exposure and exceeds the normal daily variation in physiological function.
- A behavioral effect is a variation in an animal's behavior or behavior patterns that results from an anthropogenic sound exposure and exceeds the normal daily variation in behavior, but which arises through normal physiological process (it occurs without an accompanying physiological effect).

The definitions of "physiological effect" and "behavioral effect" used here are specific to this EIS and should not be confused with more global definitions applied to the field of biology.

It is reasonable to expect some physiological effects to result in subsequent behavioral effects. For example, a marine mammal that suffers a severe injury may be expected to alter diving or foraging such that variation in these behaviors is outside that which is considered normal for the species. If a physiological effect is accompanied by a behavioral effect, the overall effect is characterized as a physiological effect; physiological effects take precedence over behavioral effects with regard to their ordering. This approach provides the most conservative evaluation of effects with respect to severity, provides a rational approach to dealing with the overlap of the definitions, and avoids circular arguments.

The severity of physiological effects decreases with decreasing exposure (acoustic or blast-wave) and/or increasing distance from the sound source. The same generalization does not consistently hold for behavioral effects because they do not depend solely on received sound levels. Behavioral responses also depend on an animal's learned responses, innate response tendencies, motivational state, the pattern of the sound exposure, and the context in which sounds are presented. However, to provide a tractable approach to predicting acoustic impacts that is relevant to the terms of behavioral disruption described in the MMPA; it is assumed herein that the severity of behavioral effects also decreases with decreasing sound exposure and/or increasing distance from the sound source. Figure 3.9-1 shows the relationships between severity of effects, source distance, and sound exposure as defined in this EIS.

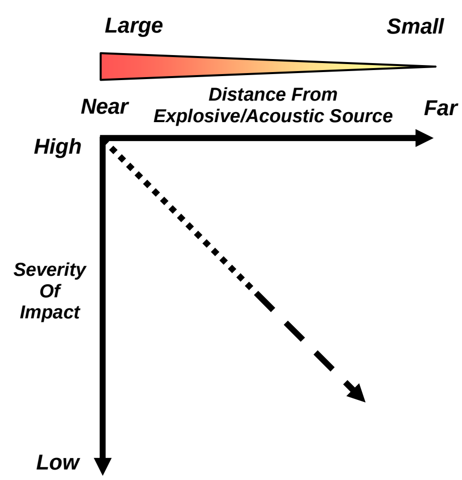



**Figure 3.9-1: Relationship between Severity of Effects, Source Distance, and Exposure Level**

#### 3.9.2.2.4 Level A and Level B Harassment

Categorizing potential effects as either physiological or behavioral effects allows them to be related to the harassment definitions. For military readiness activities, MMPA Level A harassment includes any act that injures or has the significant potential to injure a marine mammal or marine mammal stock in the wild. Injury, as defined in this LOA request and previous rulings (NOAA 2001, 2002a, 2008b, 2008c), is the destruction or loss of biological tissue from a species. The destruction or loss of biological tissue will result in an alteration of physiological function that exceeds the normal daily physiological variation of the intact tissue. For example, increased localized histamine production, edema, production of scar tissue, activation of clotting factors, white blood cell response, etc., may be expected following injury.

Therefore, this EIS assumes that all injury is qualified as a physiological effect and, to be consistent with prior actions and rulings (NOAA 2001, 2008b, 2008c), all injuries (slight to severe) are considered MMPA Level A harassment. Public Law 108-136 (2004) amended the MMPA definitions of Level B harassment for military readiness activities, which applies to this action. For military readiness activities, MMPA Level B harassment is defined as “any act that disturbs or is likely to disturb a marine mammal or marine mammal stock by causing disruption of natural behavioral patterns including, but not limited to, migration, surfacing, nursing, breeding, feeding, or sheltering to a point where such behaviors are abandoned or significantly altered.” Unlike MMPA Level A harassment, which is solely associated with physiological effects, both physiological and behavioral effects may cause MMPA Level B harassment.

For example, some physiological effects (such as TTS) can occur that are non-injurious but that can potentially disrupt the behavior of a marine mammal. These include temporary distortions in sensory tissue that alter physiological function, but that are fully recoverable without the requirement for tissue replacement or regeneration. For example, an animal that experiences a temporary reduction in hearing sensitivity suffers no injury to its auditory system, but may not perceive some sounds due to the reduction in sensitivity. As a result, the animal may not respond to sounds that would normally produce a behavioral reaction. This lack of response qualifies as a temporary disruption of normal behavioral patterns—the animal is impeded from responding in a normal manner to an acoustic stimulus. The harassment status of slight behavior disruption has been addressed in workshops, previous actions, and rulings (NOAA 2001, 2008b, 2008c; DoN 2001a). The conclusion is that a momentary behavioral reaction of an animal to a brief, time-isolated acoustic event does not qualify as MMPA Level B harassment. A more general conclusion, that MMPA Level B harassment occurs only when there is “a potential for a significant behavioral change or response in a biologically important behavior or activity,” is found in recent rulings (NOAA 2002a, 2008b, 2008c). Public Law 108-136 (2004) amended the definition of MMPA Level B harassment for military readiness activities, which applies to this action. For military readiness activities, MMPA Level B harassment is defined as “any act that disturbs or is likely to disturb a marine mammal or marine mammal stock by causing disruption of natural behavioral patterns…to a point where such behaviors are abandoned or significantly altered.”

Although the temporary lack of response discussed above may not result in abandonment or significant alteration of natural behavioral patterns, the acoustic effect inputs used in the acoustic model assume that temporary hearing impairment (slight to severe) is considered MMPA Level B harassment. Although modes of action are appropriately considered, the conservative assumption used here is to consider all hearing impairment as harassment from TTS. As a result, the actual incidental harassment of marine mammals associated with this action may be less than predicted via the analytical framework.

To assess the potential for harassment, two quantities are of interest:

- The number of animals with probability of being present in the zone of influence (ZOI) for injury but not detected.
- The expected number of marine mammals within various radii of the detonation point (i.e., ZOI ranges for mortality, injury, and behavioral disruption) is included in the considerations. This quantity is ordinarily referred to as "incidental take."

For this EIS, estimates of the numbers of species within the harassment zones and exposed to the various sound sources were calculated assuming that none of the current mitigation measures routinely used for SSTC activities were implemented. Harassment that may result from Navy activities described in this EIS is unintentional and incidental to those activities.

#### 3.9.2.2.5 Harassment Zones

The volumes of ocean in which Level A and B harassment are predicted to occur are described as harassment zones. All animals predicted to be in a zone are considered "exposed" within the applicable harassment category.

The Level A harassment zone extends from the source out to the distance and exposure where slight injury is predicted to occur. The acoustic exposure that produces slight injury is the threshold value defining the outermost limit of the Level A harassment zone. A dual criterion approach promulgated by NMFS rulemaking was used to determine potential impact ranges for Level A (see Section 3.9.2.3). Criterion included 100 percent mortality, which could occur from either maximum shock wave pressure or bulk cavitation, and slight injury. Slight injury included onset gastro-intestinal tract injury, which could occur from maximum shock wave pressure, and onset permanent threshold shift (PTS) which could occur from either maximum shock wave pressure or weighted energy flux density. Use of the threshold associated with the onset of slight injury (onset PTS) as the most distant point and least injurious exposures account of all more serious injuries by inclusion within the Level A harassment zone.

The Level B harassment zone begins just beyond the point of slightest injury and extends outward from that point. It includes all animals that may potentially experience Level B harassment. Physiological effects extend beyond the range of slightest injury to a point where slight temporary distortion of the most sensitive tissue occurs, but without destruction or loss of that tissue. The animals predicted to be in this zone experience Level B harassment by virtue of temporary impairment of sensory function (i.e., altered physiological function) that can disrupt behavior. Beyond that distance, the Level B harassment zone continues to the point at which no biologically significant behavioral disruption is expected to occur. Onset of temporary impact criterion included onset TTS which could occur from either maximum shock wave pressure or weighted energy flux density.

#### 3.9.2.2.6 Auditory Tissues as Indicators of Physiological Effects

The mammalian auditory system consists of the outer ear, middle ear, inner ear, and central nervous system. Sound waves are transmitted through the outer and middle ears to fluids within the inner ear. The inner ear contains delicate electromechanical hair cells that convert the fluid motions into neural impulses that are sent to the brain. The hair cells within the inner ear are the most vulnerable to overstimulation by noise exposure (Yost 1994). Very high sound levels may rupture the eardrum or damage the small bones in the middle ear (Yost 1994). Lower level exposures may cause permanent or temporary hearing loss—called a noise-induced threshold shift or simply threshold shift (TS) (Miller 1974; Ward 1997). A TS may be permanent, called a permanent threshold shift (PTS), or temporary, called a TTS. Still lower exposures may result in auditory masking interfering with an animal's ability to hear other concurrent sounds.

A TTS is a result of auditory system fatigue following stimulation. The fatigue is believed to be caused by temporary changes in neural function, hair-cell function, and reductions in oxygen availability within the inner ear fluids. Collectively, these qualify as physiological changes that would exceed the normal daily variation in physiological function specific to those components of the auditory system. A PTS results from injury, which may occur at multiple levels of the auditory system. Tissue destruction can produce both localized and distributed variations in physiology depending on the type, location, and magnitude of the injury. With respect to auditory tissues, destruction of tissues associated with PTS would, at a minimum, result in localized changes in the physiology of the tissue that exceeds its normal daily variation in physiological function. Therefore, both TTS and PTS are physiological effects.

The amount of TS depends on the amplitude, duration, frequency, and temporal pattern of the sound exposure. Threshold shifts increase with the amplitude and duration of sound exposure. For continuous sounds, exposures of equal energy would lead to approximately equal effects (Ward 1997). For intermittent sounds, less TS occurs from continuous exposure with the same energy; further, some recovery occurs between exposures (Kryter et al. 1966, Ward 1997). The relationships between sound exposure parameters and resulting TS are not well understood for impulsive sounds. The TSs from impulsive sounds are more difficult to characterize than TSs from continuous-type sounds, in part because of the wide variety of impulsive sound waveforms that may be encountered (Hamernik et al. 1991).

The magnitude of TS normally decreases with the amount of time post-exposure (Miller, 1974). The amount of TS just after exposure is called the initial TS. If the TS eventually returns to zero (i.e., the threshold returns to the pre-exposure value), the TS is a TTS. Because the amount of TTS depends on the time post-exposure, it is common to use a subscript to indicate the time in minutes after exposure (Quaranta et al. 1998). For example, $TTS_2$ means a TTS measured two minutes after exposure. If the TS does not return to zero but leaves some finite amount of TS, that remaining TS is a PTS. The distinction between PTS and TTS is based on whether there is a complete recovery of TS following a sound exposure.

#### 3.9.2.2.7 Mortality and the Level A Harassment Zone

Within the Level A harassment zone is a sub-region in which animals exposed to the blast are not expected to survive. Marine mammals can be killed by underwater explosions due to the response of air cavities, such as the lungs and bubbles in the intestines, to the shock wave (Elsayed 1997, Elsayed and Gorbunov 2007). The criterion for mortality used in this EIS is the onset of extensive lung hemorrhage. Extensive lung hemorrhage is considered debilitating and potentially fatal as a result of air embolism or suffocation. In this EIS, all marine mammals within the calculated radius for onset of extensive lung injury (i.e., onset of mortality) are counted as lethal exposures. The range at which onset of extensive lung hemorrhage is expected to occur is greater than the ranges at which 50 to 100 percent lethality would occur from closest proximity to the charge or from presence within the bulk cavitation region. (The region of bulk cavitation is an area near the surface above the detonation point in which the reflected shock wave creates a region of cavitation within which smaller animals would not be expected to survive.) Because the range for onset of extensive lung hemorrhage for smaller animals exceeds the range for bulk cavitation and all more serious injuries, all smaller animals within the region of cavitation and all animals (regardless of body mass) with more serious injuries than onset of extensive lung hemorrhage are accounted for in the lethal exposures estimate. The calculated maximum ranges for onset of extensive lung hemorrhage depend upon animal body mass, with smaller animals having the greatest potential for impact, as well as water column temperature and density.

#### 3.9.2.2.8 Injury and the Level A Harassment Zone

The remainder of the Level A harassment zone, which extends beyond the sub-region defining lethal exposures, encompasses all remaining non-lethal injuries that could potentially occur to marine mammals as a result of blast exposure. The criteria used to define the outer edge of the Level A harassment zone is the range at which PTS begins to occur (onset PTS). The auditory system consists of delicate tissues (e.g., hair cells) that are sensitive to pressure changes and responsive to sound exposures that are well below levels likely to cause trauma to non-auditory, air containing structures. PTS is non-recoverable and must result from the destruction of tissues within the auditory system (e.g., tympanic membrane rupture, disarticulation of the middle ear ossicles, and hair-cell damage).

Therefore, PTS qualifies as an injury and is classified as Level A harassment under the wording of the MMPA.

Onset PTS is indicative of the minimum level of injury that can occur due to sound exposure. All other forms of trauma would occur closer to the sound source than the range at which onset PTS occurs.

#### 3.9.2.2.9 TTS and the Level B Harassment Zone

The Level A harassment zone extends from the detonation point outward to that point where the slightest injury may occur. Therefore, the Level B harassment zone begins just beyond the point at which the slightest amount of injury occurs and extends outward to the distance and exposure where the onset of TTS is expected to occur. Consistent with previous NMFS rulings, single, time-isolated impulsive events such as that described in this EIS are considered incapable of causing significant behavioral disruption at levels below those causing TTS. Because of the transient nature of the sources used in this action, the limited number of detonations, and temporal spacing of detonations, no significant behavioral effects that qualify as Level B harassment would occur in this action (NMFS 2009a, 2009b). As a result, only physiological effects need be considered in the development of harassment criteria. The Level B harassment zone only includes the region in which TTS is predicted to occur. TTS is recoverable and, as in recent rules (NMFS 2009a, 2009b), is considered to result from the temporary, non-injurious distortion of hearing-related tissues. In this EIS, the smallest measurable amount of TTS (onset TTS) is taken as the best indicator for slight temporary sensory impairment. The acoustic exposure associated with onset TTS is used to define the outer limit of the portion of the Level B harassment zone attributable to physiological effects. This follows from the concept that hearing loss potentially affects a marine mammal's ability to react normally to the sounds around it; it potentially disrupts normal behavior by preventing it from occurring. Therefore, the potential for TTS qualifies as a Level B harassment that is mediated by physiological effects upon the auditory system.

#### 3.9.2.2.10 Level B Behavioral Effects

This EIS defines behavioral effects as variations in an animal's behavior that exceed the normal daily variation in behavior, do not meet the definition of a physiological effect, and which follow an anthropogenic sound exposure. Level B harassment includes only those acts which disturb or are likely to disturb by causing disruption of behavioral patterns to the point where those patterns are abandoned or significantly altered. Previous actions and rules (NMFS 2009a, 2009b, DoN 2008a, DoN 2008b) have concluded that a momentary behavioral reaction of an animal to a brief, time-isolated acoustic event does not qualify as Level B harassment. That Level B harassment occurs only when there is "a potential for a significant behavioral change or response in a biologically important behavior or activity". This conclusion is further supported by the National Defense Authorization Act of 2004 (Public Law [PL] 108-136) for actions involving military readiness, as defined in Section 11.

The short-duration events proposed for this action are brief and time-isolated. In this EIS and consistent with prior rules (e.g., NMFS 2009a, 2009b), they are considered incapable of causing behavioral effects beyond slight, momentary disruption and are unlikely to have any significant biological impact upon exposed animals. Furthermore, the transient nature of impulsive sources proposed for this action, the limited number of detonations required for the completion of the action, the temporal spacing of detonations (on the order of days), and the dynamic and patchy nature of offshore animal distributions makes it unlikely that any animal would be exposed to more than one acoustic event. These conclusions are considered as limiting factors in the development of harassment zones for this proposed action.

#### 3.9.2.2.11 Auditory Masking

Natural and artificial sounds can disrupt behavior by masking, or interfering with an animal's ability to hear other sounds. Masking occurs when the receipt of a sound is interfered with by another coincident sound at similar frequencies and at similar or higher levels. If the second sound were man-made, it could be potentially harassing—according to the MMPA—if it disrupted hearing-related behavior such as communications or echolocation. It is important to distinguish TTS and PTS, which persist after the sound exposure, from masking, which occurs during the sound exposure. Because masking (without a resulting TS) is not associated with abnormal physiological function, it is not considered a physiological effect in this EIS, but rather a potential behavioral effect.

The most intense underwater sounds in the proposed action are those produced by detonations and pile driving. Given that the energy distribution of detonations and pile driving cover a broad frequency spectrum, sound from these sources would likely be within the audible range of most marine mammals. However, the time scale of the shots is very limited; the pulse lengths are short, the repetitions of the shots are few, and the total time per year during which detonations occur is small. The probability for any detonation or pile driving resulting from this proposed action masking acoustic signals important to the behavior and survival of marine mammal species is negligible. Additionally, for reasons outlined above, any masking event that did occur would be considered transient and insignificant and would not qualify as Level B harassment. Masking effects are not considered as contributing to exposure estimates in this EIS.

### 3.9.2.3 Criteria for Assessing Marine Mammal Response to Underwater Detonations

The effects of an at-sea explosion on a marine mammal depends on many factors, including the size, type, and depth of both the animal and the explosive charge; the depth of the water column; the standoff distance between the charge and the animal; and the sound propagation properties of the environment. Potential impacts can range from brief acoustic effects (such as behavioral disturbance), tactile perception, physical discomfort, slight injury of the internal organs and the auditory system, to death of the animal (Yelverton et al. 1973, O'Keeffe and Young 1984, DoN 2001). Non-lethal injury includes slight injury to internal organs and the auditory system; however, delayed lethality can be a result of individual or cumulative sublethal injuries (DoN 2001a). Short-term or immediate lethal injury would result from massive combined trauma to internal organs as a direct result of proximity to the point of detonation (DoN 2001a).

In this EIS, several standard acoustic metrics (Urick 1983) are used to describe the thresholds for predicting potential physical impacts from underwater pressure waves:

- Total energy flux density or Sound Exposure Level (SEL). For plane waves (as assumed here), SEL is the time integral of the instantaneous intensity, where the instantaneous intensity is defined as the squared pressure divided by the impedance of sea water. Thus, SEL is the instantaneous pressure amplitude squared, summed over the duration of the signal and has dB units referenced to 1 micropascal squared second ($\mu Pa^2$-s).
- 1/3-octave SEL. This is the SEL in a 1/3-octave frequency band. A 1/3-octave band has upper and lower frequency limits with a ratio of 21:3, creating bandwidth limits of about 23 percent of center frequency.

- Positive impulse. This is the time integral of the initial positive pressure pulse of an explosion or explosive-like wave form. Standard units are Pascal seconds (Pa-sec), but pounds per square inch milliseconds (psi-ms) also are used.
- Peak pressure. This is the maximum positive amplitude of a pressure wave, dependent on charge mass and range. Units used here are psi, but other units of pressure, such as μPa and Bar, also are used.

This section summarizes the marine mammal impact criteria, thresholds, and ranges used for the subsequent modeled calculations:

- Criterion. Specific impact that could be used to represent a broad type of impacts (mortality, injury, harassment). For example, onset of severe lung injury (extensive lung hemorrhage) is used in this EIS as a criterion for the onset of mortality.
- Threshold. The specific level of sound pressure, impulse, or energy needed to cause the specific impact stated in a criterion.
- Range. The maximum horizontal distance from the detonation point where the threshold level is predicted to occur.

To assess the effects of underwater explosions at SSTC, two types of criteria are necessary, those for mortality injury (i.e. Level A harassment) and those for non-injurious physiological and/or behavioral disruption (i.e. Level B harassment). The SSTC criteria are based on those numeric criteria as specified by NMFS in recent NMFS rule making (NMFS 2009a, 2009b), which involved a single, underwater detonations isolated in time. These criteria are presented in Table 3.9-2.

#### 3.9.2.3.1 Harassment Threshold for Sequential Detonations

There may be rare occasions when sequential underwater detonations are part of a static location event. For sequential detonations, accumulated energy over the entire training time is the natural extension for energy thresholds since energy accumulates with each subsequent shot.

For sequential detonations, the acoustic criterion for behavioral harassment is used to account for behavioral effects significant enough to be judged as harassment, but occurring at lower sound energy levels than those that may cause TTS. The behavioral harassment threshold is based on recent rulemaking from NMFS (NMFS 2009a, 2009b) for the energy-based TTS threshold.

The research on pure tone exposures reported in Schlundt et al. (2000) and Finneran and Schlundt (2004) provided the pure-tone threshold of 192 dB as the lowest TTS value. This value is modified for explosives by (a) interpreting it as an energy metric, (b) reducing it by 10 dB to account for the time constant of the mammal ear, and (c) measuring the energy in 1/3 octave bands, the natural filter band of the ear. The resulting TTS threshold for explosives is 182 dB re 1 mPa$^2$-s in any 1/3 octave band. As reported by Schlundt et al. (2000) and Finneran and Schlundt (2004), instances of altered behavior in the pure tone research began 5 dB lower than those causing TTS. The behavioral harassment threshold is derived by subtracting 5 dB from the 182 dB re 1 mPa$^2$-s in any 1/3 octave band threshold, resulting in a 177 dB re 1 μPa$^2$-s behavioral disturbance harassment threshold for multiple successive explosives.

**Table 3.9-2: Marine Mammal Effects Criteria For Underwater Detonations From Explosives < 2,000 lbs Net Explosive Weight**

| | Criterion | Criterion Definition | Threshold | Comments |
|---|---|---|---|---|
| Mortality | **Mortality**<br>Onset of extensive lung injury | **Shock Wave**<br>Goertner's modified positive impulse, indexed to the surface | I = 42.9 (M/34)1/3 psi-msec<br>*calculated to be*<br>30.5 psi-msec | For all size classes of marine mammals |
| Level A Harassment | **Slight Injury**<br>Onset of slight lung injury | **Shock Wave**<br>Goertner's modified positive impulse, indexed to the surface | I = 19.7 (M/42)1/3 psi-msec<br>*calculated to be*<br>13 psi-msec | For all size classes of marine mammals |
| Level A Harassment | **Slight Injury**<br>50% tympanic membrane rupture | **Shock Wave**<br>Total SEL, for any single exposure | 205 dB re:1μPa$^2$-sec | All marine mammals |
| Level B Harassment | **Physiological Disruption**<br>TTS | **Sound Exposure**<br>Greatest SEL in any 1/3-octave band, over all exposures | 182 dB re1μPa$^2$-sec | Greatest SEL for frequencies ≥ 100 Hz for odontocetes and ≥ 10 Hz for mysticetes |
| Level B Harassment | **Physiological Disruption**<br>TTS | **Sound Exposure**<br>Peak pressure, for any single exposure | 23 psi | All marine mammals |
| Level B Harassment | **Behavioral Disruption**<br>Sub-TTS | **Sound Exposure**<br>Greatest SEL in any 1/3-octave band, over all exposures | 177 dB re:1μPa$^2$-sec | Greatest SEL for frequencies ≥ 100 Hz for odontocetes and ≥ 10 Hz for mysticetes |

### 3.9.2.4 Criteria for ELCAS pile driving and removal

Since 1997, NMFS has been using generic sound exposure thresholds to determine when an activity in the ocean that produces impact sound (i.e., pile driving) result in potential take of marine mammals by harassment (70 CFR 1871). NMFS is developing new science-based thresholds to improve and replace the current generic exposure level thresholds, but the criteria have not been finalized (Southall et al. 2007). Current NMFS criteria (70 FR 1871) regarding exposure of marine mammals to underwater impulsive sounds (e.g., impact pile driving) is that cetaceans exposed to sound levels of 180 dB root mean squared (RMS in units of dB re 1 μPa ) or higher and pinnipeds exposed to 190 dB RMS or higher are considered to have been taken by Level A (i.e., injurious) harassment. Marine mammals (cetaceans and pinnipeds) exposed to impulse sounds of 160 dB RMS but below injurious thresholds (i.e., 180 or 190 dB) are considered to have been taken by Level B behavioral harassment. Marine mammals (cetaceans and pinnipeds) exposed to continuous noise of 120 dB RMS (e.g., vibratory pile driving) or above are considered to have been taken by Level B behavioral harassment.

### 3.9.2.5 Acoustic Modeling of the Marine Environment

In context of ocean sounds within and adjacent to the SSTC, anticipated ocean noise can be characterized as two types of noises:

1. Ambient noise as a combination of natural noise from breaking waves, spray, bubble formation and collapse, molecular thermal agitation, rainfall, and biologics (fish sounds, snapping shrimp sounds,

marine mammal vocalizations, etc.), and often indistinct anthropogenic (human made) noise from passing vessels, small powered boats, aircraft overflights, etc.

2. Point source anthropogenic noise produced by a single, identifiable source usually close to the point of reference (e.g., an underwater explosion at SSTC, temporary pile driving).

#### 3.9.2.5.1 Multiple Indistinguishable Sources: Ambient Noise

More detailed discussions on ambient ocean noise are provided in Richardson et al. 1995, Deane 1997, 2000, NRC 2003, Hildebrand 2005 , Hildebrand 2009, which list specific case studies highlighting the sources and frequency content of natural and anthropogenic ocean noise sources. With the exception of sonar, many of these sources are applicable and contribute to ambient noise within the SSTC. Surf noise, biological noise, large vessel and small boat traffic, and aircraft overflights are likely to be the most dominant ambient noise sources within SSTC (Richardson et al. 1995, Deane 1997, Deane 2000, Hildebrand 2009).

Wenz (1962) provided a generalized portrait of ocean noise used to predict, model, and understand the noise level from unidentifiable sources. These curves provide a noise spectrum level (units are dB re 1μPa2/Hz) that an idealized receiver with omni-directional reception capabilities may experience at a particular moment depending on location. Although ambient noise is always present, the individual sources that contribute to it do not necessarily create sound continuously. For example, rain is periodic, and wind speeds change with weather patterns. Seasonal trends are likely related to changes in average wind speeds with season (McDonald et al. 2006). Given the nearshore distribution of the training areas within the SSTC, surf zone noise (breaking waves, etc.) is likely to be a constant ambient noise source. In the northern hemisphere, ambient noise in deep water can be dominated by shipping, particularly at frequencies between 5 and 500 Hz (Richardson et al. 1995, NRC 2003, Hildebrand 2009). By most estimates, there has been an increase of underwater noise associated with increased commercial shipping traffic, especially in areas near major ports. Several studies have documented an approximate equivalent 3 dB per decade increase in ocean noise attributed to commercial shipping (Hildebrand 2005, McDonald et al. 2006, Hildebrand 2009). In terms of logarithmic scaling used in sound measurements, this 3 dB increase is equivalent to a doubling of noise energy levels every 10 years over the last few decades.

Distant and localized shipping traffic approaching San Diego Bay can contribute to the general acoustic environment over a wide frequency range and large geographic area. However, it should be noted that shallow water noise levels from shipping traffic are highly variable primarily because of differences in local acoustic propagation and seafloor absorption characteristics in shallow water vice deep water (MacDonald et al. 2009). While the distribution and timing of shipping traffic is not uniform, this type of ambient ocean noise is prevalent in and around major ports including San Diego (Heitmeyer et al. 2004).

#### 3.9.2.5.2 Single Discrete Sources: Underwater Explosions

Underwater detonations produced during SSTC training events represent a single, known source. Chemical explosives create a bubble of expanding gases as the material burns. The bubble can oscillate underwater or, depending on charge-size and depth, be vented to the surface in which case there is no bubble-oscillation with its associated low-frequency energy. Explosions produce very brief, broadband pulses characterized by rapid rise-time, great zero-to-peak pressures, and intense sound, sometimes described as impulse. Close to the explosion, there is a very brief, great-pressure acoustic wave-front. The signal's rapid onset time, in addition to great peak pressure, can cause auditory impacts, although the brevity of the signal can include less SEL than expected to cause impacts. The transient signal gradually decays in magnitude as it broadens in duration with range from the source. The waveform transforms to approximate a low-frequency, broadband signal with a continuous sound energy distribution across the spectrum. In addition, underwater explosions are relatively brief, transitory events when compared to the existing ambient noise within San Diego Bay and at the SSTC. Ambient noise can be composed of natural sources such as wind, surf, and biological activity (e.g., snapping shrimp, fish calls, and marine mammal vocalizations), as well as generalized distance sound from human activities of which shipping is the dominant component (Richardson et al. 1995; NRC 2003, 2005).

The impacts of an underwater explosion to a marine mammal are dependent upon multiple factors including the size, type, and depth of both the animal and the explosive. Depth of the water column and the distance from the charge to the animal also are determining factors as are boundary conditions that influence reflections and refraction of energy radiated from the source. The severity of physiological effects generally decreases with decreasing exposure (impulse, sound exposure level, or peak pressure) and/or increasing distance from the sound source. The same generalization consistently is not applicable for behavioral effects, because they solely do not depend on sound exposure level. Behavioral responses also depend on an animal's learned responses, innate response tendencies, motivational state, pattern of the sound exposure, and context in which sounds are presented. Potential impacts can range from brief acoustic effects, tactile perception, and physical discomfort to both lethal and non-lethal injuries. Disturbance of ongoing behaviors could occur as a result of noninjurious physiological responses to both the acoustic signature and shock wave from the underwater explosion. Nonlethal injury includes slight injury to internal organs and auditory system. The severity of physiological effects generally decreases with decreasing sound exposure and/or increasing distance from the sound source. Injuries to internal organs and the auditory system from shock waves and intense impulsive noise associated with explosions can be exacerbated by strong bottom-reflected pressure pulses in reverberant environments (Gaspin 1983, Ahroon et al. 1996). The same generalization applies to behavioral effects, but is complicated by the fact that behavioral responses also depend on an animal's learned responses, innate response tendencies, motivational state, pattern of the sound exposure, and the context in which the sound is presented. While there are little data on the consequences of sound exposure from underwater detonations on behavioral or vital rates of marine mammals, exposure to sounds resulting from Navy underwater explosive training would be brief as each event is relatively discrete and separate in time and space from other similar events. In addition, the overall size of the explosives used at the SSTC is much smaller than those used during larger Fleet ship and aircraft training events.

#### 3.9.2.5.3 Predictive Modeling for Underwater Detonations – Modeling Framework

All underwater detonations proposed for SSTC were modeled as if they will be conducted in shallow water of 24 to 72 feet, including those that would normally be conducted in very shallow water (VSW) depths of zero to 24 feet. Modeling in deeper than actual water depths causes the modeled results to be more conservative (i.e., over prediction of propagation and potential exposures) than if the underwater detonations were modeled at their actual, representative depths when water depth is less than 24 feet. As will be discussed later, in deeper water there is less sound and energy propagation interference associated with the sea bottom and water surface.

The effects that underwater detonations have on a marine mammals is dependent upon multiple factors including size of the detonation, type of detonation, species of marine mammal, and depth of both the mammal and detonation. Depth of the water column and distance from the charge to the marine mammal also are determining factors. To quantify impacts, the U.S. Navy has developed simulations that determine exposures of protected species during training operations.

The Navy's underwater explosive effects simulation requires six major process components:

- A training event description including explosive type.
- Physical oceanographic and geoacoustic data for input into the acoustic propagation model representing seasonality of the planned operation.

- Biological data for the area including density (and multidimensional animal movement for those training events with multiple detonations).

- An acoustic propagation model suitable for the source type to predict impulse, energy, and peak pressure at ranges and depths from the source.

- The ability to collect acoustic and animal movement information to predict exposures for all animals during a training event (dosimeter record ).

- The ability for post-operation processing to evaluate the dosimeter exposure record and calculate exposure statistics for each species based on applicable thresholds.

An impact model, such as the one used for the SSTC analysis, simulates the conditions present based on location(s), source(s), and species parameters by using combinations of embedded models (Mitchell et al. 2008). The software package used for SSTC consists of two main parts: an underwater noise model and bioacoustic impact model (Lazauski et al. 1999, Lazauski and Mitchell 2006, Lazauski and Mitchell 2008).

Location-specific data characterize the physical and biological environments while exercise-specific data construct the training operations. The quantification process involves employment of modeling tools that yield numbers of exposures for each training operation. During modeling, the exposures are logged in a time-step manner by virtual dosimeters linked to each simulated animal. After the operation simulation, the logs are compared to exposure thresholds to produce raw exposure statistics. It is important to note that dosimeters only were used to determine exposures based on energy thresholds, not impulse or peak pressure thresholds. The analysis process uses quantitative methods and identifies immediate short-term impacts of the explosions based on assumptions inherent in modeling processes, criteria and thresholds used, and input data. The estimations should be viewed with caution, keeping in mind that they do not reflect measures taken to avoid these impacts (i.e., mitigations). Ultimately, the goals of this acoustic impact model were to predict acoustic propagation, estimate exposure levels, and reliably predict impacts. Figure 3.9-2 shows the conceptual model framework used for the SSTC impact analysis.

*Predicting Impulse, Energy, and Peak Pressure* - Predictive sound analysis software incorporates specific bathymetric and oceanographic data to create accurate sound field models for each source type. Oceanographic data such as the sound speed profiles, bathymetry, and seafloor properties directly affect the acoustic propagation model. Depending on location, seasonal variations, and the oceanic current flow, dynamic oceanographic attributes (e.g., sound speed profile) dramatically can change with time. The sound field model is embedded in the impact model as a core feature used to analyze sound and pressure fields associated with SSTC underwater detonations.

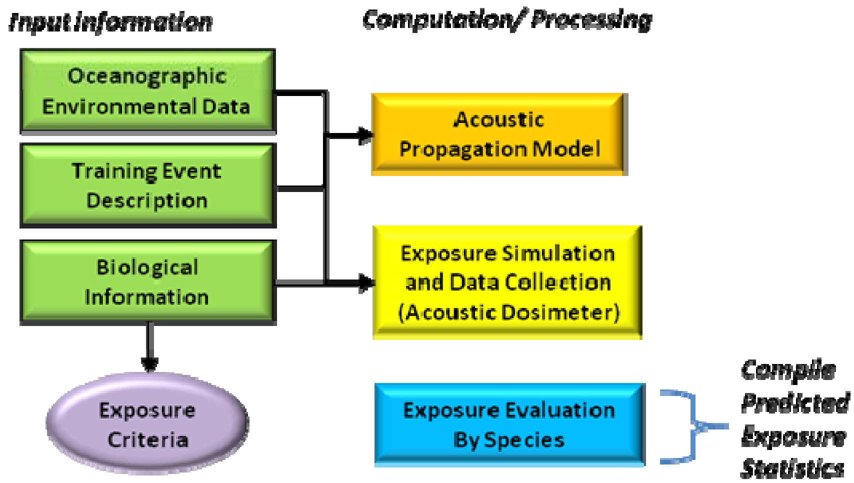



**Figure 3.9-2: Generalized Modeling Process for Estimating Exposures from SSTC Underwater Detonations**

The sound field model for SSTC detonations was the Reflection and Refraction in Multilayered Ocean/Ocean Bottoms with Shear Wave Effects (REFMS) model (Version 6.03). The REFMS model calculates the combined reflected and refracted shock wave environment for underwater detonations using a single, generalized model based on linear wave propagation theory (Cagniard 1962, Britt 1986, Britt et al. 1991). The Cagniard model used in REFMS sometimes is referred to as Generalized Ray Theory in seismology.

The required inputs for the REFMS model include:

- representation of the layered water and sediment environment including compressional wave speed, sediment and water density, and layer depth;
- explosive weight, type, and depth; and
- receiver depth and range from the source.

Similitude equations calculate constants for each explosive type in terms of trinitrotoluene (TNT) equivalents referred to as similarity parameters for explosives. Britt et al. (1991) indicated that care should be taken in using similitude for small charges. REFMS models the variation of physical properties (i.e., sound speed, shear wave speed, and density) with depth in the ocean water column and at the seafloor. The water column and seafloor are represented with up to 300 homogeneous layers depending on the environment where detonations occur.

The model outputs include positive impulse, sound exposure level (sound exposure level; total and in 1/3-octave bands) at specific ranges and depths of receivers (i.e., marine mammals), and peak pressure. The shock wave consists of two parts, a very rapid onset “impulsive” rise to positive peak over-pressure followed by a reflected negative under-pressure rarefaction wave (Figure 3.9-3). Propagation of shock waves and sound energy in the shallow-water environment is constrained by boundary conditions at the surface and seafloor (Figure 3.9-4). In Figure 3.9-4, a hypothetical source is shown below the sea surface and above the seabed, indicating energy from the explosion reaches a subsurface receiver via multi-paths. An iso-speed water column was used for illustrative purposes, because it resembles the simplified SSTC situation. The iso-speed condition indicates no refraction of paths from changes in sound speed.

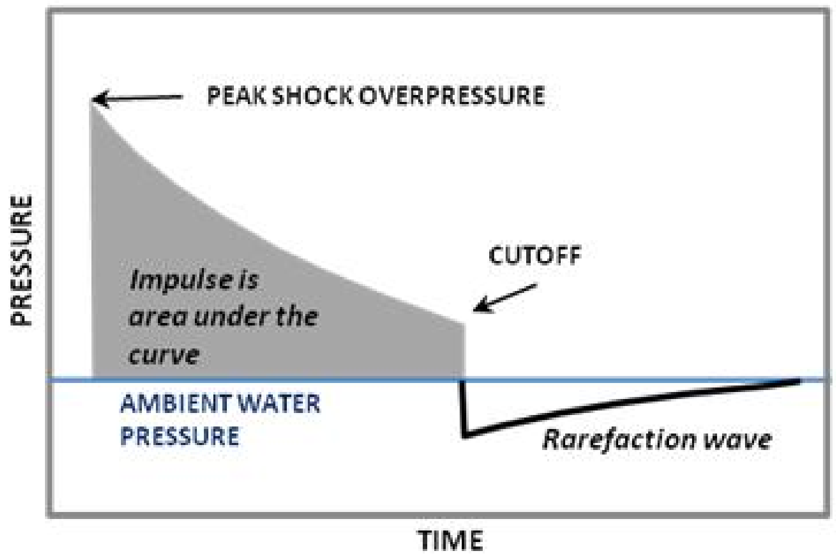



**Figure 3.9-3: Generalized Shock Wave**

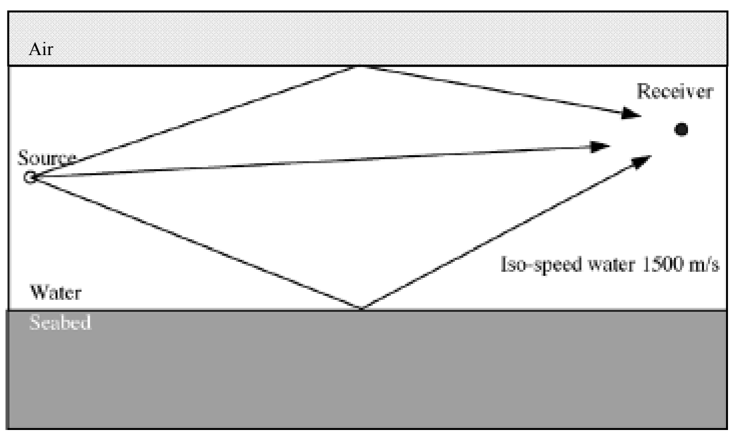



**Figure 3.9-4: Generalized Pathways of Shock Waves and Sound Energy**
(Adapted from Siderius and Porter 2006).

*Estimating Exposures* - Multiple locations (in Boat Lanes and Echo area) and charge depths were used to determine the most realistic spatial and temporal distribution of detonation types associated with each training operation for a representative year. Additionally, the effect of sound on an animal depends on many factors including:

- properties of the acoustic source(s): source level (SL), spectrum, duration, and duty cycle;
- sound propagation loss from source to animal, as well as, reflection and refraction;
- received sound exposure measured using well-defined metrics;
- specific hearing;
- exposure duration; and
- masking effects of background and ambient noise.

To estimate exposures sufficient to be considered injury or significantly disrupt behavior by affecting the ability of an individual animal to grow (e.g., feeding and energetics), survive (e.g., behavioral reactions leading to injury or death, such as stranding), reproduce (e.g., mating behaviors), and/or degrade habitat quality resulting in abandonment or avoidance of those areas, dosimeters were attached to the virtual animals during the simulation process. Propagation and received impulse, SEL, and peak pressure are a function of depth, as well as range, depending on the location of an animal in the simulation space. As stated previously, dosimeters were used to collect and retain exposure logs for SEL with associated time stamps.

*Predicting Impacts* - Predicting impacts to marine mammals from underwater detonations required knowledge regarding the criteria levels associated with mortality, injury, and physiological and behavioral disruption. Criteria and thresholds associated with impulse, SEL, and peak pressure are used to determine impact to internal organs and sensitive auditory tissues. In addition, disruption of behaviors from MSEs was considered. Exposures were quantified based on exceeding the associated thresholds. Note that efforts to minimize exposure to impacts (i.e., proposed mitigation) are not quantified or applied to these estimated exposures.

#### 3.9.2.5.4 Predictive Modeling for Underwater Detonations- Modeling Specifics

The exposure quantities calculated by modeling were based on input data and processes described above. While many modeling parameters and associated process are provided, with greater technical detail in Jordan (2008), the following descriptions elaborate on the generalized process flow as applicable to the SSTC.

*Explosive weight, water depth, and charge depth* - Charge weights used at SSTC vary in size from 0.03 lbs of PETN to 29 lbs NEW of plastic bonded explosives with additives (PBXN). REFMS requires conversion of explosive types to equivalent weights calculated from similitude equations. Standard similitude formulas facilitate explosive propagation modeling using the free-field source properties close to the source, starting at a nominal source-level range of 3.3 ft. Weak shock theory is used to estimate the waveform and levels to ranges beyond a few meters for all ranges because the amplitudes of explosive waveforms are small. Corresponding simulated parameters for the REFMS model for each explosive type, including their discrete NEW (as referenced to TNT), sequence, and position depths below the water surface were chosen to represent each training type. Additionally, four discrete water depths and locations within the SSTC training areas were used (i.e., Echo sub-area and oceanside Boat Lanes [Figure 2-1]).

Charge depths within the water column were not fixed but relative to the surface and seafloor at the locations within the Boat Lanes. Relative charge depth was calculated as the surface to 5 ft below the surface for surface charge depth, depth divided by two for the “mid” charge depth (e.g., mid-depth within a 56-ft water column was 28 ft), and seafloor depth plus 1 or 2 ft for bottom charge depth.

*Sound Speed Profiles* - Sound speed profiles to use in the SSTC analysis for all 12 months were acquired from a classified web site maintained by the Naval Oceanographic Office. Unfortunately, these profiles did not specifically cover the nearshore region represented by the oceanside boat lanes or Echo sub-area of the SSTC. The closest Naval Oceanographic Office sound speed profile site was approximately five nautical miles west of the western side of the oceanside Boat Lanes. While this area has a deeper water column and slightly different profiles when compared to empirically measured profiles during SSTC underwater explosive testing, sound speed measurements from the shallower location were only slightly less than the deeper Naval Oceanographic Office location by approximately 100 ft per sec (~2%).

To reconcile this discrepancy, several sensitivity tests were performed to quantify the relative influence of the sound speed profiles on the final Zone of Influence (ZOI) calculations, as well as subsequent marine mammal exposure estimates. Essentially, a 2% increase in sound speed statistically yielded the same 2% increase in ZOI, which was not threshold independent because of the differences in sound speed from month to month. Given this low percentage, the REFMS model was modified to allow uniform adjustments in the sound speed profiles within the water column. This adjustment was applied to all Naval Oceanographic Office sound speed profiles (one for each month). After each sound speed profile was adjusted, the corresponding ZOIs were computed by the modified REFMS model and tabulated for each given threshold. To report representative values for the warm and cold seasons, mean and standard deviation statistics were calculated for May–October and November–April, respectively.

*Sediment Properties* - The bottom sediment was assumed to be consistent throughout the site and was equivalent to the much greater area encompassing southern California. Based on a previous experience in modeling for this region, the bottom sediment for the entire region was considered sandy-silt (Hamilton 1980). The sound-speed ratio for sandy-silt was 1.145 grams per cubic centimeter (g/cm$^3$) with a wet density of 1.941 g/cm$^3$ (Hamilton 1980).

*Charge Depths and Ranges* - The limits of each ZOI and threshold were defined as the distance to the onset of the impact based on each specific threshold. ZOIs were determined for each threshold using REFMS, which concurrently supplied multiple two-dimensional computational points (depth and range). At simulated SSTC sites where the water depths are between 24 and 72 ft, the selected discrete computational points of depth and range were consistent for all thresholds. This two dimensional (range and depth) distribution yielded more than 60 discrete points of REFMS results for evaluating the ZOIs for marine mammal thresholds (impulse [psi-msec], total SEL and SEL in 1/3-octave bands [dB re 1μPa$^2$-sec], and peak pressure ([psi]).

*Animal Movement* - Animal movement was used for modeling Multiple Successive Explosive events (i.e., sequential charges). Movement of animals within the virtual SSTC environment was two dimensional in nature, because the shallow water depth placed a constraint on diving. Only lateral movement (changes in x-y position) based on expected species specific swim speeds (Table 3.9-3) was considered between Multiple Successive Explosive events. Therefore, it was not necessary to establish a depth restriction for the range points above, because the water depths at SSTC were shallow. These maximum SEL ranges then were used to form concentric circles to determine the area affected at or above the exposure thresholds. The number of mammals within this area whose levels are greater than the thresholds for single detonations were summed, scaled by the species densities to quantify the total exposures, and then reported in 1/100ths. By reporting potential exposures to 0.01 of an individual, no error was included by the simulation, only that of the density estimates. One exposure occurred at 0.5 < exposure < 1.49 for Marine Mammal Protection Act determination. Inasmuch as their placement and movement (Multiple Successive Explosive events only) randomly were initialized, 1,000 separate simulations usually are necessary to determine a statistical mean of mammal exposures with standard deviations less than 2% for underwater detonations.

**Table 3.9-3: Estimated Marine Mammal Swim Speeds used in SSTC Multiple Successive Explosive Events Modeling**

| Species | Swim Speeds (meters/second) |
|---|---|
| California sea lion | 2.00 |
| Pacific harbor seal | 1.00 |
| Bottlenose dolphin | 3.08 |
| Gray whale | 1.86 |

When Multiple Successive Explosive events were modeled, the statistical computation became time-dependent. Each mammal swam within the rectangular plane or simulated range space. Mammal movements were initialized by using a random compass heading, swim speed with a random 10% variation of the species mean, and a straight path across the range (Jordan 2008). The animals did not react to the acoustic operations or avoid them in any way. Mammals that exit the defined range space before the next detonation randomly were replaced along the range boundary with a new random swim speed and heading towards the inside of the range space with its dosimeter set to an SEL of zero. Those mammals outside the range space with SELs greater than the thresholds normally are counted towards the final exposure level. This approach kept the population constant throughout the training operation. However, the recorded received levels on the dosimeters were below the explosive thresholds. Thus, exposures reported herein only represent those animals found inside the range space for all training operations (Jordan 2008).

*Zones of Influence (ZOI)* **-** The outer boundary of the ZOI is defined by the maximum radius (i.e., range) at which the exposure threshold occurs (Table 3.9-2). For the SSTC determination of the ZOI, improvements concurrently were made to the REFMS tool to allow multiple depths and range points given each threshold (Jordan 2008). In the ZOI determinations, single detonations were considered separate events. Multiple Successive Explosive events were handled differently in terms of ZOIs based on the total and 1/3-octave band SEL thresholds. The spatial and temporal distribution of the detonations, as well as the incoherent accumulation of the resultant SELs, were needed to model Multiple Successive Explosive events.

*Computational Process* - The schematic of the computational sequence shows five processing steps as a sequence of calculations (Figure 3.9-5). Software processing modules (red font) are stated for each step with two ultimate outcomes, ZOIs and marine mammal exposures.

The monthly in-situ sound speed profiles were acquired from the Generalized Digital Environmental Model (GDEM) database. Two preprocessing routines (Interpolate Generalized Digital Environmental Model Profiles [INSVP] and Reflection and Refraction Multi-Layered Ocean/Ocean Bottoms with Shear Wave Effects Input Data [REFMSIN]) were executed to process the environmental conditions and create the initial REFMS input dataset. The explosive characteristics, detonation location, position in the water column, bottom sediment properties, and local sound speed profiles were used to determine wave propagation characteristics of the detonations at the SSTC with the REFMS model. REFMS resolved the traveling explosive compression wave using applicable spreading rules. REFMS was the basis for the two core computation phases (REFMS Modification 1 Marine Species Effects [REFMSMOD1] and Species Simulation Movement [SPESIM]). Static (REFMSMOD1) and dynamic (SPESIM) routines sequentially were executed to determine estimated exposures for cases of single detonations and Multiple Successive Explosive events. REFMSMOD1 is an enhanced version of the original REFMS software that explicitly evaluated the ZOIs using specific NMFS criteria and thresholds. SPESIM tracked the individual received SELs with the virtual dosimeter, when an operation included Multiple Successive Explosive events. This tool includes species movement and uses the acoustic property predictions of REFMS to dynamically evaluate the exposures. Exposure values were not retained for multiple training operations because all were considered independent of one another.

For very shallow water (VSW where water depth is less than 24 ft), in-situ empirical data regarding propagation of sources was available and used to assess impacts in a separate report (unpublished Naval Special Warfare Command [NSWC]/Anteon Corporation 2005). In their analysis REMFS and in-situ data for small charges were compared. One of the major findings was that REFMS predictions made for VSW were unreliable because of the strong influence of boundary conditions. REFMS was not designed to model impulsive sources at boundaries where bottom sediments and surface conditions, such as in the surf zone. Test data and model estimations indicated good predictability when water depth was near 24 ft, therefore, propagation modeling was deemed suitable and performed where empirical data were unavailable (water depth of 24–72 ft).

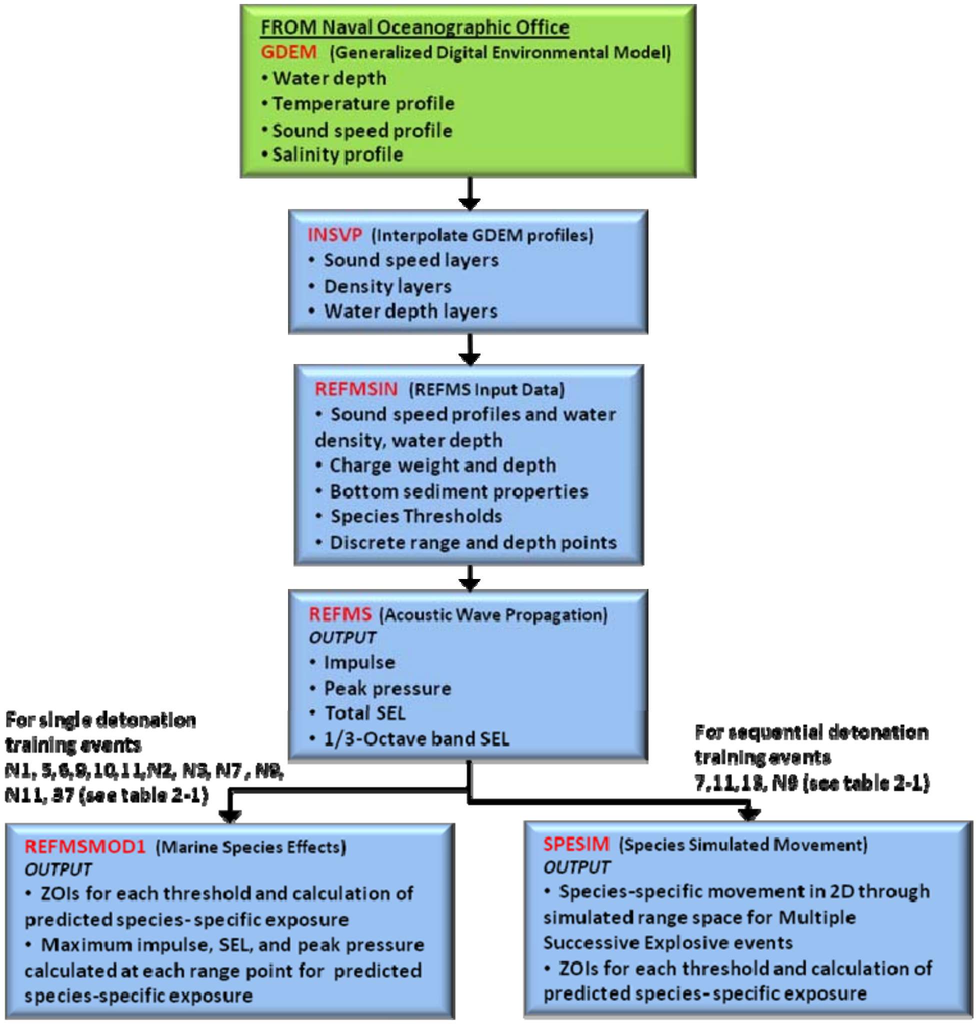



**Figure 3.9-5: Computational Sequence for Determining Effects of Underwater Detonations at SSTC**

Therefore, all marine mammal exposures presented are modeled conservatively to have occurred between 24-72 feet. Likely propagation and associated exposure for any underwater detonation event in water less than 24 feet is likely to be much less.

### 3.9.2.5.5 Key SSTC Modeling Caveats and Assumptions

The exposure quantities predicted from modeling of training events rely on many factors but are influenced greatly by assumptions, methods, and criteria used during the process. In general, the SSTC impact assessment is a conservative approach (i.e., over predicts likely exposures) based on some generalities that have to be assumed because of training event parameters, criteria application, or model limitations. Therefore, the caveats and modeling assumptions described below should be considered when evaluating the marine mammal predicted exposures within the context of this EIS.

Of note, these assumptions and resulting model estimations do not account for the protective nature of the Navy's current or proposed mitigations, which in reality would eliminate or reduce any potential exposures.

*Modeling Assumptions - Operational Assumptions*

- Oceanographically, there are two seasons at SSTC, a warm season from May–October and a cold seasons from November–April.
- Underwater training events represent SSTC range schedule maximums with range time fully booked.
- This authorization does not account for training schedule change, event cancelations due to weather or other unforeseen factors, unit deployments which would mean fewer personnel needing training, and other real-world and exercise conditions that may result in fewer annual underwater detonations.
- All training operations were evenly distributed across months with 50% of the events occurring during each season (50% during warm season, 50% during cold season).
- No two training operations were assumed to occur during the same day, and each training event was treated as an isolated event.
- Each training activity for single detonations was treated as an isolated event; therefore, exposures represent short-term and immediate impacts. Events with single explosions did not take into account animal movement.
- Events with Multiple Successive Explosive events were treated as training events requiring the accumulation of received energy (SEL) with consideration of mammal movement. Movement within the virtual SSTC environment was two-dimensional and did not take into account depth as a dimension; therefore, marine mammals were assumed to be in the water column where the effect of the detonations was greatest.
- Sequential charges are either conducted with a 10 second delay between detonations or 30 minute delay between detonations. However, the actual temporal relationships between explosions can be longer depending on conditions (set-up, operator experience, weather, marine mammal sighting, etc.).
- All underwater detonations proposed for SSTC were modeled as if they will be conducted in shallow water of 24 to 72 feet, including those that would normally be conducted in very shallow water (VSW) depths of zero to 24 feet.

*Modeling Assumptions - Biological Assumptions*

- Marine mammals and associated densities are considered to always be present within SSTC and densities are spread evenly through all of the oceanside SSTC Boat Lanes. [In fact, marine mammal presence within SSTC is variable, dynamic, and very patchy, but REFMS currently does not have algorithms to address this complexity, nor is the state of science adequate for predicting patchy marine mammal occurrence at small spatial scales]
- Percentage of time pinnipeds haul out was not factored into the modeling, although California sea lions and harbor seals may not be exposed during the time they are out of the water.
- Mean marine mammal densities were used during exposure calculations and took into account the worst-case water depth, animal depth, and sound speed profile to conservatively (i.e., over predict) the greatest amount of potential exposures.
- All estimated exposures are seasonal averages (mean) plus one standard deviation.

*Criteria Assumptions*

The quantitative exposure modeling methodology produces numbers of individuals exposed to the effects of underwater explosions exceeding the thresholds used. All estimated exposures are seasonal averages (mean) plus one standard deviation (σ) using one-half of the yearly training tempo. This provides a conservative approach to estimating exposures typical of training during a single year. Mitigation methods were not quantified and implementation is not reflected in exposure estimates. Results from acoustic impact exposure models should be regarded as exceedingly conservative estimates that are strongly influenced by limited biological data. While the numbers generated from these models provide predictions of marine mammal exposures for consultation with NMFS, the short duration and limited geographic extent of explosive events does not necessarily mean that these exposures will ever be realized.

#### 3.9.2.5.6 Model Results Explanation

Acoustic exposures are evaluated based on their potential direct effects on marine mammals, and these effects are then assessed in the context of the species biology and ecology to determine if there is a mode of action that may result in the acoustic exposure warranting consideration as a harassment level effect.

A large body of research on terrestrial animal and human response to airborne sound exists, but results from those studies are not readily extendible to the development of behavioral criteria and thresholds for marine mammals. For example, "annoyance" is one of several criteria used to define impact to humans from exposure to industrial sound sources. Comparable criteria cannot be developed for marine mammals because there is no scientifically acceptable method for determining whether a nonverbal animal is annoyed (NRC 2003). Further, differences in hearing thresholds, dynamic range of the ear, and the typical exposure patterns of interest (e.g., human data tend to focus on eight hour-long exposures) make extrapolation of human sound exposure standards inappropriate. At the present time there is no general scientifically accepted consensus on how to account for behavioral effects on marine mammals exposed to anthropogenic sounds including explosions (NRC 2003, NRC 2005).

### 3.9.2.6 Estimating Marine Mammal Exposures from Pile Driving Activities

Noise associated with ELCAS installation activities includes a loud impulsive sound derived from driving piles into the soft sandy substrate of the SSTC waters to temporarily support a causeway of linked pontoons. Two hammer-based methods will be used to install/remove ELCAS piles: impact pile driving for installation and vibratory driving for removal. The impact hammer is a large metal ram attached to a crane. A vertical support holds the pile in place and the ram is dropped or forced downward. The energy is then transferred to the pile which is driven into the seabed. The ram is lifted by a diesel power source.

At the end of the training, a vibratory hammer attached to the pile head will be used to remove piles by applying a rapidly alternating force to the pile by rotating eccentric weights about shafts, resulting in an upward vibratory force on the pile. The vertical vibration in the pile disturbs or "liquefies" the sediment next to the pile causing the sediment particles to lose their frictional grip on the pile.

Since 1997, NMFS has been using generic sound exposure thresholds to determine when an activity in the ocean that produces impact sound (i.e., pile driving) results in potential take of marine mammals by harassment (70 CFR 1871). NMFS is developing new science-based thresholds to improve and replace the current generic exposure level thresholds, but the criteria have not been finalized (Southall et al. 2007). Current NMFS criteria (70 FR 1871) regarding exposure of marine mammals to underwater impulsive sounds (e.g., impact pile driving) is that cetaceans exposed to sound levels of 180 dB root mean squared (RMS in units of dB re 1 μPa) or higher and pinnipeds exposed to 190 dB RMS or higher are considered to have been taken by Level A (i.e., injurious) harassment. Marine mammals (cetaceans and pinnipeds) exposed to impulse sounds of 160 dB RMS but below injurious thresholds (i.e, 180 or 190 dB) are considered to have been taken by Level B behavioral harassment. Marine mammals (cetaceans and pinnipeds) exposed to continuous noise of 120 dB RMS (e.g., vibratory pile driving) or above are considered to have been taken by Level B behavioral harrassment.

The methodology for analyzing potential impacts from ELCAS activities is similar to that of analyzing explosives, which is presented in Section 3.9.2.4. The ELCAS analysis includes two steps used to calculate potential exposures:

1. Estimate the zone of influence for Level A injurious and Level B behavioral exposures for both impact pile driving and vibratory pile removal using the practical spreading loss model.
2. Estimate the number of species exposed using species density estimates (Table 3.9-1) and estimated zones of influence.

The practical spreading loss model is used to estimate the attenuation of underwater sound over distance. NOAA and USFWS have accepted the use of the practical spreading loss model to estimate transmission loss of sound through water for past pile driving calculations (California Department of Transportation [CADOT] 2009). The formula for this propagation loss can be expressed as:

$$TL = F * \log (D1/D2)$$

Where:

TL = transmission loss (the sound pressure level at D1 minus the sound pressure level at D2, in RMS, dB re 1µPa)

F = attenuation constant

D1 = distance at which the targeted transmission loss occurs

D2 = distance from which the transmission loss is calculated

The attenuation constant (F) is site-specific factor based on several conditions, including water depth, pile type, pile length, substrate type, and other factors. Measurements conducted by the CADOT and other consultants (Greeneridge Science) indicate that the attenuation constant (F) can vary from 5 to 30. For pile driving sounds that are higher frequency (e.g., smaller-diameter steel piles), the transmission loss can be higher than losses associated with piles that predominantly produce lower frequencies (e.g., larger diameter piles). Small-diameter steel H-type piles have been found to have high F values in the range of 20 to 30 near the pile (i.e., between 10 and 20 meters) (CADOT 2009). In the absence of empirically measured values at SSTC, the F value for SSTC is assumed to be on the low (conservative) end of the small-diameter steel piles (F=20). In subsequent consultation with the NMFS Office of Protected Resources, it was requested that the Navy take a still more conservative approach and use a F value of F=15.

The exposures predicted from ELCAS assessment rely on many factors but are influenced greatly by assumptions, methods, and criteria used. The following list of assumptions, caveats, and limitations is not exhaustive but reveals several features of the technical approach that influence exposure prediction:

1. Significant scientific uncertainties are implied and carried forward in any analysis using marine mammal density data as a predictor for animal occurrence within a given geographic area.
2. The assessment conservatively assumed that all ELCAS training would occur along the oceanside of SSTC. In actuality, they are also conducted in the Bravo Beach training area on the Bayside of SSTC-N. Marine mammals are rarely encountered within this southern portion of San Diego Bay, and given this lack of occurrence, exposures to marine mammals during ELCAS training in the Bay is not expected. By assuming that all ELCAS training would occur on the oceanside of SSTC-N, exposure estimates may overrepresent actual potential exposures. For example, the estimates may be double of what they might actually be if half of the ELCAS training was to occur on the Bayside.
3. Marine mammal are assumed to be uniformly distributed within the ocean waters adjacent SSTC.
4. The tempo of training activities was divided evenly throughout the year with two oceanographic seasons, defined as warm and cold at this location, each having ½ total events for simulated purposes.
5. There are data limitations. Some of the data supporting the analysis was derived from other projects with different environmental and project conditions (animal densities, pile driving source levels, and transmission loss parameters).

The ELCAS exposure assessment methodology is an estimate of the numbers of individuals exposed to the effects of ELCAS activities exceeding NMFS established thresholds. Of significant note in these exposure estimates, mitigation methods were not quantified within the assessment and successful implementation of mitigation is not reflected in exposure estimates. Results from acoustic impact exposure assessments should be regarded as conservative estimates that are strongly influenced by limited biological data. While the numbers generated from the ELCAS exposure calculations provide conservative overestimates of marine mammal exposures for consultation with NMFS, the short duration and limited geographic extent of ELCAS training would further limit actual exposures.

### 3.9.2.7 Other Effects Considered

There is the potential for non-auditory impacts on marine mammals from direct physical injury from underwater detonations or collisions with vessels. The use of currently implemented monitoring and marine mammal buffer zones (as defined in the next section) during mine detonation activities can prevent such impacts on marine mammals. Vessel operators avoid surface obstructions during transit and combined with low transit speeds, minimize the potential of collision with a marine mammal.

### 3.9.2.8 No Action Alternative

#### 3.9.2.8.1 Underwater Detonations

Small explosives, up to 20 pounds, will be used as part of exercises to neutralize simulated mines as well as qualification/certification training. Under the No Action Alternative and presented in Section 3.8.2.2.3 (Table 3.8-10), the exercises are conducted up to 103 times a year in the offshore boat lanes at SSTC. As presented in Table 3.9-4, underwater detonation activities are distributed throughout the SSTC boat lanes, with larger charge weights utilized in the center boat lanes at SSTC-N and SSTC-S.

As indicated in Section 3.4, Hazardous Materials and Waste (Table 3.4-5), the major byproducts of these detonations are nitrogen, carbon dioxide, water, and carbon monoxide. Only trace amounts of organic compounds would be left following an underwater detonation of explosives. At such concentrations, these substances would not affect water quality and would have no direct effect on marine mammals.

**Table 3.9-4: SSTC Underwater Detonation Range Protocol**

| Charge Size | Boat Lane | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 |
| | Y1 | Y2 | R1 | R2 | G1 | G2 | B1 | B2 | O1 | O2 | W1 | W2 | P1 | P2 |
| VSW (0 – 4 fathoms) | | | | | | | | | | | | | | |
| Off bottom (< 3.6 lb) | | x | x | x | x | x | x | x | x | | | x | x | |
| Bottom (< 5 lb) | | x | x | x | x | x | x | x | x | | | x | x | |
| Bottom (< 15 lb) | | | x | x | x | x | x | x | | | | | | |
| Shallow (4 – 12 fathoms) | | | | | | | | | | | | | | |
| < 5 lb single | | x | x | x | x | x | x | x | x | | | x | x | |
| < 15 lb (multiple) | | | x | x | x | x | x | x | | | | | | |
| 15 – 29 lb | | | | | x | x | | | | | | | | |

Note: VSW off bottom (<3.6 lbs, SWAG) bayside activities occur in Echo
"X" denotes activity occurs in boat lane

Severity of an effect often is related to the distance between the sound source and a marine mammal and is influenced by source characteristics (Richardson and Malme 1995). For SSTC, zones of exposure were estimated for the different charge weights, charge depths, water depths, and seasons. These ZOI calculated ranges are shown in Table 3.9-5. For single detonations, the ZOI were calculated using the range associated with onset TTS while for those events with multiple charges the calculation was based on the non-TTS behavior disruption. Calculating the zones of influence in terms of total SEL, 1/3-octave bands SEL, impulse, and peak pressure for sequential (10 sec timed) and sequential detonations (> 30 minutes) were slightly different than the single detonations. For the sequential explosives, ZOI calculations considered spatial and temporal distribution of the detonations, as well as the effective accumulation of the resultant acoustic energy. To calculate the ZOI, sequential detonations were modeled such that explosion SEL were summed incoherently to predict zones while peak pressure was not.

Based on the modeling approach applied, as discussed in Section 3.9.2.4, and without consideration of current mitigation measures, activities under the No Action Alternative injury (Level A harassment) to marine mammals is not anticipated. However, underwater detonation activities could result in non-injurious (Level B) harassment to cetaceans and pinnipeds. For evaluation of TTS, a dual criteria is used, allowing one value to be presented as a TTS exposure level. This TTS dual criterion reduces the TTS to a single exposure level where the maximum truncated value is picked under the SEL (182 dB) or peak pressure (23 psi) column. Specifically, 78 annual exposures to pressure from underwater detonations could result in TTS (Level B harassment, Table 3.9-6). Of these 78 annual exposures, 52 exposures could result in TTS for bottlenose dolphins and 26 exposures could result in TTS for California sea lions due to pressures from underwater detonations. Exposures for harbor seals and gray whales are not anticipated due to low species density and the limited zone of influence of the underwater detonations. As mentioned previously, these exposure modeling results are estimates of marine mammal underwater detonation sound exposures without consideration of standard mitigation and monitoring procedures. Table 3.9-6 summarizes the species exposure levels for all detonations over an entire year in the SSTC ROI.

**Table 3.9-5: Maximum Underwater Detonation Zones of Influence for "No Action" Alternative**

| Underwater Detonation Operation | Charge Weight Used[1] | Season | Level B Harrassment | Level A Harrassment | | Mortality |
|---|---|---|---|---|---|---|
| | | | Onset of TTS[2] / Non-TTS[3] (yards) | Onset of slight lung injury (13.0 psi-msec) (yards) | 50% TM rupture (205 dB re $1\mu Pa^2$-sec) (yards) | Onset of extensive lung injury (30.5 psi-msec) (yards) |
| Mine Countermeasures | 20 | Warm | 470 | 360 | 80 | 80 |
| | | Cold | 450 | 160 | 80 | 80 |
| Floating Mine | ≤ 5 | Warm | 240 | 20 | 80 | 20 |
| | | Cold | 260 | 20 | 80 | 20 |
| Unmanned Underwater Vehicle Activities | 20 | Warm | 440 | 360 | 80 | 80 |
| | | Cold | 400 | 150 | 80 | 80 |
| Marine Mammal Systems Activities (sequential) | 13 | Warm | 330/380 | 130 | 70 | 80 |
| | | Cold | 410/430 | 140 | 70 | 80 |
| Marine Mammal Systems Activities (individual) | 13 | Warm | 320 | 130 | 60 | 80 |
| | | Cold | 350 | 140 | 70 | 80 |
| Dive Platoon[4] (mid-depth) | 3.5 | Warm | 330/430 | 70 | 130 | 40 |
| | | Cold | 410/610 | 70 | 130 | 40 |
| Dive Platoon[4] (bottom) | 3.5 | Warm | 330/470 | 80 | 90 | 50 |
| | | Cold | 370/560 | 90 | 90 | 50 |
| Mine Neutralization[4] | 3.5 | Warm | 330/470 | 80 | 90 | 50 |
| | | Cold | 370/560 | 90 | 90 | 50 |

[1] Charge weights are listed in pounds
[2] Maximum ZOI based on greatest range from dual criteria (182 dB re $1\mu Pa^2$-sec or 23 psi)
[3] Behavioral Disruption Non-TTS (listed only for (sequential detonations)
[4] Sequential Detonations

**Table 3.9-6: Modeled Estimates of Exposed Species from Underwater Detonations Without Implementation of Mitigation Measures: No Action Alternative**

| Species | | | NO ACTION ALTERNATIVE: Season Average Mammals Exposure (All Sources) | | | |
|---|---|---|---|---|---|---|
| | | | Level B Behavior (MSE only) | Level B TTS | Level A Injury | Level A Mortality |
| | | | 177 dB | 182 dB / 23 psi | 205 dB / 13.0 psi-ms | 30.5 psi-ms |
| Cetaceans | Gray Whale | Warm | - | - | - | - |
| | | Cold | 0 | 0 | 0 | 0 |
| | Coastal Bottlenose Dolphin | Warm | 16 | 26 | 0 | 0 |
| | | Cold | 24 | 26 | 0 | 0 |
| Pinnipeds | California Sea Lion | Warm | 4 | 0 | 0 | 0 |
| | | Cold | 24 | 26 | 0 | 0 |
| | Harbor Seal | Warm | 0 | 0 | 0 | 0 |
| | | Cold | 0 | 0 | 0 | 0 |
| Total Exposures | | | 68 | 78 | 0 | 0 |

In addition to possible exposures that could result in TTS, modeling indicates that the No Action Alternative could also result in the potential for 68 non-physiological behavioral exposures. While physiological impacts were predicted for all activities, non-physiological behavioral impacts were predicted only for those exercises which involved multiple detonations during a training scenario. Coastal bottlenose dolphins were predicted to have a similar number of non-physiological behavioral exposures in both the warm (16) and cold (24) seasons, while California sea lions were predicted to have a higher number of non-physiological behavioral exposures during the cold season (24) than in the warm season (4).

To reduce the potential for behavioral or physiological damage such as TTS, or tissue injury, a buffer zone is established each detonation area. As discussed in Section 3.9.1.7, operations would not be conducted if marine mammals are present in the buffer zone. The buffer zone for VSW underwater detonations (in zero to 24 feet of water), would be the largest zone of influence as discussed in Section 3.9.2.4.3 (1,200 feet). The buffer zone for shallow water underwater detonation activities (in 24 to 72 feet of water depth) would be based on the rounding up the largest zone of influence from a single detonation shown in Table 3.9-5: 1,500 feet (500 yards). This type of mitigation would likely prevent animals from being exposed to the loudest explosive effects that could potentially result in behavioral, TTS or PTS and more intense behavioral reactions. The implementation of the current mitigation and monitoring procedures in the SSTC, as described in Section 3.9.2.7, will minimize the potential for impacts to individual marine mammals or marine mammal stocks from underwater detonations.

### 3.9.2.8.2 Aircraft Activities

Various types of helicopters are regularly used in training exercises throughout the ROI. These aircraft overflights produce airborne noise and some of this energy is transmitted into the water. Marine mammals could be exposed to noise associated with aircraft overflights while at the surface or while submerged. In addition to sound, marine mammals could react to the shadow of a low-flying aircraft and/or, in the case of helicopters, surface disturbance from the downdraft.

Transmission of sound from a moving airborne source to a receptor underwater is influenced by numerous factors and has been addressed by Urick (1972), Young (1973), Eller and Cavanagh (2000), Laney and Cavanagh (2000), and others. Sound is transmitted from an airborne source to a receptor underwater by four principal means:

1. Direct path, refracted upon passing through the air-water interface.
2. Direct-refracted paths reflected from the bottom in shallow water.
3. Lateral (evanescent) transmission through the interface from the airborne sound field directly above.
4. Scattering from interface roughness due to wave motion.

Aircraft sound is refracted upon transmission into water because sound waves move faster through water than through air (a ratio of about 0.23:1). Based on this difference, the direct sound path is totally reflected if the sound reaches the surface at an angle more than 13 degrees from vertical. As a result, most of the acoustic energy transmitted into the water from an aircraft arrives through a narrow cone with a 26-degree apex angle extending vertically downward from the aircraft (Figure 3.9-6). The intersection of this cone with the surface traces a “footprint” directly beneath the flight path, with the width of the footprint being a function of aircraft altitude.

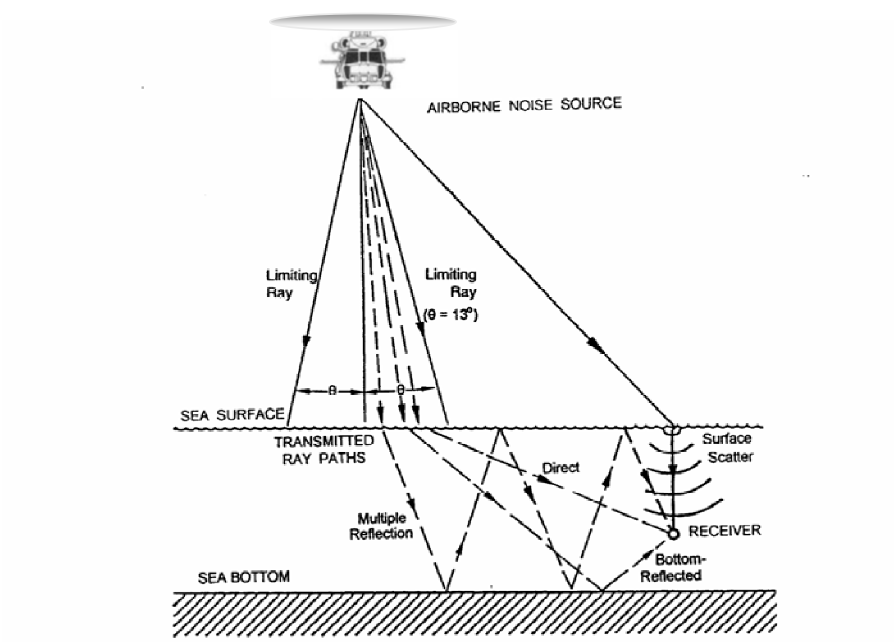



**Figure 3.9-6: Characteristics of Sound Transmission through Air-Water Interface**

Helicopter overflights can occur throughout SSTC for a variety of training exercises, such as mine countermeasure activities (Activities 4, 6, 7, and 12, Table 2-1), amphibious activities (Activities 16, 25, 26, Table 2-1), and Naval Special Warfare (NSW) activities (Activities 29 and 30, Table 2-1). Unlike fixed-wing aircraft, helicopter training activities can occur at low altitudes (approximately 100 feet) over the water, which increases the likelihood that marine mammals would respond.

Very little data are available regarding reactions of cetaceans to helicopters. One study observed that sperm whales showed no reaction to a helicopter until the whales encountered the downdrafts from the propellers (Clarke 1956). Other species such as bowhead whales and beluga whales show a range of reactions to helicopter overflights, including diving, breaching, change in direction or behavior, and alteration of breathing patterns, with belugas exhibiting behavioral reactions more frequently than bowheads (38 and 14 percent of the time, respectively) (Patenaude et al. 2002). These reactions were less frequent as the altitude of the helicopter increased to 150 m or higher.

Helicopter activities would have the greatest impact when flying low and hovering at altitudes down to 100 feet. Noise modeling indicates that the predicted sound level at a depth of 1 foot resulting from the overflight of an SH-60 helicopter at 100 feet would be approximately 100 to 118 dB re 1 µPa (frequencies of 20 Hz and 5 kHz). This could cause some marine mammals to dive and move away from the aircraft. For example, gray whales will react 10 percent of the time to helicopter sounds transmitted underwater in excess of 115 dB re 1 µPa and react 50 percent of the time to sounds in excess of 120 dB re 1 µPa (Moore and Clarke 2002). Given the variable and sparse seasonal density of gray whales (Table 3.9-1), the probability of a helicopter overflight occurring over a migrating whale is low. Aircraft overflights over a cetacean in the water may elicit short-term reactions such as a dive, but they are highly unlikely to disrupt overall behavioral patterns such as migrating, nor would they be likely to result in serious injury.

One seal species (harbor) and one sea lion species (California) occur regularly within the ROI. Helicopters are used in studies of several species of seals hauled out and is considered an effective means of observation (Gjertz and Børset 1992, Bester et al. 2002, Bowen et al. 2006), although they have been known to elicit behavioral reactions such as fleeing (Hoover 1988). Jehl and Cooper (1980) indicated that low-flying helicopters, humans on foot, sonic booms, and loud boat noises were the most disturbing influences to pinnipeds. In other studies, harbor and other species of seals and sea lions showed no reaction to helicopter overflights (Gjertz and Børset 1992). However, there are no known haul-out locations for these two species within the SSTC. Additionally, the typical flight path of aircraft used in training activities does not overlap any known haul-out locations for harbor seals or sea lions. Thus, the likelihood of a harbor seal or California sea lion being hauled out and underneath the flight path of an aircraft is extremely low. It is possible that an animal could be temporarily hauled out on a buoy or dock and aircraft overflights may elicit short-term reactions such as flushing into the water, but they are highly unlikely to disrupt overall behavioral patterns such as foraging or breeding as the disturbance is transient and short-term in nature, allowing the animal to return to its previous behavioral state. Similarly, aircraft overflights of pinnipeds in the water may elicit short-term reactions such as startle or alert reactions. However, they are highly unlikely to disrupt overall behavior patterns such as migrating, breeding, feeding and sheltering, nor would they be likely to result in serious injury.

Marine mammals exposed to low-altitude helicopter overflights under the No Action Alternative could exhibit short-term behavioral responses, but not to the extent where natural behavioral patterns would be abandoned or considerably altered. Helicopter overflights are not expected to result in chronic stress because it is extremely unlikely that individual animals would be repeatedly exposed. As such, helicopter overflights are not expected to result in Level A or Level B harassment as defined by the MMPA and helicopter overflights over territorial waters would have no notable effect on marine mammals.

#### 3.9.2.8.3 Marine Vessels

##### Overview

A variety of vessels including standard and amphibious ships, small boats, and hovercraft (collectively referred to as vessels) will be used for SSTC activities. Vessel movements have the potential to affect marine mammals by directly striking or disturbing individual animals. The probability of vessel and marine mammal interactions occurring in the ROI is dependent upon several factors including numbers, types, and speeds of vessels; the regularity, duration, and spatial extent of activities; the presence/absence and density of marine mammals; and protective measures implemented by the Navy. Activities involving vessel movements occur intermittently and are variable in duration, ranging from a few hours up to two weeks. Under the No Action Alternative, marine vessels both mechanically driven and self-propelled are utilized in 41 of the 78 training activities (Activities 1- 3, 5 -14, 16, 18, 20 - 28, 32 - 35, 37 - 41, 44 - 46, 49, 51 - 53, 57, 77, 78, Table 2-1). The vast majority of these exercises use less than five marine vessels, both mechanically driven and self-propelled (Appendix C). These activities are widely dispersed throughout the marine areas of SSTC, which encompasses approximately 15 $nm^2$. Consequently, as these operations are spread throughout the year, as well as on any particular day of training activities, the density of ships within the ROI at any given time is extremely low.

##### Disturbance Associated with Vessel Movements

Marine mammals are frequently exposed to vessels due to research, ecotourism, commercial and private fishing traffic, and government activities. The presence of vessels has the potential to alter the behavior patterns of marine mammals. It is difficult to differentiate between responses to vessel sound and visual cues associated with the presence of a vessel; thus, it is assumed that both play a role in prompting reactions from animals. Anthropogenic sound has increased in the marine environment over the past 50 years (Richardson et al. 1995, NRC 2003) and can be attributed to vessel traffic, marine dredging and construction, oil and gas drilling, geophysical surveys, sonar, and underwater explosions.

Marine mammals react to vessels in a variety of ways. Some respond negatively by retreating or engaging in antagonistic responses (breaching, fluke-slapping, etc.) while other animals ignore the stimulus altogether (Watkins 1986, Terhune and Verboom 1999). The predominant reaction is either neutral or avoidance behavior, rather than attraction behavior. For example, species of delphinids can vary widely in their reaction to vessels. Many exhibit mostly neutral behavior, but there are frequent instances of observed avoidance behaviors (Hewitt 1985; Würsig et al. 1998). In addition, approaches by vessels can elicit changes in behavior, including a decrease in resting behavior or change in travel direction (Bejder et al. 2006). Alternately, some of the delphinid species exhibit behavior indicating attraction to vessels. This can include solely approaching a vessel (David 2002), and species such as common, rough-toothed and bottlenose dolphins are frequently observed bow riding or jumping in the wake of a vessel (Norris and Prescott 1961; Shane et al. 1986; Würsig et al. 1998; Ritter 2002). These behavioral alterations are short-term and would not result in any lasting effects.

Gray whale responses to noise include changes in swimming speed and direction to move away from the sound source; abrupt behavioral changes from feeding to avoidance, with a resumption of feeding after exposure; changes in calling rates and call structure; and changes in surface behavior, usually from traveling to milling (e.g., Moore and Clarke 2002). Gailey et al. (2007) reported no apparent behavioral disturbances for gray whales in response to low-frequency seismic survey.

Marine vessels are one of the most frequent sources of sound in the marine environment within SSTC. Vessel noise is caused by both engine noise transmission through the hull and cavitations from propellers producing both narrow and broadband sounds. Hovercraft were recorded in the frequency ranges of 50 to 2000 Hz with a source level up to 121 dB re 1 µPa (Richardson et al. 1995). Recordings of a Griffon 2000TD hovercraft passing a hydrophone at full power in Prudhoe Bay, Alaska indicated broadband (10 to 10,000 Hz) levels reaching 133 dB re 1 μPa (Blackwell and Greene 2005), with most spectral energy centered around 87 Hz.

The probability of Landing Craft, Air Cushion (LCAC) and marine mammal interactions occurring in the ROI is dependent upon several factors including the regularity, duration, and spatial extent of activities; the presence/absence and density of marine mammals; and protective measures implemented by the Navy. Activities involving LCAC occur four times a year, involve small numbers of vessels, and occur along the boat and beach lanes of SSTC-N and SSTC-S. Consequently, the density of ships within the ROI during LCAC activities is extremely low, which when combined with the low densities of marine mammals, minimizes disturbance effects on marine mammals in the area; therefore, any effects would be extremely localized.

Sound produced may also be produced by vessels involved in the ELCAS training. Vessel noise is a combination of narrowband, tonal sounds at specific frequencies with broadband sounds with energy spread as a continuum across a wide range of frequencies up to 100 kHz (Greene and Moore 1995). Source levels of boats used during SSTC ELCAS are expected to be low with small boats using outboards (120-150 dB) to tugboats working with barges (140 – 160 dB).

Marine vessel traffic related to the SSTC activities would pass near marine mammals only on an incidental basis. Most of the studies mentioned previously examine the reaction of animals to vessels that approach and intend to follow or observe an animal (i.e., whale watching vessels, research vessels, etc.). Reactions to vessels not pursuing the animals, such as those transiting through an area or engaged in training exercises, may be similar but would likely result in less stress to the animal because they would not intentionally approach animals. Cetacean species pay little attention to transiting vessel traffic as it approaches, although they may engage in last minute avoidance maneuvers (Laist et al. 2001). As previously noted, quick avoidance maneuvers are short-term alterations and are not expected to permanently impact a marine mammal.

Vessel movements under the No Action Alternative are not expected to result in chronic stress because, as discussed above, Navy vessel density in the ROI would remain low and the Navy implements mitigation measures to avoid marine mammals. General disturbance associated with vessel movements is not expected to result in Level A or Level B harassment as defined by the MMPA and vessel disturbances are highly unlikely to disrupt overall behavior patterns such as migrating, breeding, feeding and sheltering, of marine mammals in the ROI.

### Vessel Collisions with Marine Mammals

Ship strikes are known to affect large whales in southern California waters. The most vulnerable marine mammals are those that spend extended periods of time at the surface in order to restore oxygen levels within their tissues after deep dives. These species are primarily large, slow moving whales. Smaller marine mammals (for example, bottlenose dolphins) move quickly throughout the water column and are often seen riding the bow wave of large ships.

After reviewing historical records and computerized stranding databases for evidence of ship strikes involving baleen and sperm whales, Laist et al. (2001) found that accounts of large whale ship strikes involving motorized boats date back to at least the late 1800s. Ship collisions remained infrequent until the 1950s, after which point they increased. Laist et al. (2001) concluded that most strikes occur over or near the continental shelf, that ship strikes likely have a negligible effect on the population status of most whale populations, but that for small populations or segments of populations the impact of ship strikes may be significant. However, in the near-shore waters of the ROI, any large whale appearing in the shallow water boat lanes would be readily apparent. Between 1975 and 2002, only two ship strikes of gray whales have been reported in the waters offshore of Point Loma, only one of which was attributed to naval activities.

Small numbers of California sea lions, harbor seals, or bottlenose dolphin may encounter Navy vessels in the SSTC. Given the low density of Navy ships in the ROI, the likelihood that a vessel collision would occur under the No Action Alternative is very low. Vessel collisions in territorial waters are highly unlikely and do not represent a notable source of effect on marine mammals.

Any marine mammal observed after a vessel collision will be reported to Navy environmental representatives from the regional Navy shore commander (Commander, Navy Region Southwest) and U.S. Pacific Fleet, Environmental Office, San Diego Detachment. The Navy will report these events to the Stranding Coordinator of NMFS' Southwest Regional Office using Marine Mammal Stranding communication trees and contact procedures established for the Southern California Range Complex. These voice or email reports will contain the date and time of the sighting, location (or if precise latitude and longitude is not currently available, then the approximate location in reference to an established SSTC beach feature), species description (if known), and indication of the animals status.

### 3.9.2.8.4 Amphibious and Beach Activities

This section deals primarily with amphibious and beach activities that may have a potential to impact marine mammals. Beach and inland activities have a low potential for impact on marine mammals because there are no breeding or haul-out areas within the SSTC ROI. The following sections address those Amphibious and Beach activities that may affect the marine mammals expected to occur at SSTC.

#### ELCAS/Pile Driving

Pile driving will be conducted during installation of the ELCAS which is constructed to provide a quick and temporary pier structure for offloading Navy vessels. Under the No Action Alternative, ELCAS activities occur twice a year and occur either bayside at Bravo Beach, or oceanside at SSTC-North. Pile installation occurs over a period of approximately 10 days. Approximately 101 piles are driven in a typical ELCAS training event, with around 250 to 300 impacts per pile, and each pile taking on average 10 minutes to install. At the end of the training, a vibratory hammer attached to the pile head will be used to remove piles. Removal takes approximately 15 minutes per pile over a period of around 3 days.

The methodology for assessing impacts of pile installation and removal during ELCAS training on marine mammals is discussed in Section 3.9.2.5. It describes NMFS established Level A and B harassment thresholds, the practical spreading loss model, and the methodology for estimating ZOIs and marine mammal exposures for ELCAS pile driving and removal.

Actual noise levels of ELCAS pile driving at SSTC depend on the type of hammer used, the size and material of the pile, and the substrate the piles are being driven into. Using known equipment, installation procedures, and applying certain constants derived from other west coast measured pile driving, predicted underwater sound levels from ELCAS pile driving can be calculated. The ELCAS uses 24-inch diameter hollow steel piles, installed using a diesel impact hammer to drive the piles into the sandy on-shore and near-shore substrate at SSTC. For a dock repair project in Rodeo, California in San Francisco Bay, RMS underwater sound level for a 24 inch steel pipe pile driven with a diesel impact hammer in less than 4.6 m (15 ft) of water depth was measured at 189 dB re 1uPa from approximately 10 m (33 ft) away. RMS sound level for the same type and size pile also driven with a diesel impact hammer, but in greater than 11.0 m (36 ft) of water depth, was measured to be 190 to 194 dB RMS during the Amoco Wharf repair project in Carquinez Straits, Martinez, California (CADOT 2009). The areas where these projects were conducted have a silty sand bottom with an underlying hard clay layer, which because of the extra effort required to drive into clay, would make these measured pile driving sound levels louder (more conservative) than they would if driving into SSTC's sandy substrate. Given the local bathymetry and smooth sloping sandy bottom at SSTC, ELCAS piles will be driven in water depths of 11 m (36 ft) or less. Therefore, for the purposes of this analysis, both the Rodeo repair project (189 RMS) and the low end of the measured values of the Amoco Wharf repair projects (190 RMS) are considered to be reasonably representative of sound levels that would be expected during ELCAS pile driving at SSTC.

Using an this estimated RMS measurement of 190 dB re 1uPa at 10 m (33 ft), the circular zone of influence (ZOI) surrounding a 24-inch steel diesel-driven pile can be estimated to have a radius of 1,094 yards for the Level B behavioral harassment threshold (160 RMS) and 46 yards for Level A injurious harassment for cetaceans (180 dB RMS) and 11 yards feet for Level A injurious harrassment for pinnipeds (190 dB RMS) (Table 3.9-7). It should be noted that ELCAS pier construction starts with piles being driven near the shore and extends offshore. Near the shore, the area of influence would be a semi-circle and towards the end of the ELCAS (approximately 1,200 feet from the shore) would be a full circle. The above calculated area of influence conservatively assumes that all ELCAS piles driven are all driven offshore at SSTC, producing a circular zone of influence.

Noise levels derived from piles removed via vibratory extractor are different than those driven with an impact hammer. Steel pilings and a vibratory driver were used for pile driving at the Port of Oakland (CADOT 2009). Underwater sound levels during this project for a 24-inch steel pile in 11 m (36 ft) of water depth was field measured to be 160 dB RMS. The area where this projects was conducted has a harder substrate, which because of the extra effort required to drive the pile, would make these measured pile driving sound levels louder (more conservative) than they would if driving into SSTC's sandy substrate. Conservatively using this RMS measurement for SSTC, the zone of influence (ZOI) for a 24-inch steel pile removed via a vibratory extractor out to the 120 dB RMS Level B behavioral harassment threshold can be estimated to be 5,076 feet (Table 3.9-7). Additionally, the distances to the 180 dB RMS Level A harassment threshold for cetaceans and the 190 dB RMS Level A harassment threshold for pinnipeds can be estimated as 1 yard and less than 1 yard, respectively. As discussed above, the above calculated area of influence conservatively assumes that all ELCAS piles driven are all driven offshore at SSTC, producing a circular zone of influence.

**Table 3.9-7: Maximum Zones of Influence for ELCAS Activities**

| | **Level B (Continuous noise)** | **Level B (Impulse)** | **Level A (Cetaceans)** | **Level A (Pinnipeds)** |
|---|---|---|---|---|
| | **120 dB RMS** | **160 dB RMS** | **180 dB RMS** | **190 dB RMS** |
| Installation (Pile Driving) | N/A | 1,094 yards | 46 yards | 11 yards |
| Removal (Vibratory) | 5,076 yards | N/A | 1 yard | < 1 yard |

Based on the assessments conducted, using the methodology discussed in Section 3.9.2.5, and without consideration of current mitigation measures, activities under the No Action Alternative are not anticipated to expose marine mammals to injury (Level A harassment). However, ELCAS activities could result in limited non-injurious (Level B) harassment to cetaceans and pinnipeds during pile removals. Specifically, 30 annual exposures are predicted from pile installation activities (20 bottlenose dolphins and 10 California sea lions), and 144 annual exposures (3 gray whales, 84 bottlenose dolphins, 51 california sea lions, and 6 harbor seals) from pile removal activities could result in Level B harassment (Table 3.9-8). As mentioned previously, these exposure modeling results are estimates of marine mammal ELCAS sound exposures without consideration of standard mitigation and monitoring procedures.

**Table 3.9-8: Estimates of Exposed Species to ELCAS Activities Without Implementation of Mitigation Measures: No Action Alternative**

| Species | | | NO ACTION ALTERNATIVE: Annual Estimated Mammals Exposure | | | |
|---|---|---|---|---|---|---|
| | | | Level B (Continuous) | Level B (Impulse) | Level A (Cetaceans) | Level A (Pinnipeds) |
| | | | 120 dB RMS | 160 dB RMS | 180 dB RMS | 190 dB RMS |
| Cetaceans | Gray Whale | Installation | N/A | 0 | 0 | 0 |
| | | Removal | 3 | N/A | 0 | 0 |
| | Coastal Bottlenose Dolphin | Installation | N/A | 20 | 0 | 0 |
| | | Removal | 84 | N/A | 0 | 0 |
| Pinnipeds | California Sea Lion | Installation | N/A | 10 | 0 | 0 |
| | | Removal | 51 | N/A | 0 | 0 |
| | Harbor Seal | Installation | N/A | 0 | 0 | 0 |
| | | Removal | 6 | N/A | 0 | 0 |
| **Total Exposures** | | | **144** | **30** | **0** | **0** |

As presented for underwater detonations, behavioral responses from exposure to ELCAS pile driving can range from no observable response to other behavioral responses discussed previously (Southall 2007, NOAA 2009). According to the severity scale response spectrum proposed by Southall et al. (2007), responses classified as from 0-3 are brief and minor, those from 4-6 have a higher potential to affect foraging, reproduction, or survival and those from 7-9 are likely to affect foraging, reproduction, and survival. While there is little data on the consequences of sound exposure on vital rates of marine mammals, given the limited duration of ELCAS training (<10 days), and the implementation of the current mitigation and monitoring procedures in the SSTC, as described in Section 3.9.2.7, potential for impacts to individual marine mammals or marine mammal stocks from ELCAS activities will be minimal.

### 3.9.2.8.5 Other Acoustic Sources

### Mine Location—Acoustic Pingers

To facilitate inert mine recovery, high-frequency (35 to 43 kHz) pingers are occasionally attached to mines. The source level of the acoustic pinger is 70 - 75 dB re 1 µPa-m and these high frequency sounds attenuate rapidly in seawater, so any behavioral effects on marine mammals would be localized if they occurred at all. These emissions were not included in the modeling so potential marine mammals exposures from these sources were not estimated. However, it is unlikely that effects to marine mammals from these sources would be significant because of the limited emission times, rapid attenuation rate of high-frequency sound, and the limited area affected by these sources. Location pingers for inert mines do not constitute an adverse effect on the physiology and behavior of marine mammals and are not carried forward in this EIS.

### Diver Recall Devices

Underwater exercises involving Navy divers include an underwater notification system alerting divers to return to boats or shore to conclude exercises. The noise associated with the Audible Recall Device (ARD) is broadband, though most energy is concentrated between 200 and 300 Hz. The duration of a diver recall device is one second or less and propagation models indicate that levels drop to below 2 psi·sec within 23 feet of the source. The ARD is only used at periodic intervals when needed to alert or recall underwater divers and do not represent a continuous acoustic source. Disturbance effects on the behavior of marine mammals, if any, would be extremely localized and short-term on the order of seconds to minutes. Potential avoidance behavior constitutes a minor and temporary change in behavior, with no adverse effect to overall behavior patterns. Therefore, recall devices are not carried forward in this EIS analysis.

### 3.9.2.9 Alternative 1 (Preferred Alternative)

Under Alternative 1, the Navy would increase the tempo of training, introduce new types of training activities, conduct existing routine training at additional locations within SSTC training areas, establish shallow water minefield, introduce new platforms and equipment, and increase access and availability to SSTC training areas. These components are discussed in detail in the following subsections.

#### 3.9.2.9.1 Underwater Detonations

Underwater detonations occur in shallow water (less than 72 feet) within oceanside training lanes and the shock waves propagate over a mostly homogeneous sand substrate. As presented in Section 3.8.2.2.3 (Table 3.8-10), underwater detonations would increase measurably from 103 activities under the No Action Alternative to 311 activities under Alternative 1. Under Alternative 1, five additional activities would be conducted: Shock Wave Generator (SWAG) (N1) and Unmanned Underwater Vehicle (UUV) Neutralization (N3), Airborne Mine Neutralization System (AMNS) (N7), Demolition Requalification and Training/Underwater Detonations (N9), and NSW Underwater Demolition Training (N11), and the footprint of activities would be expanded to include SWAG detonations of up to 15 grams Net Explosive Weight (NEW) within San Diego Bay (Table 2-2). Zones of exposure were estimated for the different charge weights, charge depths, water depths, and seasons. These ZOI calculated ranges are shown in Table 3.9-9.

Shock Wave Generator (N1, Table 2-2) is a new activity under Alternative 1 that will take place within all boat training lanes and the San Diego Bay training areas. SWAG is a tool used to disarm enemy limpet mines, which have been attached to the hull of a ship. Under Alternative 1, SWAG is expected to occur up to 90 times a year in the San Diego Bay and nearshore waters of SSTC boat lanes.

UUV Neutralization (N3) is a new activity under Alternative 1 that would be conducted within SSTC Boat Lanes 1-14. Training consists of placing sequential charges consisting of a Seafox (3.3 pounds) or Archerfish (3.57 pounds) charge placed from depths of 10 feet to the bottom in water depths less than 72 feet.

AMNS (N7) is a new activity under Alternative 1 that would be conducted within SSTC Boat Lanes 1-14 (Table 2-2). Training consists of deployment of AMNS underwater vehicle that searches for, locates, and destroys mines. The vehicle is self-propelled and unmanned. Ten of the 48 annual activities culminate in the AMNS being remotely detonated when it encounters a simulated (inert) mine shape. The 3.3 pound NEW charge (PBXN110) would be manually detonated.

Demolition Requalification and Training/Underwater Detonations (N9) is a new activity under Alternative 1 that would be conducted within all boat training lanes. Training consists of requalifying or training teams in underwater detonations by conducting detonations on metal plates near the shore. Additionally, at depths of 10 to 72 feet, two sequential 12.5 to 13.75-pound charges are placed on the bottom or a single 25.5-pound charge is placed from a depth of 20 feet to the bottom.

**Table 3.9-9: Maximum Zone of Influence for Underwater Detonation Activities Under Alternative 1.**

| Underwater Detonation Operation | Charge Weight Used[1] | Season | Level B Harrassment | Level A Harrassment | | Mortality |
|---|---|---|---|---|---|---|
| | | | Onset of TTS[2] / Non-TTS[3] (yards) | Onset of slight lung injury (13.0 psi-msec) (yards) | 50% TM rupture (205 dB re $1\mu Pa^2$-sec) (yards) | Onset of extensive lung injury (30.5 psi-msec) (yards) |
| Mine Countermeasures | 20 | Warm | 470 | 360 | 80 | 80 |
| | | Cold | 450 | 160 | 80 | 80 |
| Floating Mine | 5 | Warm | 240 | 20 | 80 | 20 |
| | | Cold | 260 | 20 | 80 | 20 |
| SWAG | 0.033 | Warm | 60 | 0 | 0 | 0 |
| | | Cold | 40 | 0 | 0 | 0 |
| Unmanned Underwater Vehicle Activities | 15 | Warm | 440 | 360 | 80 | 80 |
| | | Cold | 400 | 150 | 80 | 80 |
| Marine Mammal Systems Activities (sequential) | 29 | Warm | 420/740 | 360 | 140 | 90 |
| | | Cold | 470/650 | 170 | 140 | 90 |
| Marine Mammal Systems Activities (individual) | 29 | Warm | 400 | 360 | 100 | 90 |
| | | Cold | 490 | 170 | 100 | 90 |
| Dive Platoon (sequential) | 3.5 | Warm | 330/470 | 80 | 90 | 50 |
| | | Cold | 370/560 | 90 | 90 | 50 |
| Qual/Cert (sequential) | 13.75 | Warm | 330/470 | 140 | 100 | 80 |
| | | Cold | 370/530 | 140 | 100 | 80 |
| Qual/Cert (individual) | 25.5 | Warm | 420 | 300 | 90 | 90 |
| | | Cold | 470 | 170 | 90 | 90 |
| Mine Neutral (sequential) | 3.5 | Warm | 330/470 | 80 | 90 | 50 |
| | | Cold | 370/560 | 90 | 90 | 50 |
| UUV Neutral (sequential) | 3.57 | Warm | 220/260 | 80 | 60 | 50 |
| | | Cold | 230/280 | 90 | 60 | 50 |
| AMNS | 3.5 | Warm | 220 | 80 | 40 | 40 |
| | | Cold | 230 | 80 | 40 | 40 |

[1] Charge weights are listed in pounds
[2] Maximum ZOI based on greatest range from dual criteria (182 dB re $1\mu Pa^2$-sec or 23 psi)
[3] Behavioral Disruption Non-TTS (listed only for (sequential detonations)

NSW Underwater Demolition Training (N11) is a new activity under Alternative 1 that would be conducted within all training lanes. Up to 40 persons participate in the activity, which involves small groups swimming to shore from four inflatable boats located approximately 1,000 yards offshore; boats may be beached on shore. A single charge of less than 10 pounds of C-4 explosives (if detonated on the bottom) or less than five pounds (if within five feet of the surface) is command detonated near the shoreline in water less than 24 feet deep.

Based on the modeling approach applied, as discussed in Section 3.9.2.4 and without consideration for mitigation measures, underwater detonations under Alternative 1 would result in the potential for noninjurious (Level B) harassment to cetaceans and pinnipeds, but there would be no potential for injurious (Level A) harassment or mortality. The modeled explosive exposure numbers by species are presented in Table 3.9-10. Specifically, 153 annual exposures to pressure from underwater detonations would result in TTS (Level B harassment). Of these 153 exposures, 98 annual exposures would result in TTS for bottlenose dolphins. Exposures of California sea lions comprise the remaining 55 annual exposures that would result in TTS. Exposures to grey whales and harbor seals are not anticipated due to low species density and the limited zone of influence of the proposed underwater detonations. These exposure modeling results are estimates of marine mammal underwater detonation sound exposures without consideration of standard mitigation and monitoring procedures.

**Table 3.9-10: Modeled Estimates of Species Exposed to Underwater Detonations Without Implementation of Mitigation Measures under Alternative 1**

| Species | | | ALTERNATIVE 1: Season Average Mammals Exposure (All Sources) | | | |
|---|---|---|---|---|---|---|
| | | | Level B Behavior (MSE only) | Level B TTS | Level A Injury | Level A Mortality |
| | | | 177 dB | 182 dB / 23 psi | 205 dB / 13.0 psi-ms | 30.5 psi-ms |
| Cetaceans | Gray Whale | Warm | - | - | - | - |
| | | Cold | 0 | 0 | 0 | 0 |
| | Coastal Bottlenose Dolphin | Warm | 30 | 43 | 0 | 0 |
| | | Cold | 40 | 55 | 0 | 0 |
| Pinnipeds | California Sea Lion | Warm | 4 | 4 | 0 | 0 |
| | | Cold | 40 | 51 | 0 | 0 |
| | Harbor Seal | Warm | 0 | 0 | 0 | 0 |
| | | Cold | 0 | 0 | 0 | 0 |
| **Total Exposures** | | | **114** | **153** | **0** | **0** |

In addition to possible exposures that could result in TTS, the modeling without consideration of mitigation measures indicates that detonations under Alternative 1 also would result in the potential for 114 nonphysiological behavioral exposures. While physiological impacts were calculated for all activities, non-physiological behavioral impacts were calculated only for those exercises which involved multiple detonations during a training scenario. Coastal bottlenose dolphins were predicted to have a similar number of non-physiological behavioral exposures in both the warm (30) and cold (40) seasons, while California sea lions were predicted to have a higher number of non-physiological behavioral exposures during the cold season (40) than in the warm season (4). Modeling estimates indicate that no exposures of either coastal bottlenose dolphins or California sea lions exceeded injury criteria suggesting that risk of injury was low during a year of training at SSTC.

To reduce the potential for behavioral or physiological damage such as TTS or injury, a buffer zone would be established around each detonation area. As discussed in Section 3.9.3, the buffer zone for 24 to 72 feet of water depth would remain the same to accommodate the largest Level B behavioral harassment ZOI under Alternative 1 (MMS sequential detonations). The buffer zone for VSW underwater detonations (in zero to 24 feet of water), would also remain the same. Operations would not be conducted if marine mammals are sited in the buffer zone. This type of mitigation would likely prevent animals from being exposed to the loudest explosive effects that could potentially result in behavioral, TTS or PTS and more intense behavioral reactions. Implementation of current mitigation and monitoring procedures in the SSTC, as described in Section 3.9.1.7, would minimize the potential for marine mammal exposures to underwater detonations. With implementation of mitigation measures, it is anticipated that exposures will be primarily behavioral, and are highly unlikely to disrupt overall behavior patterns such as migrating, breeding, feeding and sheltering, of marine mammals in the ROI.

#### 3.9.2.9.2 Aircraft Activities

Implementation of Alternative 1 would result in similar effects to marine mammals as previously described under the No Action Alternative. The types of air activities proposed for Alternative 1 are consistent with those described under the No Action Alternative, although the frequency would increase and five new activities would be conducted (N4-N8, Table 2-2). As presented in Chapter 2 (Table 2-2 and 2-3) and detailed in Appendix C, helicopter activities over San Diego Bay and ocean waters within the ROI would more than double under Alternative 1 as compared to the No Action Alternative. Helicopter activities would have the greatest impact because of the low flying and hovering at altitudes down to 100 feet. Disturbance of marine mammals from the noise, physical presence, or sea surface disturbance from aircraft within the ROI would be limited to animals utilizing the area immediately adjacent to the activity and likely only within upper-most section of the water column. Any temporary effect to marine mammals near the surface remains a low probability considering the temporal variability of both training actions and the potential for marine mammals to be present near the sea surface within a specific training area. It is likely that few animals would be in the area and those approaching the area would avoid it if aircraft activities are being conducted. Therefore, there would be minimal effects to marine mammals from aircraft activities as a result of implementation of Alternative 1 and these effects are highly unlikely to disrupt overall behavior patterns such as migrating, breeding, feeding and sheltering, of marine mammals in the ROI.

In addition, one new air activity utilizing helicopters with a mounted Light Detection and Ranging (LIDAR) blue-green laser used to detect, classify, and localized floating and near-surface mines in shallow water (N5) would be added under Alternative 1 (Table 2-2). Zorn et al. (1998) collected information about current laser safety standards and investigated retinal damage mechanisms for humans, and research on eye anatomy for humans, cetaceans, and pinnipeds in an attempt to determine laser safety thresholds for cetaceans and pinnipeds. Zorn et al. developed a sensitivity ratio to compare the human eye sensitivity to that of marine mammals and concluded that the human eye is more sensitive to laser radiation than either the cetacean eye or the pinniped eye.

Cetaceans and pinnipeds have adapted to living in bright sunlight and dark ocean waters. In bright light, a highly constricted pupil keeps the received energy levels down, while in darker conditions, a pupil can be fully opened to admit as much light as possible. It is unlikely an animal would have fully dilated pupils at the surface, especially during daylight hours. If marine mammals were directly illuminated by a LIDAR source, this highly constricted pupil would further reduce the received energy, as Airborne Laser Mine Detection System activities are restricted to daylight hours. Although the likelihood that an oceanographic LIDAR's laser beam would directly contact a cetacean or pinniped eye is unknown, both cetaceans and pinnipeds spend a significant amount of time underwater and are widely scattered at sea. Large groupings at sea are easy to spot and would be avoided by helicopter operators. Combining this information with the low number of annual activities, temporal variability of training actions, lower sensitivity to laser radiation, low potential for marine mammals to be present near or at the sea surface within a specific training area, and the low probability of direct eye contact of a moving LIDAR laser, the use of LIDAR poses a minimal risk to marine mammals.

### 3.9.2.9.3 Marine Vessels

Marine vessels increase in use and scope under Alternative 1 compared to the No Action Alternative. Increases to on water activity by marine vessels in both ocean and San Diego Bay training areas would increase the probability of effect on marine mammals from disturbance and physical injury, though the anticipated level of impact from these activities is expected to remain low. The greatest increases to marine vessel activities would be attributed to new activities, SWAG (N1) and Surf Zone Test Detachment (N2), as well as increases to existing activities, SDV/ASDS Cert training and Barge Ferry/Causeway Coxswain training (Table 2-2)**.**

### 3.9.2.9.4 Amphibious and Beach Activities

### ELCAS/Pile Driving

Under Alternative 1, the number of ELCAS events will increase from two to four activities annually. The training locations, pile driver, and pile type and size would remain the same as in the No Action Alternative. As such, the ZOIs shown in Table 3.9-7 for pile driving would also be the same as in the No Action Alternative.

Based on assessments conducted (discussed in Section 3.9.2.5), and without consideration of current mitigation measures, activities under Alternative 1 are not expected to cause injury (Level A harassment) to marine mammals. However, ELCAS installation could result in behavioral (Level B) harassment to 60 cetaceans and pinnipeds (40 bottlenose dolphins and 20 California sea lions, Table 3.9-11). Also, pile removal activities could result in behavioral (Level B) harassment to 288 cetaceans and pinnipeds (6 gray whales, 168 bottlenose dolphins, 102 California sea lions, and 12 harbor seals). As mentioned previously, these exposure modeling results are estimates of marine mammal ELCAS sound exposures without consideration of standard mitigation and monitoring procedures.

The available scientific literature suggest that introduction of pile driving into the marine environment could result in short term behavioral and/or physiological marine mammal impacts such as: altered headings; increased swimming rates; changes in dive, surfacing, respiration, feeding, and vocalization patterns; masking; and hormonal stress production (Southall et al., 2007); however, some field studies also suggest marine mammals do not observably respond to construction type sounds such as drilling (e.g., Richardson et al. 1995; Moulton et al., 2005). Individual animal responses are likely to be highly variable depending on situational state, and prior experience or habituation. Southall et al. 2007 point out that careful distinction must be made of brief minor, biologically unimportant reactions as compared to profound, sustained or biologically meaningful responses related to growth, survival, and reproduction. Populations of bottlenose dolphins, California sea lions, and harbor seals in and adjacent to San Diego Bay and SSTC have likely been historically exposed and potentially habituated to multiple regional anthropogenic underwater noise sources (i.e., commercial shipping, recreational boating, in-water construction, aircraft overflights, etc.).

**Table 3.9-11: Estimates of Exposed Species to ELCAS Activities Without Implementation of Mitigation Measures under Alternative 1**

| Species | | | Annual Estimated Mammals Exposure | | | |
|---|---|---|---|---|---|---|
| | | | Level B (Continuous) | Level B (Impulse) | Level A (Cetaceans) | Level A (Pinnipeds) |
| | | | 120 dB RMS | 160 dB RMS | 180 dB RMS | 190 dB RMS |
| Cetaceans | Gray Whale | Installation | N/A | 0 | 0 | 0 |
| | | Removal | 6 | N/A | 0 | 0 |
| | Coastal Bottlenose Dolphin | Installation | N/A | 40 | 0 | 0 |
| | | Removal | 168 | N/A | 0 | 0 |
| Pinnipeds | California Sea Lion | Installation | N/A | 20 | 0 | 0 |
| | | Removal | 102 | N/A | 0 | 0 |
| | Harbor Seal | Installation | N/A | 0 | 0 | 0 |
| | | Removal | 12 | N/A | 0 | 0 |
| **Total Exposures** | | | **288** | **60** | **0** | **0** |

The implementation of the current mitigation and monitoring procedures in the SSTC, as described in Section 3.9.2.7, will minimize the potential for impacts to individual marine mammals or marine mammal stocks from ELCAS activities.

### 3.9.2.9.5 Other Acoustic Sources

Two activities are proposed under Alternative 1 that introduce an additional source of high-frequency noise into the marine environment. UUV Neutralization and AN/AQS-20 Mine Hunting (N3 and N4) introduce high-frequency sidescan sonars, which are operated at frequencies greater than 200 kHz. It is important to note that, as a group, marine mammals have functional hearing ranging from 10 Hertz (Hz) to 180 kHz; however, their best hearing sensitivities are well below that level. Since sonar sources operating at 180 kHz or higher attenuate rapidly and are at or outside the upper frequency limit of even the ultrasonic species of marine mammals, further consideration and modeling of these higher frequency acoustic sources are not warranted.

### 3.9.2.10 Alternative 2

Implementation of Alternative 2 would increase the total operational training tempo to the same levels as presented for Alternative 1 (Table 2-2 and 2-3). Similar to Alternative 1, Alternative 2 would include the introduction of new types of training; conducting existing routine training at additional locations within SSTC established training areas, and increasing access to and availability of existing beach and inland training areas. The only difference between Alternative 1 and 2 is that all SSTC-N oceanside beach training areas would be available for use, regardless of time of year. Since the differences between Alternative 1 and Alternative 2 are terrestrial, the impacts associated with Alternative 2 would be the same as those described above for Alternative 1.

### 3.9.3 Proposed Mitigation Measures

Given implementation of the current mitigation measures for SSTC activities (described in detail in Section 3.9.1.7), there would be minimal impacts to marine mammals under any of the alternative actions considered in this EIS.

Mitigation measures for oceanside underwater detonations would remain the same as described in Section 3.9.1.7.

In addition, the Navy would implement mitigation measures for underwater detonations involving SWAG, which are proposed in Alternative 1 and 2, but are not currently conducted. Mitigation measures for SWAG detonation training are described below. Similar to existing mitigation measures, the physical topography, the lack of protected species on the range, and the type of Navy training routines allow for exceptionally reliable and effective mitigation procedures. Marine mammal species can be detected within a radius that extends out to the distance at which only the lowest degree of TTS would be expected to occur. That is, the procedures described in this section mitigate the potential for Level A harassment by injury and Level B harassment associated with TTS since explosives are not detonated when protected species are in the area associated with those effects. Mysticetes and large odontocetes are rarely, if ever, present in the shallow offshore waters of the SSTC. Were large marine mammals to approach the area—even far beyond the buffer zone—they would be immediately obvious to the shore or safety-boat observers. The SSTC ROI is not known to be a preferred feeding site for small marine mammals. Thus, the principal concern is for protection of small odontocetes (dolphins and small whales) and carnivora (sea lions) that only occasionally transit though the site. It follows that the buffer zones, to be described below, are determined by modeled estimates of the propagated peak-pressure and energy.

The following mitigation measures are consistent with existing training objectives and activities as well as established human safety procedures. In case of unanticipated conflict, human safety considerations will take precedence and such conflicts are always used to make incremental improvements in the procedures used in subsequent activities.

For SWAG charges laid bayside on SSTC at the locations described:

1. A buffer zone of 180 feet will be established around each SWAG detonation point.
2. Observer(s) with binoculars and small craft will survey the detonation area and the buffer zone for marine mammals from at least 10 minutes prior to commencement of the scheduled explosive event until at least 10 minutes after detonation. Observers will pay extra attention within the buffer zone to large amounts of floating kelp strands and other marine debris (if any), since these may provide shelter and food for marine mammal prey.
3. Divers placing charges on mines and dive support vessels will check the area immediately around the mine location for marine mammals.
4. If a marine mammal is sighted within the buffer zone or moving towards it, exercises will be suspended until the animal has voluntarily left the area and the area is clear of sea turtles and marine mammals for at least 10 minutes.
5. Immediately following the detonation, visual monitoring for marine mammals within the buffer zone will continue for 10 minutes. Any animals appearing will be observed for signs of injury. Injured marine mammals will be reported to the CNRSW Environmental Director, the PACFLT Environmental Office, and NMFS.

Mitigation for ELCAS/Pile Driving Activities on SSTC oceanside:

The Navy proposes, under the associated SSTC marine mammal monitoring plan, to conduct underwater acoustic propagation monitoring during the first available ELCAS deployment at the SSTC under the Incidental Harassment Authorization application. This acoustic monitoring would provide empirical field data on ELCAS pile driving and removal underwater source levels, and propagation specific to ELCAS training at the SSTC. These results will be used to either confirm or refine the Navy's exposure predictions.

### 3.9.4 Impacts to Marine Mammal Species or Stocks

Overall, the conclusions in this analysis find that impacts to marine mammal species and stocks would be negligible for the following reasons:

- Acoustic harassments are within the non-injurious temporary threshold shift (TTS) or behavioral effects zones (Level B harassment). There are no exposures to sound levels or pressure that could cause permanent threshold shift (PTS)/injury (Level A harassment) resulting from the summation of the modeling.
- Although the numbers presented for the No Action Alternative (Table 3.9-6 and 3.9-8), Alternative 1 and Alternative 2 (Table 3.9-10 and 3.9-11) represent estimated harassment under the Marine Mammal Protection Act (MMPA), as described above, they are likely overestimates of harassment, primarily by behavioral disturbance. In addition, the model calculates harassment without taking into consideration standard mitigation measures, and is not indicative of a likelihood of either injury or harm.
- Additionally, the mitigation measures described in Section 3.9.1.7 and Section 3.9.3 are designed to reduce sound exposure of marine mammals to levels below those that may cause "behavioral disruptions" and to achieve the least practicable adverse effect on marine mammal species or stocks.

Consideration of negligible impact is required for NMFS to authorize incidental take of marine mammals. By definition, an activity has a "negligible impact" on a species or stock when it is determined that the total taking is not likely to reduce annual rates of adult survival or recruitment (i.e., offspring survival, birth rates). Using each species' life history information, the expected behavioral patterns in the SSTC training and exercise locations, and an analysis of the behavioral disturbance levels in comparison to the overall population presented for each species, these species-specific analyses support the conclusion that proposed SSTC training events would have a negligible impact on marine mammal populations.

### 3.9.5 Unavoidable Adverse Environmental Effects

There are no unavoidable adverse environmental effects on marine mammals. Implementation of protective measures minimizes any adverse impacts associated with SSTC training activities.

### 3.9.6 Summary of Effects

Modeling estimates for the No Action Alternative indicate that no exposures would result in slight injury, severe injury, or mortality of any marine mammal. Without implementation of current mitigation measures, 78 annual exposures to pressure from underwater detonations could result in TTS and 68 annual exposures could result in nonphysiological behavioral exposures (Level B harassments). In addition, 30 annual exposures (20 bottlenose dolphins, 10 harbor seals) from pile installation activities and 144 annual exposures (3 gray whales, 84 bottlenose dolphins, 51 California sea lions, and 6 harbor seals) pile removal activities could result in Level B harassment. However, implementation of the current mitigation measures will minimize the potential impacts to marine mammal species in the SSTC and the remaining potential impacts are highly unlikely to disrupt overall behavior patterns such as migrating, breeding, feeding and sheltering, of marine mammals in the ROI.

Modeling estimates for Alternatives 1 and 2 indicate that without implementation of current mitigation measures, 153 annual exposures to pressure from underwater detonations could result in TTS and 114 annual exposures could result in nonphysiological behavioral exposures (Level B harassments). In addition, 60 annual exposures (30 bottlenose dolphins, 20 harbor seals) from pile installation activities and 288 annual exposures (6 gray whales, 168 bottlenose dolphins, 102 California sea lions, and 12 harbor seals) pile removal activities could result in Level B harassment. No exposures would result in slight injury, severe injury, or mortality. However, implementation of the current mitigation measures will minimize the potential impacts to marine mammal species in the SSTC.

Based on the above analysis, the Navy has submitted an application for an Incidental Harassment Authorization to NMFS per the requirements of MMPA for proposed training activities that have the potential to incidentally take marine mammals as listed above. The Navy received comments from NMFS on the IHA request on September 9, 2010 and submitted the Final IHA request to NMFS on September 15, 2010. The Notice of Receipt of the IHA application was published in the Federal Register by NMFS on October 19, 2010. After consideration of public comments on the IHA application, NMFS may grant the authorization to take small numbers of marine mammals by harassment if it finds that the taking will have a negligible impact on the species or stock(s) on subsistence uses (where relevant). NMFS will identify appropriate mitigation, monitoring and reporting requirements. Chapter 6 provides a full description of the IHA process and Appendix G provides a list of the Silver Strand Training Complex (SSTC) IHA documentation. Agency correspondence and supporting documentation can be found on the SSTC EIS website at www.silverstrandtrainingcomplexeis.com.

Table 3.9-12 presents a summary of effects and mitigation measures for the No Action Alternative, Alternative 1, and Alternative 2.

**Table 3.9-12: Summary of Effects**

| Alternative | Effects |
|---|---|
| **No Action Alternative** | • Modeling estimates for the No Action Alternative indicate that exposures are not expected to result in slight injury, severe injury, or mortality of marine mammals. Without implementation of current mitigation measures, underwater detonations could result in behavioral and TTS (Level B) harassment exposures. 78 annual exposures to pressure from underwater detonations could result in TTS and 68 annual exposures could result in nonphysiological behavioral exposures (Level B harassments). In addition, 30 annual exposures (20 bottlenose dolphins, 10 harbor seals) from pile installation activities and 144 annual exposures (3 gray whales, 84 bottlenose dolphins, 51 California sea lions, and 6 harbor seals) pile removal activities could result in Level B harassment. No exposures are expected to result in injury, severe injury, or mortality.<br>• Implementation of current mitigation measures minimizes potential impacts to marine mammal species in the SSTC ROI.<br>• Ship collisions are unlikely due to the low density of marine mammals in the area. |
| **Alternative 1** | • Modeling estimates for Alternative 1 indicate that without implementation of current mitigation measures, an increased tempo of underwater detonations and could result in an increase of behavioral and TTS (Level B) harassment. 153 annual exposures to pressure from underwater detonations could result in TTS and 114 annual exposures could result in nonphysiological behavioral exposures (Level B harassments). In addition, 60 annual exposures (30 bottlenose dolphins, 20 harbor seals) from pile installation activities and 288 annual exposures (6 gray whales, 168 bottlenose dolphins, 102 California sea lions, and 12 harbor seals) pile removal activities could result in Level B harassment. No exposures are expected to result in slight injury, severe injury, or mortality.<br>• Implementation of current mitigation measures would minimize potential impacts to marine mammal species in the SSTC ROI.<br>• Ship collisions are unlikely due to the low density of marine mammals in the area.<br>• Effects from other activities are the same as described under the No Action Alternative. |
| **Alternative 2** | • With implementation of current mitigation measures, effects are the same as described under Alternative 1. |
| **Mitigation** | Mitigation measures for very shallow water (VSW) underwater detonations on SSTC oceanside (0-24 feet):<br>• Easily visible anchored floats will be positioned on a 1,200 foot or 400 yard radius of a roughly semi-circular zone (the shoreward half being bounded by shoreline and immediate off-shore water) around the detonation location for small explosive exercises at the SSTC. These mark the outer limits of the mitigation zone. |

**Table 3.9-12: Summary of Effects (Continued)**

| Alternative | Effects |
|---|---|
| **Mitigation (Continued)** | • For each VSW underwater detonation event, a safety-boat with a minimum of one observer is launched 30 or more minutes prior to detonation and moves through the area around the detonation site. The task of the safety observer is to exclude humans from coming into the area and to augment a shore observer's visual search of the mitigation zone for marine mammals. The safety-boat observer is in constant radio communication with the exercise coordinator and shore observer discussed below.<br>• A shore-based observer will also be deployed for VSW detonations in addition to boat based observers. The shore observer will indicate that the area is clear of marine mammals after 10 or more minutes of continuous observation with no marine mammals having been seen in the mitigation zone (1,200 feet or 400 yards) or moving toward it.<br>• At least 10 minutes prior to the planned initiation of the detonation event-sequence, the shore observer, on an elevated on-shore position, begins a continuous visual search with binoculars of the mitigation zone. At this time, the safety-boat observer informs the shore observer if any marine mammal has been seen in the zone and, together, both search the surface within and beyond the mitigation zone for marine mammals (and other protected species such as sea turtles).<br>• The observers (boat and shore based) will indicate that the area is not clear any time a marine mammal is sited in the mitigation zone or moving toward it and, subsequently, indicate that the area is clear of marine mammals when the animal is out and moving away and no other marine mammals have been sited.<br>• Initiation of the detonation sequence will only began on final receipt of an indication from the shore observer that the area is clear of marine mammals and will be postponed on receipt of an indication from that any observer that the area is not clear of marine mammals.<br>• Following the detonation, visual monitoring of the mitigation zone continues for 30 minutes for the appearance of any marine mammal in the zone. Any marine mammal appearing in the area will be observed for signs of possible injury.<br>• Any marine mammal observed after an VSW underwater detonation either injured or exhibiting signs of distress will be reported to Navy environmental representatives from the regional Navy shore commander (Commander, Navy Region Southwest) and U.S. Pacific Fleet, Environmental Office, San Diego Detachment. The Navy will report these events to the Stranding Coordinator of NMFS' Southwest Regional Office using Marine Mammal Stranding communication trees and contact procedures established for the Southern California Range Complex. These voice or email reports will contain the date and time of the sighting, location (or if precise latitude and longitude is not currently available, then the approximate location in reference to an established SSTC beach feature), species description (if known), and indication of the animal's status. |

**Table 3.9-12: Summary of Effects (Continued)**

| Alternative | Effects |
|---|---|
| **Mitigation (Continued)** | Mitigation measures for shallow water underwater detonations on SSTC oceanside (24-72 feet):<br>• A mitigation zone of 1,500 feet or 500 yards will be established around each underwater detonation point. This mitigation zone is based on the maximum range to onset-TTS (either 23 psi or 182 dB).<br>• A minimum of two boats, including but not limited to small zodiacs and 11-meter Rigid Hulled Inflatable Boats (RHIB) will be deployed. One boat will act as an observer platform, while the other boat is typically the diver support boat.<br>• Two observers with binoculars on one small craft\boat will survey the detonation area and the mitigation zone for marine mammals from at least 30 minutes prior to commencement of the scheduled explosive event and until at least 30 minutes after detonation.<br>• In addition to the dedicated observers, all divers and boat operators engaged in detonation events can potentially monitor the area immediately surrounding the point of detonation for marine mammals (and other protected species such as sea turtles).<br>• If a marine mammal is sighted within the 1,500 foot or 500 yard mitigation zone or moving towards it, underwater detonation events will be suspended until the marine mammal has voluntarily left the area and the area is clear of marine mammals for at least 30 minutes.<br>• Immediately following the detonation, visual monitoring for marine mammals within the mitigation zone will continue for 30 minutes. Any marine mammal observed after an underwater detonation either injured or exhibiting signs of distress will be reported to Navy environmental representatives from the regional Navy shore commander (Commander, Navy Region Southwest) and U.S. Pacific Fleet, Environmental Office, San Diego Detachment. The Navy will report these events to the Stranding Coordinator of NMFS' Southwest Regional Office using Marine Mammal Stranding communication trees and contact procedures established for the Southern California Range Complex. These voice or email reports will contain the date and time of the sighting, location (or if precise latitude and longitude is not currently available, then the approximate location in reference to an established SSTC beach feature), species description (if known), and indication of the animal's status.<br><br>Mitigation for ELCAS/Pile Driving Activities on SSTC oceanside:<br>• A mitigation zone will be established at 150 feet or 50 yards from ELCAS pile driving and pile removal events. This mitigation zone is base on the predicted range to Level A harassment (180 dB RMS) for cetaceans, and is being applied conservatively to both cetaceans and pinnipeds.<br>• Monitoring will be conducted within the 150 foot or 50 yard mitigation zone surrounding ELCAS pile driving and removal events for the presence of marine mammals (and other protected species such as sea turtles) before, during, and after pile driving and removal events<br>• If marine mammals are found within the 150 foot or 50 yard mitigation zone, pile removal events will be halted until the marine mammals (or sea turtles) have voluntarily left the mitigation zone. |

**Table 3.9-12: Summary of Effects (Continued)**

| Alternative | Effects |
|---|---|
| **Mitigation (Continued)** | • Monitoring for marine mammals (or sea turtles) will take place concurrent with pile removal events and 30 minutes prior to pile driving and removal commencement. A minimum of one trained observer will be placed on shore, on the ELCAS, or in a boat at the best vantage point(s) practicable to monitor for marine mammals.<br>• Monitoring observer(s) will implement shut–down/delay procedures when applicable by calling for shut–down to the hammer operator when marine mammals (or sea turtles) are sighted within the mitigation zone.<br>• Soft Start - Providing additional protection for marine mammals (and sea turtles), ELCAS pile driving includes a soft start as part of normal construction procedures. The pile driver increases impact strength as resistance goes up. At first, the pile driver piston drops a few inches. As resistance goes up, the pile driver piston will drop from a higher distance thus providing more impact due to gravity. This will allow marine mammals in the project area to vacate or begin vacating the area minimizing potential harassment. The ELCAS soft start is not the traditional soft-start used in bigger civilian construction projects, and doesn't include a waiting period (an initial set of several strikes from the impact hammer at 40-60 percent energy levels, followed by a one minute waiting period, then two subsequent 3 strike sets), but does provide additional time for marine mammals to vacate the area. Including waiting periods as part of training would be inconsistent with Navy training objectives that requires the ELCAS to be constructed as quickly as possible in real world conditions to ensure rapid supply of equipment and materials to shore in a hostile territory during wartime, or during humanitarian assistance operations.<br><br>For underwater detonations on SSTC oceanside under Alternative 1 and 2:<br>• The buffer for very shallow water detonations (0 to 24 feet of water) and for shallow water detonations (in 24 to 72 feet of water) will be the same as described for the No Action Alternative.<br><br>For SWAG charges laid bayside on SSTC under Alternative 1 and 2:<br>• A buffer zone of 180 feet will be established around each SWAG detonation point.<br>• Observer(s) with binoculars and small craft will survey the detonation area and the buffer zone for marine mammals from at least 10 minutes prior to commencement of the scheduled explosive event until at least 10 minutes after detonation. Observers will pay extra attention within the buffer zone to large amounts of floating kelp strands and other marine debris (if any), since these may provide shelter and food for marine mammal prey.<br>• Divers placing charges on mines and dive support vessels will check the area immediately around the mine location for marine mammals.<br>• If a marine mammal is sighted within the buffer zone or moving towards it, exercises will be suspended until the animal has voluntarily left the area and the area is clear of sea turtles and marine mammals for at least 10 minutes. |

**Table 3.9-12: Summary of Effects (Continued)**

| Alternative | Effects |
|---|---|
| **Mitigation (Continued)** | • Immediately following the detonation, visual monitoring for marine mammals within the buffer zone will continue for 10 minutes. Any animals appearing will be observed for signs of injury. Injured marine mammals will be reported to the CNRSW Environmental Director, the PACFLT Environmental Office, and NMFS.<br>Mitigation for ELCAS/Pile Driving Activities on SSTC oceanside:<br>• The Navy proposes, under the associated SSTC marine mammal monitoring plan, to conduct underwater acoustic propagation monitoring during the first available ELCAS deployment at the SSTC under the Incidental Harassment Authorization application. This acoustic monitoring would provide empirical field data on ELCAS pile driving and removal underwater source levels, and propagation specific to ELCAS training at the SSTC. These results will be used to either confirm or refine the Navy's exposure predictions. |

# 3.10 Sea Turtles

# 3.10 SEA TURTLES

## 3.10.1 Affected Environment

### 3.10.1.1 Introduction

#### 3.10.1.1.1 Definition

Sea turtles are long-lived reptiles that can be found throughout the world's tropical, subtropical, and temperate seas (Caribbean Conservation Corporation and Sea Turtle Survival League 2003). There are seven living species of sea turtles from two distinct families: the Cheloniidae (hardshelled sea turtles; six species), and the Dermochelyidae (leatherback turtle; one species). These two families can be distinguished from one another on the basis of their carapace (upper shell) and other morphological features.

Over the last few centuries, sea turtle populations have declined dramatically due to anthropogenic (human-related) activities such as coastal development, oil exploration, commercial fishing, marine-based recreation, pollution, and overharvesting (Eckert 1995). As a result, all six species of sea turtles found in United States (U.S.) waters are listed as either threatened or endangered under the Endangered Species Act (ESA).

Sea turtles are highly adapted for life in the marine environment. Sea turtles possess powerful, modified forelimbs (or flippers) that enable them to swim continuously for extended periods of time (Wyneken 1997), unlike terrestrial and freshwater turtles. They also have compact and streamlined bodies that help to reduce drag. Additionally, sea turtles are among the longest and deepest diving of the air-breathing vertebrates, spending as little as 3 to 6 percent of their time at the water's surface (Lutcavage and Lutz 1997). Sea turtles often travel thousands of miles between their nesting beaches and feeding grounds, which makes their adaptations very important (Ernst et al. 1994; Meylan 1995).

Although they are specialized for life at sea, sea turtles begin their lives on land. Aside from this brief terrestrial period, which lasts approximately 8 to 10 weeks as eggs and an additional few minutes to a few hours as hatchlings scrambling to the surf, sea turtles are rarely encountered out of the water. Sexually mature females return to land in order to nest, while certain species in the Hawaiian Islands, Australia, and the Galapagos Islands haul-out on land in order to bask (Carr 1995; Spotila et al. 1997). Sea turtles bask to thermoregulate, elude predators, avoid mating; and possibly to accelerate the development of their eggs, accelerate their metabolism, and destroy aquatic algae growth on their carapaces (Whittow and Balazs 1982; Spotila et al. 1997).

Female sea turtles nest in tropical, subtropical, and warm-temperate latitudes, often in the same region or on the same beach where they hatched (Miller 1997). Upon selecting a suitable nesting beach, most sea turtles renest in proximity during subsequent nesting attempts. The leatherback turtle diverges from this pattern. This species nests primarily on beaches with little reef or rock offshore, where erosion reduces the probability of nest survival. To compensate, leatherbacks scatter their nests over larger geographic areas and lay, on average, two times as many clutches as other species (Eckert 1987).

Four species of sea turtles have been reported in the Southern California Bight (SCB) (National Marine Fisheries Service and U.S. Fish and Wildlife Service) [NMFS and USFWS] 1998a, 1998d, 1998e, 1998f). The east Pacific green sea turtle (*Chelonia mydas*), the loggerhead sea turtle (*Caretta caretta*), and the olive ridley sea turtle (*Lepodochelys olivacea*) are members of the family Cheloniidae; the leatherback sea turtle (*Dermochelys coriacea*) is the sole living species of the Dermochelidae family. None of the four species is known to nest on southern California beaches. Nesting by olive ridley turtles occurs along the Pacific coast of Baja California Sur, which is the northernmost known nesting site in the eastern north Pacific (Fritts et al. 1982; Sarti-M. et al. 1996; NMFS 1998f, López-Castro et al. 2000). Due to the oceanic distributions of the leatherback, loggerhead, and olive ridley turtles off southern California, the coastal waters of the Pacific Ocean are designated as an area of primary occurrence for all sea turtle species (NMFS 1998a, 1998 b, 1998c, 1998d, 1998e, 1998f), although their presence within southern California is considered rare, with the exception of south San Diego Bay.

The leatherback turtles found off the U.S. west coast migrate from the western north Pacific (Indochina and Papua New Guinea) or from eastern north Pacific nesting beaches (Central America and Mexico) and are predominantly a pelagic species that forages in productive coastal waters north of Point Conception, California or off the coast of Peru and Chile. Stinson (1984) has provided evidence that most of the leatherbacks in northern California and Oregon enter the coastal zone in July from offshore in association with the 13º to 15ºC isotherms. The arrival of these turtles is associated with the arrival and occurrence of the 18º to 20ºC isotherms not characteristic of the coastal regions near Silver Strand Training Complex (SSTC) during late spring and early summer when loggerhead turtles are found off the U.S. west coast migrating from nesting beaches in Japan.

This section discusses the east Pacific green, loggerhead, leatherback and olive ridley sea turtles for the purpose of comparing environmental consequences of the Proposed Action and alternatives.

### 3.10.1.1.2 Regional Setting

The offshore project area is part of the Pacific Ocean region referred to as the SCB. The colder, more northerly California Current and the southern, warm-water, California Counter Current influence the water of SCB. These two currents mix in the Santa Barbara Channel. The waters of the southern SCB are higher in temperature and salinity than those of the northern portion (Hickey 1993). These differing conditions, as well as upwelling of cooler, nutrient-rich waters, influence the unusually diverse marine biota within the SCB region (Murray and Littler 1981).

San Diego Bay is a naturally formed, crescent-shaped embayment. It is separated from the Pacific Ocean by the Silver Strand peninsula, a long, narrow sand spit, which extends from the City of Imperial Beach to North Island. From the mouth of Otay River to the tip of Point Loma, San Diego Bay is about 15 miles long.

### 3.10.1.1.3 Region of Influence

The only turtle found in San Diego Bay waters is the east Pacific green sea turtle (Macdonald et al. 1990). This species is found in warm waters throughout the world, where the turtles follow the 18°C isotherm temperatures in the ocean (Eckert 2002); San Diego Bay represents the one turtles’ northernmost dwelling habitat. None of the four species of sea turtles reported along the west coast of the United States nest there. Nesting grounds are in Mexico, Central America, and various Pacific islands. Neither the loggerhead nor olive ridley sea turtle are expected to be present in San Diego Bay; but potentially, either species could occur offshore in extremely low numbers.

The marine region of Influence (ROI) can be partitioned into three zones: the bayside training zones within the San Diego Bay (sandy beaches, mudflats, and the nearshore environment); portions of the intertidal to nearshore (<0.5 nautical miles [nm]) ocean area off the southern beaches of Naval Air Station, North Island (NASNI); and the intertidal to nearshore (<3 nm) ocean area encompassing the training lanes at SSTC-N and SSTC-S, and ocean anchorages.

### 3.10.1.2 Threatened and Endangered Species

#### 3.10.1.2.1 Loggerhead Sea Turtle

The loggerhead sea turtle is listed as threatened under the ESA, and the population appears to be declining. Loggerheads occur worldwide in tropical to temperate waters. Although they are rare in this area, they have been reported from Alaska to Chile, with thousands being seen off Baja California (Pitman 1990); they do not appear to nest in the eastern or central Pacific. Most loggerhead sightings were reported off Baja California, with the largest concentrations sited off the coast of Bahia Magdalena. Strandings and sightings along the west coast have been in southern California; although, a few sightings were reported off Washington (Hodge 1982). Due to their presence around the SCB, loggerheads could be expected to appear in the ROI.

Juvenile loggerheads have been reported year-round off southern California (Guess 1981a, b; Stinson 1984). These may represent the northern range limits of a much larger population of juveniles present off the west coast of Baja California (Pitman 1990). Both adults and juveniles are most often seen from July through September (Stinson 1984), although sightings are not common; in fact, adults are rarely seen. Sightings are more frequent during El Niño events, reflecting the preference that cheloniids have for warmer waters. During the period 1988 through 2008, six strandings of loggerhead turtles were reported in San Diego County, two were determined to be entrainment related, two marine debris related, and the remaining two were undetermined (NMFS 2009).

Loggerheads prey on benthic invertebrates; but fish and plants are also eaten. Juveniles off Baja California eat pelagic red crabs (*Pleuroncodes planipes*) (NMFS 1998e).

#### 3.10.1.2.2 Olive Ridley Sea Turtle

The olive ridley sea turtle are globally listed as threatened under the ESA except for the Pacific coast of Mexico's breeding population, which is listed as endangered. The stock is declining, even though the olive ridley sea turtle is considered the most abundant sea turtle in the world. Clifton et al. (1982) estimated that the olive ridley Mexican breeding population off the Pacific coast of Mexico numbered over 10,000,000. Though the practice has been discontinued, in 1968 alone, over 1,000,000 olive ridleys were harvested in Mexico (Carr 1972).

The olive ridley sea turtle is found around the world in tropical to temperate waters. The usual range of the eastern Pacific olive ridley is from Baja California to Peru, within 1,200 nm of shore (NMFS 1998e). Stinson (1984) reported only ten sightings of this species north of Baja California (29º 45' N) and considered it rare off southern California. Juveniles have been reported offshore, while most sightings of adults and subadults are in water less than 165 feet deep off the coast. During the period 1988 through 2008, six strandings were reported in San Diego County, three were determined to be illness-related and the remaining three were undetermined (NMFS 2009). It would be rare, but possible to encounter olive ridley sea turtles in the ROI, and only in the warmest months.

Olive ridleys prey on benthic fish, mollusks, crustaceans, tunicates, and algae. Pelagic prey includes jellyfish, salps, and pelagic red crabs (NMFS 1998e).

#### 3.10.1.2.3 Leatherback Turtle

The leatherback turtle was listed as endangered throughout its range in June 1970 (Federal Register Vol. 35 No. 106 pp 8491-8498). The leatherback is associated with continental shelf habitats and pelagic environments. It is uncommon in the insular Pacific, but individuals are sometimes encountered in deep water, near prominent archipelagoes (NMFS 1998d). To a large extent, the oceanic distribution of leatherbacks may reflect the distribution and abundance of macroplanktonic prey. (NMFS 1998d, NMFS

2007b). In response to a September 2007 petition to designated leatherback critical habitat off California and Oregon, NMFS determined the information presented in the petition warranted consideration of designation and will soon publish its proposed determination in the Federal Register.

The world leatherback turtle population is estimated at 35,860 females (Spotila 2004). Leatherbacks are seriously declining at all major Pacific basin rookeries. Nesting along the Pacific coast of Mexico declined at an annual rate of 22 percent over the last 12 years, and the Malaysian population represents one percent of the levels recorded in the 1950s (Dutton 2006).

The leatherback is the most widely distributed sea turtle, ranging far from its tropical and subtropical breeding grounds. It has the most extensive range of any adult, being found from 71ºN to 47ºS (Eckert, 1995). Leatherbacks are highly pelagic and approach coastal waters only during the reproductive season (EuroTurtle 2001). Postnesting adult leatherbacks appear to migrate along bathymetric contours from 650 to 11,500 ft (200 to 3,500 m) (Morreale et al. 1994), and most of the eastern Pacific nesting stocks migrate south (NMFS 2002).

The leatherback turtle is rare in the waters of southern California and sightings are infrequent within San Diego County or adjacent nearshore waters. During the period 1988 through 2008, nine strandings were reported in San Diego County, two were determined to be entrainment related, one fishery related and the remaining six were undetermined (NMFS 2009). It would be unlikely to encounter leatherback turtles, except in the offshore waters due to its preference for the pelagic habitat; and even then and encounter would likely only occur in July to September.

### 3.10.1.2.4 Pacific Green Sea Turtle

The green sea turtle is globally listed as threatened under the ESA, except for Florida's and the Pacific coast of Mexico's breeding population, which is listed as endangered. The worldwide population is estimated at 88,520 nesting females (Spotila 2004). Population estimates for the eastern Pacific region that includes the ROI are approximated because juvenile and male sea turtles do not come ashore, and are difficult to count. Population data are usually based on the numbers of adult females coming ashore to nest, but these numbers can be ambiguous: some females nest every two to three years, some may nest more than once on the same beach in a season, and some visit more than one nesting beach in a season. Researchers rely on the changing numbers of nesting females from year-to-year to determine population trends. Because broad year-to-year fluctuations in numbers of nesting females make short-term data misleading, surveys of a decade or less may be insufficient to determine a population trend (NMFS 2008).

Currently between 200 and 1,000 green sea turtles nest on beaches in the continental United States; no green sea turtles have been documented to nest on the west coast. Green sea turtles are capable of transoceanic migrations, but use coastal and open ocean waters within several hundred to one thousand kilometers of nesting grounds. In the eastern North Pacific, green turtles have been sighted from Baja California to southern Alaska, but most commonly occur from San Diego south (NMFS 2008).

Stinson (1984) reviewed sea turtle sighting records from northern Baja California to Alaska, and determined that the east Pacific green turtle was the most commonly observed hard-shelled sea turtle on the Pacific coast. Most of the sightings (62.0 percent) were reported from northern Baja California and southern California. The northernmost reported resident population occurs in San Diego Bay (Stinson 1984; Dutton and McDonald 1990a, 1990b, 1992; Dutton et al. 1987). Although green turtles are sighted throughout the year in the waters of southern California, the highest frequency of sightings occurred during the warm summer months of July through October (Stinson 1984). In waters south of Point Conception, Stinson (1984) found this seasonal sighting pattern to be independent of inter-year temperature fluctuations. North of Point Conception, more sightings occurred during warmer years. Green turtles appear to prefer waters that usually remain around 20°C in the coldest month. During warm spells, such as El Niño, green turtles may be found considerably north of their normal distribution. Stinson (1984) found green turtles to appear most frequently in U.S. coastal waters with temperatures exceeding 18°C. An east Pacific green turtle equipped with a satellite transmitter was tracked along the California coast and showed a distinct preference for waters with temperatures above 20°C (Eckert, unpublished data). The Green sea turtle is the most common sea turtle observed in the waters of Southern California but sightings remain rare within San Diego County or adjacent nearshore waters. During the period 1988 through 2008, 55 strandings were reported in San Diego County of which nine were determined to be related to boat collisions (NMFS 2009).

The two closest breeding populations to the ROI are located in Mexico: Isla Revillagigedos and Michoacan. Estimates from index calculations project there are 900 and 1400 individuals in each respective population. Green sea turtles are well documented at year-around feeding areas, such as those located on the west coast of Baja California, in the Gulf of California (Sea of Cortez), and along the coast of Oaxaca (NMFS 1998c). Green turtles primarily use three types of habitat: oceanic beaches (for nesting), convergence zones in the open-ocean, and benthic feeding grounds in coastal areas. Adult females migrate from foraging areas to mainland or island nesting beaches and may travel hundreds or thousands of kilometers each way. After emerging from the nest, hatchlings swim to offshore areas, where they live for several years, feeding close to the surface on a variety of pelagic plants and animals. Once the juveniles reach a certain age/size range, they leave the pelagic habitat and travel to nearshore foraging grounds. Once they move to these nearshore benthic habitats, adult green turtles are almost exclusively herbivores, feeding on sea grasses and algae (accessed online at: http://www.nmfs.noaa.gov/pr/species/ turtles/green.htm#habitat). The temperate waters off the Pacific coast of Mexico and California provide a wide variety of potential food sources, including several sea grasses and algae. Bahía de Los Angeles in the Gulf of California is an important foraging area for green turtles (Seminoff et al. 2003).

Green turtles dive shallower than 100 feet (Hochscheid et al. 1999, Hays et al. 2000); however, they have been observed at depths of 220 to 350 feet in the eastern Pacific Ocean (Berkson 1967). The maximum dive time recorded for a juvenile green turtle around the Hawaiian Islands is 66 minutes, with routine dives ranging from 9 to 23 minutes (Brill et al. 1995).

### San Diego Bay

The only turtle found in ROI waters is the east Pacific green sea turtle (Macdonald et al. 1990), which is listed under ESA as endangered. This species is the same as the Atlantic green sea turtle; however, the Pacific stock has distinctive color morphology (Eckert 2002). Many scientists previously believed the green sea turtle was not a historical resident of San Diego Bay; now they have concluded that it may have naturally sought out San Diego Bay at least during the summer months (Macdonald et al. 1990; Eckert 2002 and Dutton 1998). In 1857, commercial activities brought sea turtles from Mexico and temporarily kept them in pens within San Diego Bay before being shipped north for sale in San Francisco (Stinson 1984). This practice continued for many decades; a photograph dated 1910 can be seen at the San Diego Maritime Museum showing stacks of sea turtles awaiting shipment piled up on a San Diego Bay wharf. Some of these turtles escaped and may have become inhabitants of San Diego Bay.

In the 1920s, San Diego Gas and Electric built a power plant on Broadway in downtown San Diego; and then added its Silvergate plant on the eastern shore of San Diego Bay in 1941 (Smith and Graham 1976). In 1951, as a product of the power plants' water cooling systems, discharged effluents were recorded up to 8°C warmer than the intake temperature (Terzich 1965). In 1960, San Diego Gas and Electric began operating a new, larger power plant in South San Diego Bay, expanding into additional units over the next several years. The addition of these plants, and the accompanying warm water discharges, unintentionally altered the San Diego Bay abiotic conditions to provide attractive year-around habitat for the warm water-seeking sea turtle.

The first report of sea turtles in this power plant's warm water discharge channel was made in 1968 as part of a study of the ecological effects of the discharge (Ford 1970). Water temperatures at the surface ranged from 35°C at the outfall to 28°C at the end of the 6,000 foot channel, compared to 28°C in central San Diego Bay (Ford et al. 1970).

Green turtles foraging in San Diego Bay and along the Pacific coast of Baja California originate primarily from rookeries of the Islas Revillagigedos (Dutton 2003). Both adults and juveniles have been sighted, with individuals seen throughout the summer and winter at the San Diego Gas and Electric channel, South San Diego Bay, and around Coronado Bridge, near a thick stand of eelgrass (Ford and Chambers 1973, Stinson 1984, Macdonald et al. 1990, Dutton and McDonald1992). Even in temperatures as cold as 14°C, turtles are actively swimming in San Diego Bay. They do not breed or nest in San Diego Bay, as they need undisturbed beaches for nesting (Macdonald et al. 1990)—those found along the coast of Mexico. Tagged individuals are known to return to San Diego Bay in subsequent years for unknown reasons (Stinson 1984). Residency time in San Diego Bay is unknown; turtles within the local population were satellite tagged and tracked back to Mexico breeding beaches; significant immigration and emigration is thought to occur. Based on the number of juveniles recently observed, there is some recruitment into the population (Dutton and McDonald1992), and according to Dutton (2003) the recruitment source is Isla Revillagigedos. Warm water El Niño events could stimulate an increase in migrations.

The resident population of east Pacific green sea turtles in San Diego Bay is approximately 30 to 60 individuals, increasing to nearly 100 during peak migratory time periods (DoN 2008); however, there is limited information about their movements or behavior. It is unknown how often they leave San Diego Bay or where they reside when they are outside the South San Diego Bay Power Plant channel. Female east Pacific green sea turtles are believed to migrate from San Diego Bay to nesting grounds in Mexico prior to nesting season; the remaining male adults and subadults continue to be present within San Diego Bay. Eelgrass beds, as well as associated algae and invertebrates known to be food for turtles, are extensive in the South and South Central San Diego Bay. Recent information on turtle foraging (Seminoff 2006) has broadened the general understanding of targeted food items as well as expanded the idea that adult green sea turtles are more omnivorous than previously thought. Resident turtles within the ROI may be utilizing invertebrates within deeper areas of San Diego Bay, in conjunction with eelgrass and algae as food sources.

Potential habitat for Pacific green sea turtles within San Diego Bay, and adjacent sandy beaches near Silver Strand and Imperial Beach—including the ROI—may be utilized during foraging, but are not considered suitable for nesting. Foraging by Pacific green sea turtles is concentrated to eelgrass beds and to lesser extent invertebrate communities in South and South Central bay, considering the concentration of the majority of habitat within those areas (see Figure 3.7-2). Potential foraging areas outside the bay associated with kelp beds or eelgrass are primarily located adjacent to the mouth of San Diego Bay (Zuniga Jetty) and north towards Point Loma. Silver Strand and Imperial Beach to the south contain ephemeral low density macroalgae communities, but are exposed to the dominant western wave action and long shore sand transport. Because very little is known about foraging patterns of resident Pacific green sea turtles within San Diego Bay, and the majority of sightings have been concentrated in the South Bay power plant channel, inferences about movement patterns remain conjecture.

An ongoing Navy/Port/National Oceanic and Atmospheric Administration (NOAA)-NMFS tracking effort is underway to determine the level of movement of the east Pacific green sea turtle within San Diego Bay. Approximately 18 turtles in San Diego Bay are tagged with devices that can be read by listening stations (hydrophones) in the water. The hydrophones are located in a two-stranded arc stretching from the southeast corner of SSTC-N to the north side of Delta South, surrounding the Enhancement Island. This double line functions as a gate. If a tagged turtle enters this area, a signature will be left on the hydrophones it passes—documenting where it entered the area and where it exited. This presence/absence determination will help guide planning for Navy actions and construction, as well as guide remediation studies. NOAA's objectives in the effort are to determine spatial and temporal population distributions, preferred habitat, and ingress and egress into San Diego Bay.

### Ecological Role

Sea turtles are primarily herbivore grazers of marine algae and grasses. Previous studies concluded that during the day, San Diego Bay turtles reside in the deeper portion of the South San Diego Bay Power Plant warm water discharge channel, and at night feed on eelgrass beds in South San Diego Bay, such as Coronado Cays (Stinson 1984). Stomach content analysis revealed that the turtles eat red alga, eelgrass, and sea lettuce (*Ulva* sp.) within South San Diego Bay (Dutton and McDonald1992). Recent studies investigating daily movements and activity ranges of green turtles at Bahia de Los Angeles, a neritic foraging area, documented dispersal of turtles while resident at coastal foraging areas (Seminoff and Jones 2006). Data suggested that green turtles traversed large distances over limited temporal durations visiting multiple habitats. Contrary to previously perceived movement patterns, Seminoff and Jones (2006) found that in general, green turtles at Bahia de los Angeles moved throughout the diel cycle with greater distances covered during diurnal versus nocturnal periods.

While young turtles are carnivorous from hatchling until juvenile size and gradually becoming herbivorous, they have also been described as opportunistic feeders, eating jellyfish, ctenophores, bivalves, or gastropods if readily available (Eckert 2002). The warmer environment of the discharge channel appears to have stimulated growth rates in the turtles that are twice that of non-San Diego Bay turtles, possibly by increasing their digestive efficiency (Dutton and McDonald 1992). San Diego Bay is unique in the eastern Pacific as having the only thermal gradient where turtles can select their optimum space (Eckert 2002). The main, warm water effluent of the power plant has allowed the green sea turtle to remain in San Diego Bay during the normally cooler winter months. When temperatures rise in the channel, turtles disperse throughout San Diego Bay. When temperatures exceeded 29 to 32°C, which is approaching their lethal limit (Dutton 1992, 1993), no turtles were observed in the channel. Their crucial habitat zones in other parts of San Diego Bay in the warmer months are not known. Recent sightings in Seal Beach during winter in an embayed settling pond raised the question of the green turtles foraging and resident extent with respect to southern California (Schallmann 2009). In review, very little information is available on green sea turtles residing in San Diego Bay and to what extent they forage or transit within San Diego Bay.

The turtle has no natural predators in San Diego Bay. Mortalities tend to be caused by various natural and human induced causes including collisions with boats or ships (NMFS 2009). Unlike the Hawaiian stock, where tumors on green turtles are now epidemic in polluted waters, the San Diego Bay population has shown only a few individuals to have fibropapilloma tumors, which usually begin in the eye area (McDonald and Dutton 1990; Dutton 1998).

## 3.10.1.3 Regulatory Framework

Sea turtles present at SSTC are listed under ESA. Under ESA, Federal agencies are required to consult with NMFS on proposed Federal actions that "may affect" listed species or critical habitat. If a proposed Federal action may affect a listed species or designated critical habitat, formal consultation is required except when the Services concur that the proposed action "is not likely to adversely affect" listed species or designated critical habitat. [50 CFR 402.02, 50 CFR 402.13]. The Navy, based on the assessment provided below, believes that the proposed action on SSTC may affect but is not likely to adversely affect the federally listed turtle species found within SSTC. In accordance with ESA requirements, the Navy has completed informal consultation under Section 7 of the ESA with NMFS. NMFS has concurred that that with implementation of mitigation measures, the Proposed Action may affect, not likely to adversely affect, ESA-listed species and has signed a letter of concurrence on 19 November, 2010.

#### 3.10.1.4 Current Mitigation Measures

Current procedures for monitoring sea turtles before and after underwater detonations are designed to prevent harm to these animals. There are numerous mitigation measures for very shallow water (VSW) underwater detonations on SSTC oceanside (0-24 feet):

1. Easily visible anchored floats will be positioned on a 1,200 foot or 400 yard radius of a roughly semi-circular zone (the shoreward half being bounded by shoreline and immediate off-shore water) around the detonation location for small explosive exercises at the SSTC. These mark the outer limits of the mitigation zone.
2. For each VSW underwater detonation event, a safety-boat with a minimum of one observer is launched 30 or more minutes prior to detonation and moves through the area around the detonation site. The task of the safety observer is to exclude humans from coming into the area and to augment a shore observer's visual search of the mitigation zone for sea turtles. The safety-boat observer is in constant radio communication with the exercise coordinator and shore observer discussed below.
3. A shore-based observer will also be deployed for VSW detonations in addition to boat based observers. The shore observer will indicate that the area is clear of marine mammals after 10 or more minutes of continuous observation with no sea turtles having been seen in the mitigation zone (1,200 feet or 400 yards) or moving toward it.
4. At least 10 minutes prior to the planned initiation of the detonation event-sequence, the shore observer, on an elevated on-shore position, begins a continuous visual search with binoculars of the mitigation zone. At this time, the safety-boat observer informs the shore observer if any sea turtle has been seen in the zone and, together, both search the surface within and beyond the mitigation zone for sea turtles.
5. The observers (boat and shore based) will indicate that the area is not clear any time a sea turtle is sited in the mitigation zone or moving toward it and, subsequently, indicate that the area is clear of sea turtles when the animal is out and moving away and no other sea turtles have been sited.
6. Initiation of the detonation sequence will only began on final receipt of an indication from the shore observer that the area is clear of sea turtles and will be postponed on receipt of an indication from that any observer that the area is not clear of sea turtles.
7. Following the detonation, visual monitoring of the mitigation zone continues for 30 minutes for the appearance of any sea turtle in the zone. Any sea turtles appearing in the area will be observed for signs of possible injury.
8. Any sea turtle observed after an underwater detonation training event either injured or exhibiting signs of distress will be reported to Navy environmental representatives from the regional Navy shore commander (Commander, Navy Region Southwest) and U.S. Pacific Fleet, Environmental Office, San Diego Detachment. The Navy will report these events to the Stranding Coordinator of NMFS' Southwest Regional Office using Marine Mammal Stranding communication trees and contact procedures established for the Southern California Range Complex. These voice or email reports will contain the date and time of the sighting, location (or if precise latitude and longitude is not currently available, then the approximate location in reference to an established SSTC beach feature), species description (if known), and indication of the animal's status.

There are similar mitigation measures for shallow water underwater detonations on SSTC oceanside (24-72 feet):

1. A mitigation zone of 1,500 feet or 500 yards will be established around each underwater detonation point. This mitigation zone is based on the maximum range to onset-TTS (either 23 psi or 182 dB).
2. A minimum of two boats, including but not limited to small zodiacs and 11-meter Rigid Hulled Inflatable Boats (RHIB) will be deployed. One boat will act as an observer platform, while the other boat is typically the diver support boat.
3. Two observers with binoculars on one small craft/boat will survey the detonation area and the mitigation zone for sea turtles from at least 30 minutes prior to commencement of the scheduled explosive event and until at least 30 minutes after detonation.
4. In addition to the dedicated observers, all divers and boat operators engaged in detonation events can potentially monitor the area immediately surrounding the point of detonation for sea turtles.
5. If a sea turtle is sighted within the 1,500 foot or 500 yard mitigation zone or moving towards it, underwater detonation events will be suspended until the sea turtle has voluntarily left the area and the area is clear of sea turtles for at least 30 minutes.
6. Immediately following the detonation, visual monitoring for sea turtles within the mitigation zone will continue for 30 minutes. Any sea turtle observed after an underwater detonation training event either injured or exhibiting signs of distress will be reported to Navy environmental representatives from the regional Navy shore commander (Commander, Navy Region Southwest) and U.S. Pacific Fleet, Environmental Office, San Diego Detachment. The Navy will report these events to the Stranding Coordinator of NMFS' Southwest Regional Office using Marine Mammal Stranding communication trees and contact procedures established for the Southern California Range Complex. These voice or email reports will contain the date and time of the sighting, location (or if precise latitude and longitude is not currently available, then the approximate location in reference to an established SSTC beach feature), species description (if known), and indication of the animal's status.

The conditions of the oceanside training areas at SSTC (Boat Lanes 1-14) and the existing mitigations in effect are expected to provide for reliable and effective mitigation of harm to infrequent and transitory sea turtles from underwater detonations. The physical topography of the VSW zone, low numbers of protected species in VSW, and training routines at SSTC allow for exceptionally reliable and effective mitigation procedures. Unlike typical circular pressure wave propagation, pressure-wave propagation in VSW (and thus mitigation zones), is restricted to a relatively small area and volume due to the nearby shoreline and shallow depth. The shoreline limits the zone to a rough semi-circle extending seaward about the point of detonation - i.e., the site has a field-of-search with a visual angle from the shore of less than 180 degrees. The beach slopes up from the waterline with an elevated on-shore position that provides a stable – i.e., unmoving - elevated height-of-eye for complete binocular-aided observation of the detonation area and sea-surface beyond 1,300 ft seaward of the detonation locations. Visual observation from the shore is combined with the observations of a safety boat operator moving through and beyond the mitigation area.

The following mitigation measures for the Elevated Causeway System (ELCAS) and pile driving activities incorporated the existing range procedures at SSTC and were consistent with existing training objectives and activities as well as established human safety procedures. In case of unanticipated conflict, human safety considerations take precedence and such conflicts are always used to make incremental improvements in the procedures used in subsequent activities. The Navy implements four mitigation measures for ELCAS activities performed at SSTC:

1. Buffer; Navy will monitor a 150 foot buffer zone surrounding temporary pile driving and removal activities for the presence of sea turtles before, during, and after pile removal activities. If sea turtles are found in the area, pile removal activities will be halted until the sea turtles have voluntarily left the ZOI. The buffer zone is based off of ZOIs calculated for marine mammals and is expected to be larger than that required for sea turtles.
2. Monitoring: Monitoring for sea turtles will take place concurrent with pile removal activities and 30 minutes prior to pile removal commencement. A trained observer will be placed on shore, on the ELCAS, or in a boat at the best vantage point(s) practicable to monitor for sea turtles and will implement shut–down/delay procedures when applicable by calling for shut–down to the hammer operator.
3. Soft Start: Providing additional protection for sea turtles, ELCAS pile driving includes a soft start as part of normal construction procedures. The pile driver increases impact strength as resistance goes up. At first, the pile driver piston drops a few inches. As resistance goes up, the pile driver piston will drop from a higher distance thus providing more impact due to gravity. This will allow sea turtles in the project area to vacate or begin vacating the area minimizing potential harassment. The ELCAS soft start is not the traditional soft-start used in bigger civilian construction projects, and doesn't include a waiting period (an initial set of several strikes from the impact hammer at 40-60 percent energy levels, followed by a one minute waiting period, then two subsequent 3 strike sets), but does provide additional time for sea turtles to vacate the area. Including waiting periods as part of training would be inconsistent with Navy training objectives that requires the ELCAS to be constructed as quickly as possible in real world conditions to ensure rapid supply of equipment and materials to shore in a hostile territory during wartime, or during humanitarian assistance operations.
4. Any sea turtle under observed after an underwater detonation or ELCAS training event either injured or exhibiting signs of distress will be reported to Navy environmental representatives from the regional Navy shore commander (Commander, Navy Region Southwest) and U.S. Pacific Fleet, Environmental Office, San Diego Detachment. The Navy will report these events to the Stranding Coordinator of NMFS' Southwest Regional Office using Marine Mammal Stranding communication trees and contact procedures established for the Southern California Range Complex. These voice or email reports will contain the date and time of the sighting, location (or if precise latitude and longitude is not currently available, then the approximate location in reference to an established SSTC beach feature), species description (if known), and indication of the animal's status.

The above mitigation measures were developed primarily for marine mammal species based on their detectability and potential for hearing impairment or injury from underwater detonations and are applied at SSTC for sea turtle species as well. These mitigation zones are expected to be greater than the zones in which sea turtles are believed to be physically affected.

### 3.10.2 Environmental Consequences

This section presents the analysis of potential impacts to sea turtles as a result of implementation of the project alternatives, including the No Action Alternative. The analysis of effects on turtles concerns direct physical injury—the potential for death, injury, and disturbance. Potential effects to sea turtles from training events are consistent for all sea turtle species. However, of the four species of sea turtle that could potentially be located within the ROI, only the green sea turtle is documented to be present in the ROI. As training activities are of short duration and dispersed throughout the ROI, the probability of encounter with sea turtle species that are considered rare in the ROI would be extremely low. Therefore, the green sea turtle is the only species addressed in this analysis.

Activities analyzed in this section for all alternatives are Activities 1-30, 32-35, 37-42, 44-46, 49-53, 57, and 77-78, N1-N9, Tables 2-1 and 2-2. Marine vessels provide support to a host of activities and are subsequently analyzed for effect; however, portions of training activities in which interactions between personnel/craft and turtles are anticipated to be rare, such as swimming, Self-Contained Underwater breathing Apparatus (SCUBA) diving, or activities that utilize only non-motorized Combat Raiding Rubber Craft (CRRCs) (Activities 54, 55, 56, 60, 64, 67, 69, 70, 71, and 73, Table 2-1), are excluded from individual activity analysis as potential impacts from interactions would be minimal to non-existent. Training activities that occur exclusively on the land portion of SSTC (Activities 17, 19, 31, 36, 43, 47, 48, 58, 59, 61, 62, 63, 66, 65, 68, 72, 73, 74, 75, 76, and N10, Tables 2-1 and 2-2) that are not anticipated to interact with the marine environment are excluded from this analysis as they are not expected to impact turtles that may be present adjacent to the SSTC beach or bayside training areas.

### 3.10.2.1 Approach to Analysis

In order to assess the overall impact of training events on turtle resources in the ROI, the training activities were divided into constituent actions that have the potential to impact the environment. Training activities were grouped into categories to assess potential effects for similar activities, including Aircraft Activities, Marine Vessel Activities, Underwater Detonations, and Amphibious and Beach Activities. These activities occur in a defined manner and space; therefore the effect of these activities on the environment can be assessed. For this analysis, activities are described in the following sections to define the potential effects the activities may have on turtles within the ROI. Information about the location and footprint of these activities was obtained through interviews with Navy training professionals.

Activities may negatively impact sea turtles through generation of noise and/or pressure waves and by causing habitat degradation or loss. Effects on sea turtles vary based on the type, magnitude, duration, and distance from the disturbance, as well as the natural history and unique behavior of each species of turtle.

The following human actions have been documented to affect sea turtles, and may occur in the ROI (NMFS 1998): ship or boat strikes, artificial lighting, beach cleaning, beach erosion, beach replenishment, coastal construction, and increased human presence. Of these, boat propellers and collisions are documented to have killed or harmed turtles in both San Diego and Mission Bay (McDonald and Dutton 1992). Primarily, many of these human actions are adverse only at nesting beaches, which are not present in the ROI; thus, most of the actions in the ROI do not directly kill or harm turtles, but instead degrade habitat or alter behavior. Foraging behavior within the ROI consists of bottom feeding of eelgrass, algae, and attached invertebrates. There is a low probability of turtle's ingesting byproducts from human actions, as most such occurrences are related to sea turtles ingesting plastic bags that are mistaken for jellyfish: jellyfish are most abundant in pelagic waters and would not be expected to be present or targeted by turtles within the ROI.

A general understanding of sea turtle hearing and possible effects to sea turtles is presented below in Sections 3.10.2.1.1 through 3.10.2.1.5 as a basis for which to apply the effects of Navy training activities; however, the data obtained on effects of sound and shock waves on turtles is limited, and most information regarding effects is based on marine mammal studies. A determination of possible harmful effects to sea turtles are significantly limited to the range of data available for any particular type of sound source. Additionally, available data focused on turtle disturbances related to effects on behavioral changes or foraging patterns from marine vessels, aircraft, or underwater detonations are limited or absent. Given the sources of shock waves, sound, and disturbance associated with the activities contained in Chapter 2, effects to turtles are grouped by activity.

### 3.10.2.1.1 Sea Turtle Hearing

Sea turtles do not have an auditory meatus or pinna that channels sound to the middle ear; nor do they have a specialized tympanum (eardrum), like mammals do. Instead, they have a cutaneous layer and underlying subcutaneous fatty layer that function as a tympanic membrane. The subcutaneous fatty layer receives and transmits sound to the extracolumella—a cartilaginous disk—located at the entrance to the columella, a long, thin, bone that extends from the middle ear cavity to the entrance of the inner ear or otic cavity (Ridgway et al. 1969). Sound arriving at the inner ear via the columella is transduced by the bones of the middle ear. Sound also arrives by bone conduction through the skull. Sea turtle auditory sensitivity is not well studied; though, a few preliminary investigations suggest that it is limited to low frequency bandwidths, such as the sound of waves breaking on a beach.

The role of underwater low frequency hearing in sea turtles is unclear. Sea turtles may use acoustic signals from their environment as guideposts during migration, and as a cue to identify their natal beaches (Lenhardt et al. 1983). The range of maximum sensitivity for sea turtles is 100 to 800 hertz (Hz), with an upper limit of about 2,000 Hz (Lenhardt 1994). The effective range of hearing for green and loggerhead sea turtles is 100 to 500 Hz (Ridgway et al. 1969, Moein et al. 1994, Ketten and Bartol 2006). Below 80 Hz sea turtle hearing is less sensitive, but still potentially usable to the animal (Lenhardt 1994). Ridgway et al. (1969) used aerial and mechanical stimulation to measure the cochlea in three specimens of green turtle; he concluded that they have a useful hearing span of perhaps 60 to 1,000 Hz, but hear best from about 200 up to 700 Hz—with their sensitivity falling off considerably below 200 Hz. The maximum sensitivity for one animal was at 300 Hz, and for another was at 400 Hz. At the 400 Hz frequency, the turtle's hearing threshold was about 64 decibels (dB) in air (approximately 126 dB in water). At 70 Hz, it was about 70 dB in air (approximately 132 dB in water). Bartol et al. (1999) reported juvenile loggerhead sea turtles could hear sounds between 250 and 1,000 Hz. Lenhardt et al. (1983) applied audio frequency vibrations at 250 and 500 Hz to the heads of loggerheads and ridleys submerged in salt water to observe their behavior, measure the attenuation of the vibrations, and assess any neural-evoked response. These stimuli were chosen as representative of the lowest sensitivity area of marine turtle hearing (Wever 1978). At the maximum upper limit of the vibratory delivery system, the turtles exhibited abrupt movements, slight retraction of the head, and extension of the limbs in the process of swimming. Lenhardt et al. (1983) concluded that bone-conducted hearing appears to be a reception mechanism for at least some of the sea turtle species, with the skull and shell acting as receiving surfaces. Finally, sensitivity within the optimal hearing range is apparently low—as threshold detection levels in water are high at 160 to 200 dB referenced to 1 micropascal meter (dB re 1 μPa-m) (Lenhardt 1994).

### 3.10.2.1.2 Effects of Shock Waves

Several factors determine a turtle's susceptibility to injury and death from shock wave effects. Most blast injuries in turtles and other marine animals involve damage to air- or gas containing organs or damage to the membranes associated with auditory acquisition. Specific studies investigating potential effects to turtles from shock waves are limited and, in most cases, estimated based on marine mammal criteria and relative differences in hearing thresholds between the two groups.

Viada et al. (2008) presented a summary of the limited field observations and experiments of explosive impacts on sea turtles. In several instances, turtle injuries and mortalities—and in some cases, strandings—have been noted following underwater detonations. In one case where turtles were recovered after an openwater detonation, both charge weight (1,200 pound) and the approximate distances (500 to 2,000 feet) of the turtles from the detonation were known (O'Keefe and Young, 1984). Only one field experiment has been conducted in which sea turtles were exposed at known distances from a structure removal detonation; however, that study did not include concurrent pressure measurements to estimate the magnitude and duration of the shock wave received by caged turtles (Klima et al. 1988). In this study, four Kemp's ridley and four loggerhead turtles were placed in cages at four distances (750 feet, 1,200 feet, 1,800 feet and 3,000 feet) from an offshore platform scheduled for removal using explosive charges. Cages were suspended at a depth of 15 feet over a seafloor of 30 feet depth prior to the *simultaneous* detonation of four, 50.75-pound charges of nitromethane, placed inside the platform's support pilings at a depth of 16 feet below the seafloor surface. Sea turtles exposed at 750 and 1,200 feet as well as one loggerhead exposed at 3,000 feet, were rendered unconscious. The Kemp's ridley turtle exposed at 750 feet also sustained slight physical injury, showing an eversion of cloacal lining through its vent. Remaining Kemp's ridley turtles at more distant ranges were apparently unharmed. Unfortunately, this study did not include concurrent pressure measurements to estimate the magnitude and duration of the shock wave received by the caged turtles.

Two immature green turtles were killed when 20 pounds of plastic explosives (C-4) were detonated in open water in the eastern Gulf of Mexico—at distances of 100 to 150 feet from the charge—by a U.S. Navy Ordnance Disposal Team. Overall water depth, charge depth, and turtles' depth were not reported. Turtles' body masses were not provided; however, it is assumed they were small, considering the turtles were reported as immature. In an open water environment, 20 pounds of C-4 explosive would be expected to generate nominal peak pressures of 347 and 244 pounds per square inch (psi) at ranges of 100 and 150 feet, respectively. Current SSTC mitigation measures require a 1,200 foot radius area surrounding detonation locations that are in 0 to 24 feet of water and a 1,500-foot radius area surrounding detonation locations that are in 24 to 72 feet of water; at these distances from a 20-pound explosive source, the estimated received levels at these ranges would be less than approximately 15 psi.

While there have been several reports of turtle impacts and injury following structure removal detonations, there has been no mechanistic model developed to estimate impacts on sea turtles. Rather, it is assumed that models developed for other vertebrates are reasonable approximations. O'Keeffe and Young (1984) developed an equation for a turtle safety range—the distance beyond which turtles would not likely be killed or seriously injured—based on field observations of three turtles following an open-water detonation. The equation is based on cube-root scaling of the charge weight and the distance at which one turtle was not affected. Young (1991) provided a more conservative version of the same equation but states that it is based on the criteria for platform removal established by the NMFS (i.e. it was not independently derived from observations or experimental data). The Navy (2001) also modeled effect ranges using the turtle death/injury observations from O'Keeffe and Young (1984), and a lung injury model developed by Goertner (1982) for small mammals. Results suggest that lung injury predictions for sea turtles are not inconsistent with predictions for small mammals.

To assess the ZOI and potential effects of underwater explosions on green sea turtles at SSTC, separate criteria are used for mortality, injurious physiological effects, and TTS. As a conservative metric, SSTC criteria are based on the numeric criteria for underwater explosive events derived for marine mammals and approved by NMFS in recent NMFS rule making (NMFS 2009a, 2009b) for underwater detonations. The criteria and thresholds for injury and harassment are summarized in Table 3.10-1.

Mortality from the onset of severe lung injury is based on a Goertner modified positive impulse index of 30.5 psi-ms (Goertner 1982). Slight Injury is designated as the point of slight lung injury based on a Goertner modified positive impulse index of 13 psi-millisecond (psi-ms) and tympanic membrane rupture which corresponds to 50 percent rate of rupture at 205 dB re 1 squared micropascal-second ($\mu Pa^2 \bullet s$) maximum sound exposure level (SEL) level in any 1/3-octave band at frequencies >100 Hz. Physiological disruption is designated as sound exposure to 182 dB re1$\mu Pa^2$-sec greatest SEL in any 1/3-octave band over all exposures, and also 23 pounds per square inch (psi) peak pressure for any single exposure.

**Table 3.10-1: Summary of Criteria and Acoustic Thresholds for Underwater Detonation Impacts to Sea Turtles**

| Underwater Explosive Criteria | | |
|---|---|---|
| **Criterion** | **Criterion Definition** | **Threshold** |
| Mortality | Onset of severe lung injury (1% probability of mortality) | 31 psi-ms (positive impulse) |
| Level A Harassment (Injury) | Onset of lung injury | 13.0 psi-ms (positive impulse) |
| | 50% of population would experience ear drum rupture | 205 dB re 1$\mu$Pa$^2$-sec (full spectrum energy) |
| Level B Behavioral Harassment | TTS (dual criteria) | 23 psi (peak pressure; explosives <2,000 lbs), or |
| | | 182 dB re1$\mu$Pa$^2$-sec (peak 1/3 octave band) |
| | (sequential detonations only) | 177 dB re 1$\mu$Pa$^2$-sec |

Impulse levels generated from training activities that could potentially adversely affect sea turtles are either confined to waters less than 72 ft depth within ocean training lanes (detonations) or occur infrequently (pile driving, 4 times/yr) and, in conjunction with established mitigation measures are unlikely to injure sea turtles. Impulse levels from underwater detonations and pile driving activities would likely reach levels sufficient to modify turtle behavior within the immediate area and would qualify as Level B harassment. Given the nonlinear degradation of impulse waves through seawater and the variability of bottom substrate and depth at different detonation sites, it is difficult to estimate the distance of no effect for all the possible ranges of detonation.

### 3.10.2.1.3 Acoustic Effects of Underwater Sound

Little is documented or understood about the hearing ability of any sea turtle species or their dependency on sound, passive or active, for survival cues. A complication is that sea turtles occupy a wide range of habitats, and each life stage of sea turtles has exceptional differences in gross morphometry of auditory structures and in the physical parameters of their habitat (Ketten et al. 2003). Recent hearing studies investigating auditory brainstem responses, in conjunction with analyzing variation in auditory anatomy, reported smaller juvenile green sea turtles responded to sounds between 100 to 800 Hz (most sensitive hearing range from 600 to 700 Hz); the larger sub-adult green sea turtles had a more constricted range of hearing, from 100 to 500 Hz—similar to the larger loggerhead sea turtles.

There are two types of sound sources that are of major concern to turtles with respect to activities conducted under the Proposed Action: (1) strong underwater shock pulses that can cause physical damage to auditory structures; and, (2) underwater sounds that could cause disturbance or injury. Both types of sound can cause injury or result in distribution and/or behavioral changes. Sound attributed to aircraft over-flight does not propagate sufficient underwater shock waves (associated with explosions) to elicit lethal or sublethal effects to turtles. Predicted sound levels resulting from HC-130 aircraft flying at 1,000 feet and 250 feet were 110 and 121 dB re 1 μPa, respectively, directly under the flight path at a depth of one foot (maximum 1/3-octave level frequencies 20 Hz to 5 kilohertz [kHz]) (US Air Force 1999). Additional noise modeling indicates that the predicted sound level at a depth of one foot resulting from the overflight of an HH-60 helicopter at 100 feet would be approximately 100 to 118 dB re 1 µPa (frequencies of 20 Hz and 5 kHz). At these lower frequencies, it is anticipated that the threshold of sea turtle hearing is in excess of 126 dB re 1 µPa. As this hearing threshold is above the anticipated sound produced by aircraft overflights, this EIS will not address the acoustic effects of aircraft on sea turtles.

A hovercraft, or Landing Craft Air Cushion (LCAC) unit, is a large craft that uses fans to hover above the water. Its footprint includes its physical structure plus 50 feet surrounding it, because of the strong wind produced by the fans. An LCAC approaches the beach and comes ashore up near the crest of the beach. Hovercraft were recorded in the frequency ranges of 80 to 630 Hz with source level of up to approximately 110 dB re 1 µPa and 50-2000 Hz with a source level up to 121 re 1 µPa (Richardson et al. 1995). Recordings of a Griffon 2000TD hovercraft passing a hydrophone at full power in Prudhoe Bay, Alaska indicated broadband (10 to 10,000 Hz) levels reaching 133 dB re 1 µPa (Blackwell and Greene 2005), with most spectral energy centered around 87 Hz. Therefore, turtles can likely sense hovercraft at the low end of their hearing range and may modify their movements or behavior according to the perceived sound.

A study analyzing small boat noise levels at a reference distance of one meter from the sound source indicated that boat noise at high engine speeds is wide-band and of high intensity. The same study using an underwater hydrophone array in Puget Sound, Washington, found that source-level noise produced by small boats varies from 141 dB to 161 dB re 1 µPa and the broadest frequency range observed was between 0.86 kHz to 8.0 kHz (Galli et al. 2008). Whether turtles modify their behavior or habituate to disturbance associated with vessel noise is unknown. It is likely that turtles are affected to some extent by vessel noise, given the frequency bandwidths presented by Galli et al. (2008) that overlap the auditory detection capabilities of sea turtles.

### 3.10.2.1.4 Disturbance – Behavioral Responses to Acoustic Energy

Given the sound levels and frequency bandwidths that are capable of being detected by green sea turtles, it is likely turtles make behavioral adjustments to differing noise levels and frequencies. Research regarding behavioral modification due to sound is limited and the majority of investigations regarding hearing in sea turtles have been focused on the frequency hearing range of individual species. The opportunity for an animal to respond appropriately to an approaching source of danger is constrained by how soon the animal can detect the danger. Contemporary knowledge of the sensory biology of marine turtles (Moein Bartol & Musick 2003) indicates that sound and light offer potential cues for detecting an approaching vessel. The ability of marine turtles to hear underwater sound has been confirmed by measuring their auditory brainstem responses (Ketten & Bartol 2006) and by observations of their behavioral responses to sound (Moein 1994, Lenhardt 1994). The low frequency range of turtle hearing (Ridgeway et al. 1969, O'Hara & Wilcox 1990, Lenhardt 1994, and Ketten & Bartol 2006) lies well within the broad frequency spectrum of noise produced by vessels (Richardson et al. 1995). Yet despite turtles' known auditory capacity, several factors mitigate against their reliance on sound cues.

The direction of an underwater sound source is difficult to identify because of complex propagation characteristics of sound underwater (Richardson et al. 1995). In addition, marine areas heavily used by humans, such as San Diego Bay, are subject to noise from numerous vessels, as well as other anthropogenic sources above and below the surface, which would tend to mask individual sounds. Hazel (2007) inferred that sound would have minimal utility for submerged turtles in identifying a mobile threat; the study suspected that turtles would tend to habituate to vessel sounds as background noise. However, if turtles relied primarily on sound cues, higher response rates would be predicted for faster approaches—louder engine noise at higher speed—the converse of Hazel (2007) results.

Turtle sightings within San Diego Bay are extremely rare and are most common within the south San Diego Bay, where they have been documented to reside and forage, according to McDonald and Dutton

(1992). Tagging studies by NMFS documented that turtles within San Diego Bay move within a much larger area than previously thought, including transiting high vessel traffic areas such as the turning basin within north central San Diego Bay. With the increased vessel traffic within San Diego Bay over the last 30 years, and the consistent population of turtles known to reside in San Diego Bay, the frequency of vessel strikes would be higher; however, turtles actively avoid vessels or noise attributed to such vessels by swimming towards the surface—their standard fleeing response.

Disturbance includes a variety of effects, including subtle changes in behavior, more conspicuous changes in activities, and displacement. Lenhardt (1994) and Hazel (2007) stated that marine turtles resting on the bottom swim to the surface as the standard responses to noise from vessels and sound impulse within their hearing range. Based on NMFS (2001) and National Research Council (NRC 2005) studies, the assumption is that simple exposure to sound, or brief reactions that do not disrupt behavioral patterns in a potentially adverse manner—a manner that might have deleterious effects to the well-being of individual turtles or their populations—do not constitute adverse effect.

Reactions to sound, if any, depend on species, state of maturity, experience, current activity, reproductive state, time of day, and many other factors. If a turtle does react briefly to a sound by changing its behavior or moving a small distance, the impacts of the change are unlikely to be adverse to the individual, let alone the stock or the species as a whole. However, if a sound source displaces turtles from an important feeding or breeding area for a prolonged period, impacts on the animals could be sufficient to warrant effect.

To what extent turtles utilize hearing to locate prey, navigate, or avoid interactions is subjective; however, with consideration of the infrequency in which turtles are sighted within San Diego Bay, and the location they choose to reside, it seems turtles actively avoid disturbances related to human activities or have habituated to existing noise conditions to a degree that they remain resting below the sea surface; thus reducing their potential interaction with surface activities. As turtles are not documented to use hearing to locate prey or navigate, it is unlikely that masking from background noise attributed to urbanization or vessel traffic has adverse effects on turtle behavior or foraging.

Given the many uncertainties in predicting the quantity and types of impacts of noise on turtles, it is common practice to estimate how many turtles are present within a particular distance of training activities, or exposed to a particular level of sound. The green sea turtle population in San Diego Bay is estimated at between 30 and 100 individuals depending on the time of year. Green turtles would be expected to interface with training activities infrequently, taking into account the resident turtles' affinity for warm water concentrated in south San Diego Bay during the winter months (Macdonald et al. 1990; Eckert 2002 and Dutton 1998) and assuming a direct migration path from offshore areas to south central San Diego Bay during summer months. Large motorized vessels transiting primarily offshore areas or navigational channels within San Diego Bay are unlikely to collide with turtles, since vessel movements are at moderate speed and maintain a consistent heading. Small motorized vessels have a greater potential for interacting with turtles due to their speed and erratic navigation patterns. Effects from vessel movements are difficult to quantify, given the variation in reported strandings/deaths attributed to vessel strikes (McDonald and Dutton 1992, NMFS 2009). Based on the total area of San Diego Bay (15,694 acres) and the limited amount of area the oceanside training areas encompass (6,492 acres), relative to the adjacent nearshore environment, the possibility of training activities affecting green sea turtles is low. Bayside training areas account for a total of 1,883.5 acres or 12 percent of the total area available for turtles in San Diego Bay. Assuming that resident turtles remain in south San Diego Bay when resting and are randomly distributed throughout San Diego Bay when foraging 12 percent of the population, between 3.6 and 12.0 turtles, could be present within all bayside training areas during foraging times.

Given that the majority of green sea turtles forage within shallow, subtidal areas where their primary food sources occur; and given that a routine dive ranges from 9 to 23 minutes (Brill et al. 1995), turtles spend a very small time (approximately 6 minutes of every hour based on minimum dive times) at the surface—where they are most likely to be affected by motorized vessels. Furthermore, given the fact that turtle foraging has been shown to be biased toward evening hours, an even smaller percentage of turtles have potential to interact with daytime vessel activities. Marine vessel activities are concentrated outside primary turtle foraging habitat (shallow water less than 12 feet below Mean Lower Low Water [MLLW]), based the proportion of habitat (< -12 feet MLLW) within each bayside training area (see Figure 3.7-3). Marine vessel activities originate from established berthing locations and transit areas of moderately deep and deep subtidal < -12 feet MLLW) to prescribed locations. Therefore, it is unlikely that Navy vessel traffic alone would cause disturbance (e.g., strikes, noise, etc) sufficient to determine a measurable effect to green sea turtles.

#### 3.10.2.1.5 Habitat Modification

Pacific green sea turtles are not documented to require any defined habitat within San Diego Bay or the ROI to maintain their existence or residency. Recent studies investigating movement and foraging patterns indicate that a much greater portion of San Diego Bay may be used by resident turtles than previously thought. The turtle's current and historic use of south San Diego Bay channels is correlated to temperature, considering the shallow depths, solar heating, and lack of circulation that occurs within that area. Effects to San Diego Bay substrate or eelgrass (to what extent turtles within San Diego Bay utilize eelgrass as a primary source of food is subject to debate) from training activities have a low probability of adversely impacting turtles within the ROI.

### 3.10.2.2 No Action Alternative

This section focuses on groups of activities that have potential to result in an impact to turtles. The No Action Alternative would maintain the current level and types of training that occur in the ROI. Current mitigation measures (Section 3.10.1.4) would remain unchanged. Similar types of activities are grouped together to facilitate effects analysis. Types of activities that could affect turtles include marine vessel activities, underwater detonations, and amphibious activities. In addition, beach and inland activities have been determined to have no effect on turtles in areas within the SSTC study area, as turtles are not documented to haul or nest within the ROI beaches or upland areas.

#### 3.10.2.2.1 Marine Vessel Activities

Marine vessel use in the ROI consists of self-propelled boats, propeller surface craft, and water-jet driven craft. Self-propelled craft are used for trainees to navigate in San Diego Bay and ocean water, as well as transportation to shore for raids. Under the No Action Alternative, marine vessels both mechanically driven and self-propelled are used in 41 of the 78 training activities listed in Table 2-1 and detailed in Appendix B.

Propeller surface craft are used in the ROI for a variety of purposes. These craft can be used in entirely water based activities where trainees practice navigation, mock boat attacks, and boarding drills; also, they can be used for transportation of people or equipment to shore for raids, to ensure safety of swimmers during physical fitness training, and to transport marine mammals for training. Under the No Action Alternative, training activities involve propeller and jet-driven surface craft of various size and speed. Activities occur in both San Diego Bay and oceanside training lanes, and to varying degrees craft land on beaches in both areas.

Impacts to turtles from marine vessels, both propeller-driven and jet-driven operating within the ROI include physical injury, sound, and disturbance. Since Ford (1970) documented the presence of turtles within San Diego Bay, little mortality has been attributed to vessel strikes (McDonald and Dutton 1992).

Consistent reporting of vessel strikes on turtles within San Diego Bay is lacking and vessel strike data within San Diego County indicates that nine vessel strikes have occurred between 1986 and 2008 (NMFS 2009). A portion of the most recently documented mortalities associated with vessel strikes may have occurred outside San Diego County since dominant winds tend to focus drifting debris towards San Diego Bay and the ROI. Marine vessel traffic within the ROI is concentrated near navigational channels and berthing areas, primarily occurring during daylight hours. The location and movement patterns of resident San Diego Bay green sea turtles are not well understood, which makes impacts related to marine vessel strikes difficult to quantify. The majority of marine activities occur in the offshore training lanes, and small boat training events within the ROI are a small proportion of the total activities within SSTC. Vessels taking part in activities within San Diego Bay transit through a small portion of documented turtle resting and foraging locations in the South and South Central portions of San Diego Bay. Any effects to turtles within the ROI from marine vessels remains a low probability; considering the temporal variability of both training events and turtles residing or feeding within training activity areas.

Marine vessel training activities include minimal anchoring or landing, except in defined locations or emergency situations. Eelgrass habitats are located throughout San Diego Bay, but are most heavily concentrated within the south and south central portions of San Diego Bay (Figure 3.7-2) Vessel training events are primarily within channel areas, or at slow speeds near bayside training beaches. Training events avoid eelgrass habitats because these areas can fowl running gear (propellers and jets) and affect maneuvering. Any damage to eelgrass habitats from small mechanically driven vessel activities would be temporal and localized, and would not affect entire eelgrass beds or regions. Thus, turtle habitat loss or degradation attributed to marine vessel activities would not be expected.

Impacts on turtles from noise, physical interaction, disturbance, or habitat modification, attributed to marine vessels operating within the ROI, is not anticipated to be adverse with respect to activities that involve the use of self-propelled or small, mechanically driven craft (Activities 1, 5 - 16, 18, 20 - 26, 28, 32 - 35, 37 - 39, 57, 77, 78, Table 2-1). Small, mechanically driven vessels do not emit noise levels documented to reach impacts criteria. Behavior modifications of turtles interacting with small marine vessels, both mechanically driven and self-propelled, would be infrequent considering the low population density of turtles, the documented movements within the training areas compared to the regional setting, and the temporal and spatial variability of both turtles and the individual activities. Impacts to turtles related to reduced foraging success, disturbance, or habitat modification attributed to self-propelled or small mechanically driven vessel activities, are not likely to occur based on the impacts criteria previously presented, and the short duration and spatial extent of activities within habitat documented to support turtles. Landings of small craft and personnel within bayside training areas containing eelgrass habitats may have localized and temporary impacts to resident turtles, as a result of disturbance and habitat modification. Impacts to turtles from vessel strikes, both lethal and sublethal, could potentially occur; however, impacts remain a low probability, considering previous strike data and the concentrated location of both turtles and training activities in separate areas.

Impacts on turtles from noise, physical interaction, disturbance, or habitat modification attributed to activities involving large mechanically driven vessels operating within the ROI is not anticipated to be adverse (Activities 1, 13, 20, 22, 24, 25, 27, 38, 39, 40, 41, 44, 45, 46, 49, 51, 52, 53, Table 2-1). Behavior modifications of turtles interacting with large mechanically driven vessels would be infrequent considering the low population density of turtles, the slow and deliberate nature of the vessels, and an absence of documented vessel strikes during the past decade. Reduced foraging success or behavior modification attributed to large, mechanically driven vessel activities is only likely to occur for migrating or actively moving turtles; they would not adversely affect turtles based on the findings previously presented. Landings of large vessels within bayside training areas containing eelgrass habitat may have localized and temporary impacts to resident turtles from disturbance and habitat modification because of propeller or jet scouring. The short duration and spatial extent of activities in conjunction with the small resident population of turtles greatly reduces the probability of large mechanically driven vessels interfacing with turtles. Based on the low density and high mobility of turtles, the probability of lethal and sub-lethal impacts attributed to turtle/vessel collisions is low. Given the noise and movements created from marine vessel activities, behavioral modifications sufficient to illicit measurable effect are unlikely. In accordance with ESA, marine vessel activities under the No Action Alternative may affect ESA-listed turtles.

#### 3.10.2.2.2 Underwater Detonations

Underwater detonations that take place under the No Action Alternative are detailed in Section 3.8.2.2.3 (Table 3.8-11). All detonations take place in the oceanside training lanes, designated Boat Lanes 1-14 in the table, from 0 to 72 feet of water depth depending on the activity.

Biological information describing the threshold and degree of impact to sea turtles from pressure waves and sound are not available. As such, NMFS uses marine mammal criteria. Detailed information on the thresholds for lethal and sub-lethal effect from pressure waves and sound generated from underwater detonations are described in depth in Section 3.9.2.3 and are applied to the impact analysis presented in this section. The thresholds are used to establish ZOI for injury and mortality for underwater detonations at SSTC. Table 3.10-2 provides a summary of ZOI distances for sea turtles based for each underwater detonation activity.

The frequency of turtles transiting the ROI within the nearshore coastal habitat used for underwater detonations is not currently known. Information on the number of turtles that annually migrate into San Diego Bay, the path they transit, or the frequencies at which they use nearshore waters of the ROI, are unknown, but expected to be low. Multiple scenarios can be inferred; however, without site-specific data on turtle spatial and temporal movement, probability estimates of turtles transiting the ocean portions of the ROI remains debatable.

Empirical testing performed by the NSWC/Anteon Corp., Inc. (2005) reported that underwater detonations at SSTC-N oceanside boat lanes would propagate sound, pressure, and energies differently in very shallow water (zero to 24 feet of water depth) than shallow water (24 to 72 feet of water depth). Details about this empirical testing and its results can be found in Section 3.9.2.4.2. The testing found that ZOIs for underwater detonations conducted in VSW for physiological disruption (temporary threshold shift [TTS]) for exercises with charge-weights of 20 pounds or less of C4 on the bottom is 1,200 ft.

Impacts to turtle behavior or foraging habitat from underwater detonations are not expected. There is a lack of suitable foraging habitat within SSTC-N and SSTC-S boat lanes, and a low probability of turtles transiting or residing within the activity area. Further, the Navy will implement mitigation measures (described in section 3.10.1.4), which include the use of two trained observers with binoculars and small craft surveying detonation areas and the buffer zone for at least 30 minutes prior to and after detonations. These mitigation measures would further reduce the probability of turtle impacts. In accordance with ESA, marine vessel activities under the No Action Alternative may affect ESA-listed turtles.

**Table 3.10-2: Maximum Zones of Influence for No Action Alternative**

| Underwater Detonation Operation | Charge Weight Used[1] | Season | Injury | | Mortality |
|---|---|---|---|---|---|
| | | | Onset of slight lung injury (13.0 psi-msec)[3] | 50% TM rupture (205 dB re 1µPa$^2$-sec) [3] | Onset of extensive lung injury (30.5 psi-msec) [3] |
| Mine Countermeasures | 20 | Warm | 360 | 80 | 80 |
| | | Cold | 160 | 80 | 80 |
| Floating Mine | ≤ 5 | Warm | 20 | 80 | 20 |
| | | Cold | 20 | 80 | 20 |
| Unmanned Underwater Vehicle Activities | 20 | Warm | 360 | 80 | 80 |
| | | Cold | 150 | 80 | 80 |
| Marine Mammal Systems Activities[2] | 13 | Warm | 130 | 70 | 80 |
| | | Cold | 140 | 70 | 80 |
| Marine Mammal Systems Activities | 13 | Warm | 130 | 60 | 80 |
| | | Cold | 140 | 70 | 80 |
| Very Shallow Water Mine Countermeasures | 0.1 - 20 | Warm | 360 | 80 | 80 |
| | | Cold | 150 | 80 | 80 |
| Dive Platoon[2] (mid-depth) | 3.5 | Warm | 70 | 130 | 40 |
| | | Cold | 70 | 130 | 40 |
| Dive Platoon[2] (bottom) | 3.5 | Warm | 80 | 90 | 50 |
| | | Cold | 90 | 90 | 50 |
| Mine Neutralization [2] | 3.5 | Warm | 80 | 90 | 50 |
| | | Cold | 90 | 90 | 50 |

[1] Charge weights are listed in pounds
[2] Sequential Detonations
[3] Distances are listed in yards

### 3.10.2.2.3 Amphibious and Beach Activities

Training activities in this section include amphibious vehicles, ELCAS, and fluid transfer systems. Training activities include the use of training areas within both San Diego Bay and the nearshore environment. Potential impacts from included activities range from vehicle transit within ROI waters, noise, and habitat modification, are similar to those described in Section 3.10.2.2.1, Marine Vessel Activities.

### Amphibious Activities

Amphibious vehicles and vessels are used during various training activities land on beaches and San Diego Bay shorelines that turtles may utilize during foraging. The modification of that shoreline depends on the size of the amphibious vehicle, the frequency of the landings within the area, and whether the propulsion system creates scouring during the landing activity. Amphibious activities analyzed in this section focuses on the interaction the vehicle has with the landing area and to a lesser extent the waters adjacent to the landing areas such as Craft Landing Zone (CLZ), Lighter, Amphibious, Resupply, Cargo-5 ton (LARC V), and Barge Ferry Causeway/ Coxswain Training (Activities 27 and 53, Table 2-1) as well as more intense activities associated with construction of an ELCAS.

To prepare for a LCAC ingress/egress activity, CLZ teams survey and mark beaches. The CLZ team then safely guides LCACs to the designated shore landing areas. Increased turbidity and scouring from landing activities within SSTC Boat Lanes 1-14 would not likely be sufficient to result in adverse impacts to turtles. Any impact to turtle behavior or foraging would be temporary and localized, considering the energetics of the surf zone, the extent of similar adjacent habitat, and low frequency (once per year over a 6 day period) of the activity. In San Diego Bay, increased turbidity and scouring from landing or anchoring activities such as Barge Ferry Causeway/Coxswain Training may have localized impacts to eelgrass habitats, but would not likely be sufficient to result in adverse impacts to turtles. Any impact to turtle behavior or foraging would be temporary and localized, given the extent of similar adjacent habitat and low frequency (four per year for one day) of the activity.

Causeway Pier Insertion and Retraction and ELCAS activities involve the insertion of a causeway (a temporary floating pier) onto the beach. Causeways either remain floating offshore or are elevated onto pilings driven into the sediment. Causeway activities occur primarily on SSTC-N oceanside boat training areas 1-10, but also periodically in the bayside Bravo training area. Under the No Action Alternative, these activities occur three and nine times respectively and are separate training events.

Pile driving will be conducted during installation of the ELCAS, which is constructed to provide a quick and temporary pier structure for offloading Navy vessels. Under the No Action Alternative, ELCAS activities occur twice a year and occur either bayside at Bravo Beach, or oceanside at SSTC-North. Pile installation occurs over a period of 10 days. Approximately 101 piles are driven in a typical ELCAS training event, with around 250 to 300 impacts per pile, and each pile taking on average 10 minutes to install. Pile driving is done 24 hours-per-day; floodlights are used at night, which would illuminate the surrounding area. At the end of the training, a vibratory extractor attached to the pile head will be used to remove piles. Removal takes approximately 15 minutes per pile over a period of around 3 days. As discussed in Section 3.10.1.4, pile driving includes a semi-soft start. The pile driver increases impact strength as resistance goes up. At first, the pile driver piston drops a few inches. As resistance goes up, the pile driver piston will drop from a higher distance providing more impact due to gravity.

Shock pulses from pile driving have the potential to affect turtles—if they are in the immediate area. Depending on the level of the sound and shockwaves produced by pile driving activities and the proximity turtles transit to the activities, various lethal and sublethal impacts may occur. Shockwaves and peak pressures generated from ELCAS pile driving activities could reach between 188 and 208 dB re 1 $\mu Pa^2$-s. There is no established criterion for injury or mortality from pile driving activities associated with sea turtles; however, marine mammal criteria may conservatively address sea turtles like they do for underwater detonation activities. Section 3.9.2.3 details the buffer zones used to mitigate the impacts of ELCAS pile driving activities on sea turtles.

Given the complexity and magnitude of associated logistical aspects of ELCAS and the soft start of the pile driving activities, if turtles are present within the activity area, they will likely leave prior to full-impact pile driving activity. Additionally, mitigation measures in place (Section 3.10.1.4) would allow for the detection of sea turtles in the immediate vicinity prior to initiating pile driving activities and it would offset potential exposure to turtles within the activity footprint.

Given the infrequency of these activities, and the duration between driving piles within a high-energy surf zone, impacts to turtles within the offshore boat lanes are expected to be temporary and localized. Impacts to turtles, with regard to habitat modification within Bravo, can be more precisely defined based on loss or modification of eelgrass habitat described in Section 3.7. Only a small percentage of all piles being driven would occur within eelgrass habitat and eelgrass. Bravo lane eelgrass habitat represents only 17.5 acres (using 2004 coverages listed in Table 3.7-3). Furthermore, ELCAS training activities take place within a defined training lane within Bravo, 1.13 acres, and potential loss of eelgrass habitats will be mitigated for as discussed in Section 3.7. In summary, ELCAS activities are performed infrequently, and in most cases within an already physically challenging surf zone habitat, or designated location within the Bravo training lane. Impacts to turtles would be concentrated in proximity to pile driving activities and most notably within eelgrass habitat. Given the extent of adjacent habitat and population of turtles known to exist in adjacent habitat, effects to turtles from ELCAS activities are expected to be temporary and localized. Based on the limited occurrence and constrained nature of amphibious activities within turtle foraging areas, and the low density of turtles, the probability of impacts to turtles is low. In accordance with the ESA, amphibious activities in the No Action Alternative may affect ESA-listed turtles.

### Beach Activities

Beach activities covered in this section involve activities that transfer fuel (simulated) or water from vessels on the water to beaches within training areas. The focus of the analysis for the applicable activities is concentrated on the type of medium being transferred and the nearshore waters or intertidal areas that may be affected by equipment movement or positioning. Impacts from marine vessel movements or landings are address in Section 3.10.2.2.1. Fluid transfer training events involve two activities (1) the simulation of fueling transfers utilizing seawater and (2) the intake of seawater for desalination and the discharge of hypersaline brine back into San Diego Bay.

Fluid transfer activities consist of transferring salt water to simulate fuel transfer, under the activities Offshore Petroleum Discharge System (OPDS) and Amphibious Bulk Liquid Transfer System (ABLTS), and bringing saltwater ashore for desalinization, under the activity ROWPU. For both activities, water is pumped to a beach interface unit and returned to the ocean with a hose. Simulated fueling transfer during OPDS poses minimal risk to turtles due to its localized nature and infrequent use. During ROWPU training, salt water is brought ashore and desalinized. Hypersaline water is then stored in a bladder and transported offsite for sewerage or mixed with potable water and discharged back into the sea at nearly the same salinity as the source ocean water. Discharge of treated water is not likely to affect turtles, considering the diluted nature of the discharge, the dissolution from the receiving water, and physical mixing that occurs within the surf zone and nearshore waters where activities occur. Any physical impacts to turtles would be temporary and localized as training activities occur infrequently. Impacts from fluid transfer activities including, habitat modification, and entrainment in the OPDS/ABLTS systems, and effects to turbidity would not be expected to have lethal or sublethal impacts to turtles due to the small area impacted and low likelihood of sea turtle presence. In summary, no long term adverse impacts would occur from fluid transfer activities and any impact to turtles would be unlikely. In accordance with the ESA, beach activities in the No Action Alternative may affect ESA-listed turtles.

## 3.10.2.3 Alternative 1 (Preferred Alternative)

Alternative 1 increases the current level and types of training that occur in the ROI. Current mitigation measures would remain unchanged (Section 3.10.1.4). This section focuses on groups of activities that have potential to result in an impact to specified turtle species. As discussed previously, similar types of activities are grouped together to facilitate impacts analysis.

#### 3.10.2.3.1 Air Activities

As presented in Chapter 2 (see Tables 2-1 and 2-2) and detailed in Appendix B, helicopter activities over San Diego Bay and ocean waters within the ROI would more than double under Alternative 1 in comparison to the No Action Alternative. Given that impacts to turtle species from air activities are not expected from noise and sea surface disturbance, the increase in Air Activities would not measurably change the potential impact to green sea turtles or their populations.

One new air activity utilizing helicopters would use a Light Detection and Ranging (LIDAR) blue-green laser to detect, classify, and localized floating and near-surface mines in shallow water (Activity N5, see Table 2-2) and would be added under Alternative 1. Brudenall (2008) reports that the leatherback sea turtle shows ocular features that are characteristic of Chelonians with similarities to aquatic mammals. The calculated optical sensitivity suggests that compared to pelagic fish, for instance, the leatherback sea turtle eye is not particularly well adapted for vision in dim light even though this species is known to venture into deep, dark waters, and might feed at night. Further, Zorn et al. (1998) concluded oceanographic LIDARs that meet current human laser safety standards will have no harmful impacts on the eyes of cetaceans or pinnipeds, and sea turtles, because the human eye is more sensitive to laser radiation than either the cetacean eye or the pinniped eye. As LIDAR activities are dispersed across the oceanside boat lanes of the ROI, where the expected density of green sea turtles is extremely low, the use of LIDAR would pose a minimal risk to sea turtles. In accordance with ESA, air activities under Alternative 1 may affect ESA-listed turtles.

#### 3.10.2.3.2 Marine Vessel Activities

Marine vessels, propeller and water-jet driven, would increase in use and scope under Alternative 1 compared to the No Action Alternative as presented in Chapter 2 (Tables 2-1 and 2-2) and detailed in Appendix B. Any increases in marine vessel use in both oceanside and bayside training areas would result in a commensurate increase the probability of impact on turtles from disturbance and physical injury, though the anticipated level of impact from these activities is expected to remain low. The greatest increases to marine vessel activities would be attributed to new activities: Shock Wave Action Generator (SWAG, N1), Surf Zone Test Detachment (N2) as well as increases to existing activities, Seal Delivery System/Advanced SEAL Delivery System (SDV/ASDS) Cert training, and Barge Ferry/Causeway Coxswain training.

New activities under Alternative 1 will take place within all boat training lanes and bayside training areas. Large and small mechanically driven vessels are used to support diving activities within boat lanes and bayside training locations. Sound levels from transiting vessels may illicit behavior modification of turtles based on documented sound levels and developed impact criteria (see Table 3.10-1). Vessel strikes and behavior modifications related to vessel movement or towed systems may occur; however, impacts would be more likely to occur in San Diego Bay training areas than ocean boat lanes, though vessel training events in San Diego Bay are primarily within channel areas or at slow speeds near bayside training beaches. This is based on the proximity of bayside training areas to known turtle resting and foraging areas and the low probability of activities in ocean boat lanes interacting with migrating turtles. Impacts would be infrequent based on the current documented vessel strike frequency data as well as the concentration of marine vessel and towed systems in oceanside beach lanes where sea turtle occurrence is low. As such, impacts to sea turtles would be similar to those presented under the No Action Alternative. Based on the low density and high mobility of turtles relative to the increase in marine vessel activities proposed in Alternative 1, the probability of lethal and sub lethal impacts attributed to turtle/vessel collisions is low. Given the increased noise and movements created from marine vessel activities proposed in Alternative 1, behavioral modifications sufficient to illicit measurable effect are unlikely. In accordance with ESA, marine vessel activities under Alternative 1 may affect ESA-listed turtles.

### 3.10.2.3.3 Underwater Detonations

All underwater detonation training activities occur on the ocean side of SSTC within the designated boat lanes, with the exception of small charge weight (0.033 lb) SWAG within the open waters of south San Diego Bay. In general, 78% of the annual SSTC underwater detonations include underwater charges less than 10 lbs. NEW. As presented and described in Section 3.8.2.3.3 (Table 3.8-11), underwater detonations would increase measurably in frequency from 103 activities under the No Action Alternative to 311 activities under Alternative 1 and in magnitude from 20 pounds for the No Action Alternative to 29 pounds for Alternative 1 and 2. The increase in the weight of the underwater detonation charges to 29 pounds NEW would not increase the potential area of effect (harassment or injury) from beyond 360 yards (1,080 ft) from a single detonation based on Goertner's modified impulse pressure at the surface of 13 psi-ms for slight lung injury SLI (Table 3.10-3). Because the distance of potential impact was unchanged and the number of activities increases under Alternatives 1 and 2, underwater detonations would not be expected to result in lethal or sublethal effects to green sea turtles based on current impacts criteria previously outlined in Section 3.10.2.1.2 and the use of existing mitigation measures (Section 3.10.1.4). Increases to the size and frequency of detonations may have adverse impacts on turtles.

Under Alternative 1, five additional activities would be conducted: SWAG and Unmanned Underwater Vehicle (UUV) Neutralization, Airborne Mine Neutralization System (AMNS), Demolition Requalification and Training/Underwater Detonations, and Naval Special Warfare (NSW) Underwater Demolition Training (Activities N1, N3, N7, N9, and N11, respectively, Table 2-2) and the footprint of activities would be expanded to include SWAG detonations of up to 15 grams NEW within San Diego Bay.

SWAG (Activity N1, Table 2-2) is a new activity under Alternative 1 that would take place within all boat training lanes and Echo bayside training area. SWAG is a tool used to disarm enemy limpet mines, which have been attached to the hull of a ship. The SWAG is composed of a cylindrical steel tube, three inches long and one inch wide, containing approximately 15 grams NEW of explosives which has a minimal zone of influence (ZOI) (Table 3.10-3). For SWAG training, a metal sheet containing an inert limpet mine is lowered from the side of a small vessel. Divers go below and place a single SWAG on the mine mid-water column at water depths of 10 to 20 feet. The presence of SCUBA divers elicits a fleeing response in sea turtles (Bowen 2007). Given the size of the charge utilized in this activity, current and proposed mitigation measures, and the substantial time required to setup the activity, adverse impacts to turtles from the SWAG activity are unlikely.

UUV Neutralization (Activity N3, Table 2-2) is a new activity under Alternative 1 that would take place within SSTC Boat Lanes 1-14. Training activities consist of placing sequential charges, consisting of a Seafox (3.3 pounds) or Archerfish (3.57 pounds) charge placed from depths of ten feet to the bottom in water depths less than 72 feet. Given the size of the charge utilized in this activity, current mitigation measures, and the substantial time required to setup the activity, impacts to turtles would be similar to those described in 3.10.2.2.2 and are unlikely.

AMNS (Activity N7, Table 2-2) is a new activity under Alternative 1 that would take place within SSTC Boat Lanes 1-14. Training consists of deployment of AMNS underwater vehicle that searches for, locates, and destroys mines. The vehicle is self-propelled and unmanned. Ten of the 48 annual activities culminate in the AMNS being remotely detonated when it encounters a simulated (inert) mine shape. The charge contained within the AMNS underwater vehicle is 3.52 pounds NEW. Helicopter crews continuously scan the water surface of the activity area for obstructions that could affect towing activities. As such, this continuous scan serves as an effective pre-detonation monitoring for any sea turtle that may be near the activity area. Given this operating procedure, the size of the charge utilized in this activity, the location of the activity in where sea turtle density is anticipated to be extremely low, and the substantial time required to setup the activity, impacts to turtles would be similar to those described in 3.10.2.2.2 and are unlikely.

**Table 3.10-3: Maximum Zones of Influence Under Alternative 1 and 2**

| Underwater Detonation Operation | Charge Weight Used[1] | Season | Injury: Onset of slight lung injury (13.0 psi-msec)[2] | Injury: 50% TM rupture (205 dB re 1μPa²-sec)[2] | Mortality: Onset of extensive lung injury (30.5 psi-msec)[2] |
|---|---|---|---|---|---|
| Mine Countermeasures | 20 | Warm | 360 | 80 | 80 |
| | | Cold | 160 | 80 | 80 |
| Floating Mine | 5 | Warm | 20 | 80 | 20 |
| | | Cold | 20 | 80 | 20 |
| SWAG | 0.033 | Warm | 0 | 0 | 0 |
| | | Cold | 0 | 0 | 0 |
| Unmanned Underwater Vehicle Activities | 15 | Warm | 360 | 80 | 80 |
| | | Cold | 150 | 80 | 80 |
| Marine Mammal Systems Activities (sequential) | 29 | Warm | 360 | 140 | 90 |
| | | Cold | 170 | 140 | 90 |
| Marine Mammal Systems Activities | 29 | Warm | 360 | 100 | 90 |
| | | Cold | 170 | 100 | 90 |
| Dive Platoon (sequential) | 3.5 | Warm | 80 | 90 | 50 |
| | | Cold | 90 | 90 | 50 |
| Qual/Cert (sequential) | 13.75 | Warm | 140 | 100 | 80 |
| | | Cold | 140 | 100 | 80 |
| Qual/Cert | 25.5 | Warm | 300 | 90 | 90 |
| | | Cold | 170 | 90 | 90 |
| Mine Neutral (sequential) | 3.5 | Warm | 80 | 90 | 50 |
| | | Cold | 90 | 90 | 50 |
| UUV Neutral (sequential) | 3.57 | Warm | 80 | 60 | 50 |
| | | Cold | 90 | 60 | 50 |
| AMNS | 3.5 | Warm | 80 | 40 | 40 |
| | | Cold | 80 | 40 | 40 |

[1] Charge weights are listed in pounds
[2] Maximum ZOIs are listed in yards
Most training events are a single detonation per event. However, several training activities involve sequential charges during the same training event. Unless otherwise specified, all sequential charges are conducted either less than 10-seconds apart or greater than 30-minute apart.

Demolition Requalification and Training/Underwater Detonations (Activity N9, Table 2-2) is a new activity under Alternative 1 that would take place within all boat training lanes. Training consists of requalifying or training teams in underwater detonations by conducting detonations on metal plates near the shore. Additionally, at depths of 10 to 72 feet, two sequential 12.5 to 13.75-pound charges are placed on the bottom or a single 25.5-pound charge is place from a depth of 20 feet to the bottom. Given the size of the charge, the location of the activity, current mitigation measures, and the substantial time required to setup the activity, impacts to turtles would be similar to those described in 3.10.2.2.2 and are unlikely.

NSW Underwater Demolition Training (Activity N11, Table 2-2) is a new activity under Alternative 1 would be conducted within all training lanes. Up to 40 persons participate in the activity, which involves small groups swimming to shore from four inflatable boats located approximately 1,000 yards offshore; boats may be beached on shore. A single charge of less than 10 pounds of C-4 explosives (if detonated on the bottom) or less than five pounds(if within five feet of the surface) is command detonated near the shoreline in water less than 24 feet deep. Impacts to turtles from underwater detonations within waters of the ROI are based on modeling and tests (DoN 2001a: Goertner, 1982). The radius of lethal and sublethal effect to turtles from impulse waves is solely based on peak pressure presented in Table 3.10-1 and the maximum size of the detonation known to take place for each activity. Given that nearly all SSTC underwater detonations occur in nearshore Boat Lanes 1-14, over mostly sand bottom not documented to support foraging or transient turtles, that the density of sea turtles in the training area is low, and use of mitigation measures to minimize the potential for impacts to turtles (Section 3.10.3), the probability of impacts to sea turtles is low. If impacts to turtles do occur, they would likely be behavioral and considered localized and temporary. In accordance with ESA, underwater detonation activities under Alternative 1 may affect ESA-listed turtles.

### 3.10.2.3.4 Amphibious and Beach Activities

### Amphibious Activities

As described in Section 3.10.2.2.3, ELCAS activities are not expected to have adverse impacts to turtles, given the complexity and magnitude of associated logistical aspects of ELCAS. The majority of turtles within the activity area are likely to be displaced prior to pile driving activity due to setup activities, or displaced during the soft start process of pile driving. Shock waves and peak pressures generated from ELCAS pile driving activities would be expected to produce shock waves sufficient to reach impacts criteria for the onset of slight lung injury; however, the small ZOI combined with existing mitigation measures for turtles (Section 3.10.1.4) are likely to reduce the potential for impact. Impacts from ELCAS activities including sound, shock waves, habitat modification, and increased turbidity could have impacts to turtles foraging in adjacent eelgrass areas, though these impacts would be temporary and localized. Suspended material from pile driving within the oceanside training areas would not substantially modify the surf zone or nearshore clarity to a degree expected to affect turtles behavior or foraging. In contrast, increased turbidity and the potential redistribution of sediment from pile driving may have adverse impacts to eelgrass habitat from smothering that could have secondary effects to turtle foraging. Based on the limited occurrence and constrained nature of amphibious activities within turtle foraging areas and the low density of turtles, the probability of impacts to turtles is low. In accordance with the ESA, amphibious activities in Alternative 1 may affect ESA-listed turtles.

### Beach Activities

Increases in beach activities not discharging by-products or interfacing with the nearshore or San Diego Bay waters have no potential to affect turtles and are not analyzed in this section. Beach activities that may affect the nearshore environment are discussed in this section. Fluid transfer training events involve two activities (1) the simulation of fueling transfers utilizing seawater and (2) the intake of seawater for desalination and the discharge of hypersaline brine back into San Diego Bay. Fluid transfer activities consist of transferring salt water to simulate fuel transfer, under the activity OPDS, ABLTS, and bringing saltwater ashore for desalinization, under the activity ROWPU. Under Alternative 1 the total number of annual activities would increase from four to five.

As described in Section 3.10.2.2.3, fluid transfer training events are expected to have a minimal effect on turtles, and the incremental change in the number of activities would not change those predictions. Surface coverage by conduit is not sufficient to affect behavior of turtles. Bottom substrate disturbance or modification within the surf zone, or intertidal areas attributed to equipment or sand movement would occur within an already physically disturbed zone. Modification of habitat within the San Diego Bay would be proportional to the amount of lost eelgrass habitats. Any impact to turtles within the boat lanes would be below measurable thresholds, and would only be expected in the San Diego Bay if eelgrass habitats were modified or destroyed to a sufficient level to reduce foraging success.

### 3.10.2.4 Alternative 2

Implementation of Alternative 2 would increase the overall training to the same level as Alternative 1. Implementation of Alternative 2 would also include the introduction of new types of training; conducting existing routine training at additional locations within SSTC established training areas, and increasing access to, and availability of, existing beach and inland training areas. The only difference between Alternative 1 and 2 is that all SSTC-N beach training areas would be available for use, regardless of time of year. Therefore, impacts associated with Alternative 2 would be the same as those described above for Alternative 1. Under Alternative 2, the proposed change to access and availability to existing beach and inland training areas would not result in a change in impacts to sea turtles over Alternative 1. Under Alternative 2, training activities would result in similar effects to sea turtles as previously described under Alternative 1.

## 3.10.3 Proposed Mitigation Measures

Given implementation of the current mitigation measures for SSTC activities (described in detail in Section 3.10.1.4), there would be minimal impacts to sea turtles under any of the alternative activities considered in this EIS.

Mitigation procedures for oceanside underwater detonations would remain the same as described in Section 3.10.1.4. In addition, the Navy would implement mitigation measures for underwater detonations involving SWAG, which are proposed in Alternative 1 and 2, but are not currently conducted:

1. A buffer zone of 60 yards (180 feet) will be established around each SWAG detonation point.
2. Observer(s) with binoculars and small craft will survey the detonation area and the buffer zone for sea turtles from at least 10 minutes prior to commencement of the scheduled explosive event until at least 10 minutes after detonation. Observers will pay extra attention within the buffer zone to large amounts of floating kelp strands and other marine debris (if any), since these may provide shelter and food for sea turtles.
3. Divers placing charges on mines and dive support vessels will check the area immediately around the mine location for sea turtles.
4. If a sea turtle is sighted within the buffer zone or moving towards it, exercises will be suspended until the animal has voluntarily left the area and the area is clear of sea turtles for at least 10 minutes.
5. Immediately following SWAG detonation, visual monitoring for sea turtles within the buffer zone will continue for 10 minutes. Any animals appearing following a detonation will be observed for

signs of injury. Injured sea turtles will be reported to the Commander Navy Region Southwest (CNRSW) Environmental Director, the Pacific Fleet (PACFLT) Environmental Office, and National Marine Fisheries Service (NMFS) Southwest Regional Office. An existing Standing Communication Tree for the Southern California Range Complex has been formally approved by NMFS and the Navy. Using this protocol, the Navy will report all sea turtle strandings observed by Navy personnel immediately to NMFS or as soon as clearance procedures allow, to the practical extent possible.

As a result of the informal green sea turtle consultation with NMFS, the Navy will implement an additional mitigation measure:

1. If there are sea turtles known to be equipped with sonic tags in the area of and during pile driving operations, Navy will collaborate with NMFS to analyze movements of these turtles in the immediate area during pile driving. Following any monitoring of sound attenuation associated with pile driving, the Navy will share the results with NMFS and provide recalculations of buffer zones as they are available.

Current mitigation measures implemented during ELCAS pile driving are described in detail in Section 3.10.1.4 and would continue.

### 3.10.4 Unavoidable Adverse Environmental Effects

There are no unavoidable adverse environmental effects to sea turtles as a result of implementation of any alternatives.

### 3.10.5 Summary of Effects

Table 3.10-4 presents a summary of effects and mitigation measures for the No Action Alternative, Alternative 1, and Alternative 2. All alternatives avoid effects on turtles and their preferred habitats. The Navy, based on the assessment provided above, believes that the proposed action on SSTC may affect but is not likely to adversely affect the federally listed turtle species found within SSTC. In accordance with ESA requirements, the Navy has completed informal consultation under Section 7 of the ESA with NMFS. NMFS has concurred that with implementation of mitigation measures, the Proposed Action may affect, but is not likely to adversely affect, ESA-listed species and has signed a letter of concurrence on 19 November, 2010. A full description of the informal green sea turtle consultation process is provided in Chapter 6 and Appendix G provides a list of the SSTC informal consultation documentation. Agency correspondence and supporting documentation can be found on the SSTC EIS website at www.silverstrandtrainingcomplexeis.com.

**Table 3.10-4: Summary of Effects**

| Alternative | Effects |
|---|---|
| **No Action Alternative** | • Underwater detonations, vessel strikes, and noise associated with marine vessels and pile driving are unlikely to adversely impact sea turtles due to their rarity in the SSTC, the concentration of activities in ocean boat lanes, and implementation of mitigation measures.<br>• Training activities under the No Action Alternative may affect, but is not likely to adversely affect, ESA-listed turtles. |
| **Alternative 1** | • Training tempo would increase; however, impacts are expected to be substantially the same as the No Action Alternative.<br>• Training activities under Alternative 1 may affect, but is not likely to adversely affect, ESA-listed turtles. |
| **Alternative 2** | • Training tempo would increase; however, impacts are expected to be substantially the same as the No Action Alternative.<br>• Training activities under Alternative 2 may affect, but is not likely to adversely affect, ESA-listed turtles. |
| **Mitigation Measures** | Mitigation measures for very shallow water (VSW) underwater detonations on SSTC oceanside (0-24 feet):<br>• Easily visible anchored floats will be positioned on a 1,200 foot or 400 yard radius of a roughly semi-circular zone (the shoreward half being bounded by shoreline and immediate off-shore water) around the detonation location for small explosive exercises at the SSTC. These mark the outer limits of the mitigation zone.<br>• For each VSW underwater detonation event, a safety-boat with a minimum of one observer is launched 30 or more minutes prior to detonation and moves through the area around the detonation site. The task of the safety observer is to exclude humans from coming into the area and to augment a shore observer's visual search of the mitigation zone for sea turtles. The safety-boat observer is in constant radio communication with the exercise coordinator and shore observer discussed below.<br>• A shore-based observer will also be deployed for VSW detonations in addition to boat based observers. The shore observer will indicate that the area is clear of sea turtles after 10 or more minutes of continuous observation with no sea turtles having been seen in the mitigation zone (1,200 feet or 400 yards) or moving toward it.<br>• At least 10 minutes prior to the planned initiation of the detonation event-sequence, the shore observer, on an elevated on-shore position, begins a continuous visual search with binoculars of the mitigation zone. At this time, the safety-boat observer informs the shore observer if any sea turtle has been seen in the zone and, together, both search the surface within and beyond the mitigation zone for sea turtles.<br>• The observers (boat and shore based) will indicate that the area is not clear any time a sea turtle is sighted in the mitigation zone or moving toward it and, subsequently, indicate that the area is clear of sea turtles when the animal is out and moving away and no other sea turtles have been sited.<br>• Initiation of the detonation sequence will only began on final receipt of an indication from the shore observer that the area is clear of sea turtles and will be postponed on receipt of an indication from that any observer that the area is not clear of sea turtles.<br>• Following the detonation, visual monitoring of the mitigation zone continues for 30 minutes for the appearance of any sea turtle in the zone. Any sea turtle appearing in the area will be observed for signs of possible injury. |

**Table 3.10-4: Summary of Effects (Continued)**

| Alternative | Effects |
|---|---|
| **Mitigation (Continued)** | • Any sea turtle observed after a VSW underwater detonation either injured or exhibiting signs of distress will be reported to Navy environmental representatives from the regional Navy shore commander (Commander, Navy Region Southwest) and U.S. Pacific Fleet, Environmental Office, San Diego Detachment. The Navy will report these events to the Stranding Coordinator of NMFS' Southwest Regional Office using Marine Mammal Stranding communication trees and contact procedures established for the Southern California Range Complex. These voice or email reports will contain the date and time of the sighting, location (or if precise latitude and longitude is not currently available, then the approximate location in reference to an established SSTC beach feature), species description (if known), and indication of the animal's status.<br><br>Mitigation measures for shallow water underwater detonations on SSTC oceanside (24-72 feet):<br>• A mitigation zone of 1,500 feet or 500 yards will be established around each underwater detonation point.<br>• A minimum of two boats, including but not limited to small zodiacs and 11-meter Rigid Hulled Inflatable Boats (RHIB) will be deployed. One boat will act as an observer platform, while the other boat is typically the diver support boat.<br>• Two observers with binoculars on one small craft\boat will survey the detonation area and the mitigation zone for sea turtles from at least 30 minutes prior to commencement of the scheduled explosive event and until at least 30 minutes after detonation.<br>• In addition to the dedicated observers, all divers and boat operators engaged in detonation events can potentially monitor the area immediately surrounding the point of detonation for sea turtles.<br>• If a sea turtle is sighted within the 1,500 foot or 500 yard mitigation zone or moving towards it, underwater detonation events will be suspended until the sea turtle has voluntarily left the area and the area is clear of sea turtles for at least 30 minutes.<br>• Immediately following the detonation, visual monitoring for sea turtles within the mitigation zone will continue for 30 minutes. Any sea turtles observed after an underwater detonation either injured or exhibiting signs of distress will be reported to Navy environmental representatives from the regional Navy shore commander (Commander, Navy Region Southwest) and U.S. Pacific Fleet, Environmental Office, San Diego Detachment. The Navy will report these events to the Stranding Coordinator of NMFS' Southwest Regional Office stranding coordinator using Marine Mammal Stranding communication trees and contact procedures established for the Southern California Range Complex. These voice or email reports will contain the date and time of the sighting, location (or if precise latitude and longitude is not currently available, then the approximate location in reference to an established SSTC beach feature), species description (if known), and indication of the animal's status. |

**Table 3.10-4: Summary of Effects (Continued)**

| Alternative | Effects |
|---|---|
| **Mitigation (Continued)** | Mitigation for ELCAS/Pile Driving Activities on SSTC oceanside:<br>• A mitigation zone will be established at 150 feet or 50 yards from ELCAS pile driving and pile removal events. This mitigation zone is based on the predicted range to Level A harassment (180 dB RMS) for cetaceans, and is being applied conservatively to sea turtles.<br>• Monitoring will be conducted within the 150 foot or 50 yard mitigation zone surrounding ELCAS pile driving and removal events for the presence of sea turtles before, during, and after pile driving and removal events<br>• If sea turtles are found within the 150 foot or 50 yard mitigation zone, pile removal events will be halted until the sea turtles have voluntarily left the mitigation zone.<br>• Monitoring for sea turtles will take place concurrent with pile removal events and 30 minutes prior to pile driving and removal commencement. A minimum of one trained observer will be placed on shore, on the ELCAS, or in a boat at the best vantage point(s) practicable to monitor for sea turtles.<br>• Monitoring observer(s) will implement shut–down/delay procedures when applicable by calling for shut–down to the hammer operator when sea turtles are sighted within the mitigation zone.<br>• Soft Start - Providing additional protection for sea turtles, ELCAS pile driving includes a soft start as part of normal construction procedures. The pile driver increases impact strength as resistance goes up. At first, the pile driver piston drops a few inches. As resistance goes up, the pile driver piston will drop from a higher distance thus providing more impact due to gravity. This will allow sea turtles in the project area to vacate or begin vacating the area minimizing potential harassment. The ELCAS soft start is not the traditional soft-start used in bigger civilian construction projects, and doesn't include a waiting period (an initial set of several strikes from the impact hammer at 40-60 percent energy levels, followed by a one minute waiting period, then two subsequent 3 strike sets), but does provide additional time for sea turtles to vacate the area. Including waiting periods as part of training would be inconsistent with Navy training objectives that requires the ELCAS to be constructed as quickly as possible in real world conditions to ensure rapid supply of equipment and materials to shore in a hostile territory during wartime, or during humanitarian assistance operations.<br><br>For underwater detonations on SSTC oceanside under Alternative 1 and 2:<br>• The buffer for very shallow water detonations (0 to 24 feet of water) and for shallow water detonations (in 24 to 72 feet of water) will be the same as described for the No Action Alternative.<br><br>For SWAG charges laid bayside on SSTC under Alternative 1 and 2:<br>• A buffer zone of 180 feet will be established around each SWAG detonation point. |

**Table 3.10-4: Summary of Effects (Continued)**

| Alternative | Effects |
|---|---|
| **Mitigation (Continued)** | • Observer(s) with binoculars and small craft will survey the detonation area and the buffer zone for sea turtles from at least 10 minutes prior to commencement of the scheduled explosive event until at least 10 minutes after detonation. Observers will pay extra attention within the buffer zone to large amounts of floating kelp strands and other marine debris (if any), since these may provide shelter and food for sea turtles.<br>• Divers placing charges on mines and dive support vessels will check the area immediately around the mine location for sea turtles.<br>• If a sea turtle is sighted within the buffer zone or moving towards it, exercises will be suspended until the animal has voluntarily left the area and the area is clear of sea turtles for at least 10 minutes.<br>• Immediately following the detonation, visual monitoring for sea turtles within the buffer zone will continue for 10 minutes. Any animals appearing will be observed for signs of injury. Injured sea turtles will be reported to the CNRSW Environmental Director, the PACFLT Environmental Office, and NMFS regional stranding coordinator.<br><br>As a result of the informal green sea turtle consultation with NMFS, the Navy will implement an additional mitigation measure:<br><br>• If there are sea turtles known to be equipped with sonic tags in the area of and during pile driving operations, Navy will collaborate with NMFS to analyze movements of these turtles in the immediate area during pile driving. Following any monitoring of sound attenuation associated with pile driving, the Navy will share the results with NMFS and provide recalculations of buffer zones as they are available. |

# 3.11 Terrestrial Biological Resources

# 3.11 TERRESTRIAL BIOLOGICAL RESOURCES

## 3.11.1 Affected Environment

### 3.11.1.1 Introduction

The terrestrial biological resources in the Silver Strand Training Complex (SSTC) are described here for the purpose of comparing the environmental consequences of the alternatives. Terrestrial communities are discussed, as well as the non-avian wildlife and plants that are found within them. Birds are discussed later in Section 3.12. Federally listed and other special status species are discussed individually. Current management and mitigation practices for terrestrial biological resources in the Region of Influence (ROI) are described in Section 3.11.1.6.

#### 3.11.1.1.1 Regulatory Framework

The primary drivers of past management and mitigation practices for terrestrial biological resources have been the Clean Water Act (CWA) and the Endangered Species Act (ESA). Section 404 of the CWA as it pertains to U.S. jurisdictional waters (which include freshwater wetlands, some vernal pools, salt marsh, and portions of the beach) requires mitigation for projects that cause discharge of dredge or fill, and such projects must be permitted by the U.S. Army Corps of Engineers (USACE). The U.S. Environmental Protection Agency (USEPA) Guidelines under the CWA for jurisdictional waters, in addition to the broader guidelines, apply a burden of proof requirement to demonstrate that no practicable alternatives exist that will meet a project's purpose. Examples of Executive Orders that drive management practice include Executive Order 13112 "Invasive Species", and Executive Order 11990 "Protection of Wetlands." Following national policy established by the White House beginning in 1989 for implementing Section 404 of the CWA—and adopted through memoranda by the USEPA and USACE—the Navy's policy (Operational Navy Instruction [OPNAVINST] 5090.1C) is that there shall be "no net loss" of the acreage and ecological function of wetland habitat. Jurisdictional waters of the U.S. and wetlands require permits for activities that disturb the ground, and for possible mitigation.

The ESA also pertains to terrestrial biological resources. The provisions of the ESA are that, once a species becomes listed as endangered or threatened, regulations to protect the species from illegal "take" become applicable to any project that may affect an individually listed animal or its habitat. The U.S. Fish and Wildlife Service (USFWS) oversee the ESA implementation for all federally listed species. Since the San Diego fairy shrimp *(Branchinecta sandiegonensis)* presently occupies portions of SSTC-South (SSTC-S), the USFWS becomes involved in all projects potentially affecting this species. Under Section 7 of the ESA, federal project proponents must consult with USFWS if one or more listed species may be affected by an action. Consultation with USFWS may range from informal discussions to formal consultation requiring a biological assessment by the project proponent and the issuance of a Biological Opinion by the USFWS. "Terms and conditions" are stated in the Biological Opinion, which are measures to avoid or minimize the take of any listed species. When an "incidental take statement" is issued with the Biological Opinion, the federal project proponent may be excused from accidentally taking a listed species as part of the agency's otherwise lawful activity as long as the specified taking conditions are met. The Navy developed a Biological Assessment that evaluated the effects of SSTC training on federally listed species and completed formal Section 7 consultation with the USFWS on these effects under the ESA. With the implementation of mitigation measures presented in this section, the USFWS signed a Biological Opinion on July 7, 2010 concluding that the Proposed Action would not jeopardize the continued existence of the San Diego fairy shrimp.

#### 3.11.1.1.2 Definition

For the purposes of this Environmental Impact Statement (EIS), terrestrial biological resources are defined as the plants, non-avian wildlife, and the land, soil, and water resources utilized by these plants and animals that occupy the beaches and upland portions of the SSTC. This area is between the linear strip of organic debris left by the high tide called the wrack line on the oceanside beaches of SSTC-North (SSTC-N), SSTC-S, and portions of Naval Air Station North Island (NASNI), and all uplands and developed areas between the wrack line and the bayside water line. NASNI is included where military activities are proposed or where natural resources are managed jointly with those in the project footprint from Breakers Beach to Zuniga Jetty. Submerged vegetation and marine jurisdictional wetlands and waters are discussed in Section 3.7, Marine Biological Resources.

#### 3.11.1.1.3 Regional Setting

The San Diego region has a semi-arid Mediterranean climate, characterized by winter and spring precipitation, summer fog, and summer drought. Evaporation exceeds rainfall throughout most of the year, and this moisture deficit is fundamental to defining the type of terrestrial vegetation and wildlife that characterize and inhabit the landscape. The species biodiversity of this region reflects both this climate and the area's inherent landscape diversity. From the Pacific Ocean moving east, the coastal plain rises to gently sloping inland mesas dissected by stream systems, then to mountains rising up to 6,000 feet in elevation which then drop dramatically to desert elevations below sea level. Inland topography and weather extremes contrast with the more equable climate of the coast where the action area for this EIS is located.

Represented on the various land parcels of the San Diego region are several of southern California's natural communities that have declined in area due to losses related to the urbanization of southern California: Diegan coastal sage scrub, southern maritime chaparral, and dunes. These communities are considered sensitive by conservation organizations and are, in some cases, protected through federal, state, or local laws and regulations. The training at SSTC that constitutes the alternatives is conducted in an urban context. Open spaces and natural habitats abut hardscaped roads, buildings, highways, and residences. They interface onto lands and waters that also support urban commerce, industry, tourism, recreation, a National Wildlife Refuge (NWR), and residential communities.

#### 3.11.1.1.4 Region of Influence

The ROI includes all of SSTC-N, SSTC-S, and Breakers Beach to Zuniga Jetty on NASNI. While not harboring terrestrial biological resources, the ROI also includes the oceanside and bayside training lanes as well the ocean anchorages located offshore of SSTC-N, for consistency with the other resource sections in this EIS.

### 3.11.1.2 Terrestrial Communities and Cover Types

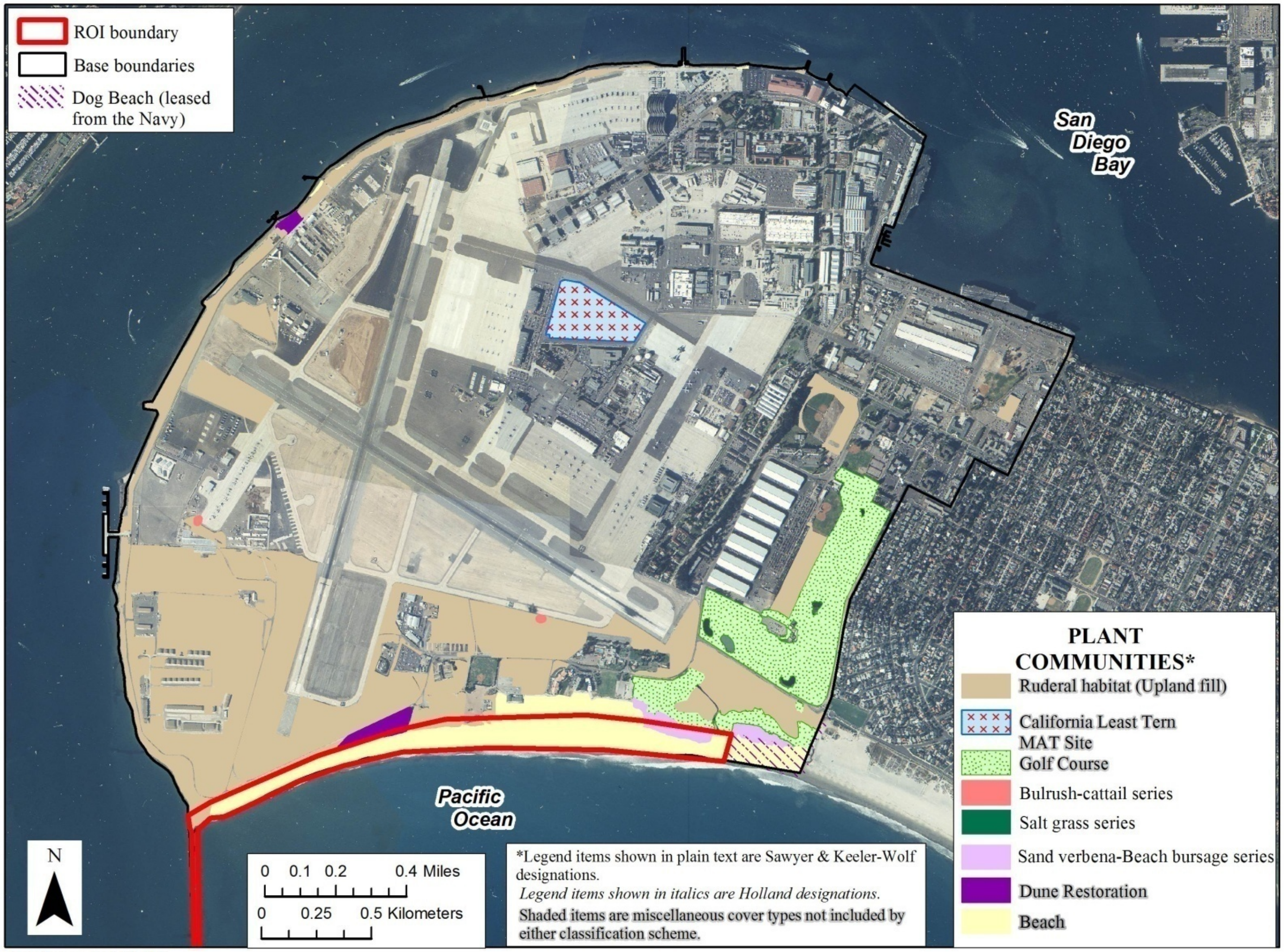
This section describes the plant communities of the project area, in order from those highest in elevation (coastal sage scrub) to those lowest (beaches). Marine tidal and subtidal communities are described in Section 3.7, Marine Biological Resources. The ROI is considered to be in the south coast subdivision of the California Floristic Province, and the species naming and floristic conventions used here are consistent with Hickman (1996). Native plant communities were mapped using the Sawyer and Keeler-Wolf vegetation classification system (Sawyer and Keeler-Wolf 1995, Keeler-Wolf and Evens 2005) for recent mapping work at NASNI and SSTC-S. Older mapping units (e.g., Naval Amphibious Base [NAB] Coronado) are labeled and described in a manner consistent with the Holland vegetation classification system (Holland 1986), as modified by Oberbauer (1996). Natural resources surveys were conducted on NASNI and SSTC-S from October 2004 through October 2005 by RECON Environmental Consultants (RECON 2004, 2005). Vegetation surveys were conducted on NAB Coronado in December 1981, January 1982 (Department of the Navy [DoN] 1982), and April 1996 (DoN 1998).

The principal plant species list for SSTC-S was first developed based on a 1981-1982 survey by Brand et al. (1982). Field surveys were later completed in the spring of 1987 to verify this list and to locate any species not noted earlier (Wagoner and Grizzle 1989), then again by RECON in 1996 (DoN-Southwest Division 1998b). Vegetation of the SSTC-S inland area and NASNI was most recently mapped in 2001 and 2004 (RECON 2004, 2006). Plant surveys were conducted on NAB Coronado on SSTC-S in December 1981 and January 1982 (DoN-Western Division 1982). In April 1996, vegetation units were mapped based on field walks and aerial photography (DoN 1998). Table 3.11-1 gives the acreage of terrestrial plant community and land cover types within the project area. The distribution of these communities is shown in Figures 3.11-1 through 3.11-3. Following these are brief descriptions of the mapping units listed.

**Table 3.11-1: Terrestrial Plant Communities and Cover Types within the ROI based on the Most Current Vegetation Map for Each Area, and including the Delta Beaches**

| Plant Community | NASNI | | SSTC-N * | | SSTC-S | | TOTALS | |
|---|---|---|---|---|---|---|---|---|
| | *Acres* | *Ha* | *Acres* | *Ha* | *Acres* | *Ha* | *Acres* | *Ha* |
| ***Developed, Fill, or Other***[O] | *5.6* | *2.3* | *404.8* | *163.9* | *283.3* | *114.7* | *693.7* | *280.9* |
| Ruderal habitat including fill[O] | 5.0 | 2.0 | 34.8 | 14.1 | 42.7 | 17.3 | 82.5 | 33.4 |
| Iceplant[S] | 0 | 0 | 0 | 0 | 165.1 | 66.8 | 165.1 | 66.8 |
| Urban/developed lands[O] | 0.4 | 0.2 | 370.0 | 149.8 | 75.5 | 30.6 | 445.9 | 180.6 |
| Riprap[O] | 0.2 | 0.1 | 0 | 0 | 0 | 0 | 0.2 | 0.1 |
| ***California Annual Grassland***[S] | *0* | *0* | ***0*** | ***0*** | ***125.5*** | ***50.8*** | ***125.5*** | ***50.8*** |
| ***Diegan Coastal Sage Scrub***[H] | *0* | *0* | *0* | *0* | ***15.1*** | ***6.1*** | ***15.1*** | ***6.1*** |
| California buckwheat series[S] | 0 | 0 | 0 | 0 | 2.7 | 1.1 | 2.7 | 1.1 |
| California sagebrush series[S] | 0 | 0 | 0 | 0 | 7.7 | 3.1 | 7.7 | 3.1 |
| Coyote brush series[S] | 0 | 0 | 0 | 0 | 4.7 | 1.9 | 4.7 | 1.9 |
| ***Maritime Succulent Scrub***[H] | *0* | *0* | *0* | *0* | ***7.3*** | ***3.0*** | ***7.3*** | ***3.0*** |
| ***Vernal Pools***[O] | *0* | *0* | *0* | *0* | ***3.2*** | ***1.3*** | ***3.2*** | ***1.3*** |
| San Diego Mesa vernal pools[H] | 0 | 0 | 0 | 0 | 3.2 | 1.3 | 3.2 | 1.3 |
| ***Upland Transition*** | ***0*** | ***0*** | ***90.0*** | ***36.4*** | ***0*** | ***0*** | ***90.0*** | ***36.4*** |
| ***Southern Foredune/Beach***[O] | ***63.8*** | ***25.8*** | ***277.5*** | ***112.3*** | ***77.9*** | ***31.5*** | ***419.2*** | ***169.6*** |
| Beach[O] | 59.7 | 24.2 | 232.5 | 94.1 | 43.5 | 17.6 | 335.7 | 135.9 |
| Sand verbena-Beach bursage series[S] | 3.8 | 1.5 | 0 | 0 | 34.4 | 13.9 | 38.2 | 15.4 |
| Disturbed coastal dune[O] | 0 | 0 | 45.0 | 18.2 | 0 | 0 | 45.0 | 18.2 |
| Dune restoration area[O] | 0.3 | 0.1 | 0 | 0 | 0 | 0 | 0.3 | 0.1 |
| ***Freshwater Marsh***[H] | ***0*** | ***0*** | ***0*** | ***0*** | ***3.3*** | ***1.3*** | ***3.3*** | ***1.3*** |
| Bulrush-Cattail series[S] | 0 | 0 | 0 | 0 | 0.9 | 0.3 | 0.9 | 0.3 |
| Spikerush series[S] | 0 | 0 | 0 | 0 | 2.4 | 1.0 | 2.4 | 1.0 |
| ***Coastal Salt Marsh***[H] | *0.2* | *0.1* | *13.8* | *5.6* | *56.7* | *22.9* | *70.7* | *28.6* |
| Pickleweed series[S] | 0 | 0 | 0 | 0 | 55.4 | 22.4 | 55.4 | 22.4 |
| Salt grass series[S] | 0.03 | 0.01 | 0 | 0 | 0 | 0 | 0.03 | 0.01 |
| Pickleweed-saltgrass series[S] | 0 | 0 | 0 | 0 | 1.3 | 0.5 | 1.3 | 0.5 |
| ***Water***[O] | ***0.7*** | ***0.3*** | ***20.8*** | ***8.4*** | ***9.0*** | ***3.6*** | ***30.5*** | ***12.3*** |
| Unvegetated channel[O] | 0.2 | 0.1 | 0 | 0 | | | 0.2 | 0.1 |
| Freshwater pond[O] | 0 | 0 | 0 | 0 | 0.8 | 0.3 | 0.8 | 0.3 |
| Open water | 0.5 | 0.2 | 20.8 | 8.4 | 8.2 | 3.3 | 29.5 | 11.9 |
| ***Totals*** | *70.3* | *28.5* | *806.9* | *326.6* | *581.3* | *235.2* | *1458.5* | *590.3* |

Vegetation Classification Systems: [H] Holland, [S] Sawyer and Keeler-Wolf, [O] Other types not classified by either system. These are mostly bay fill land cover types or developed areas. * Acreages for Delta Beaches North and South are included
Sources: RECON 2004, 2005 and DoN 1982, 1998




*Data Source: RECON 2005*

**Figure 3.11-1: Plant Communities of NASNI Based on Most Recent Vegetation Map**

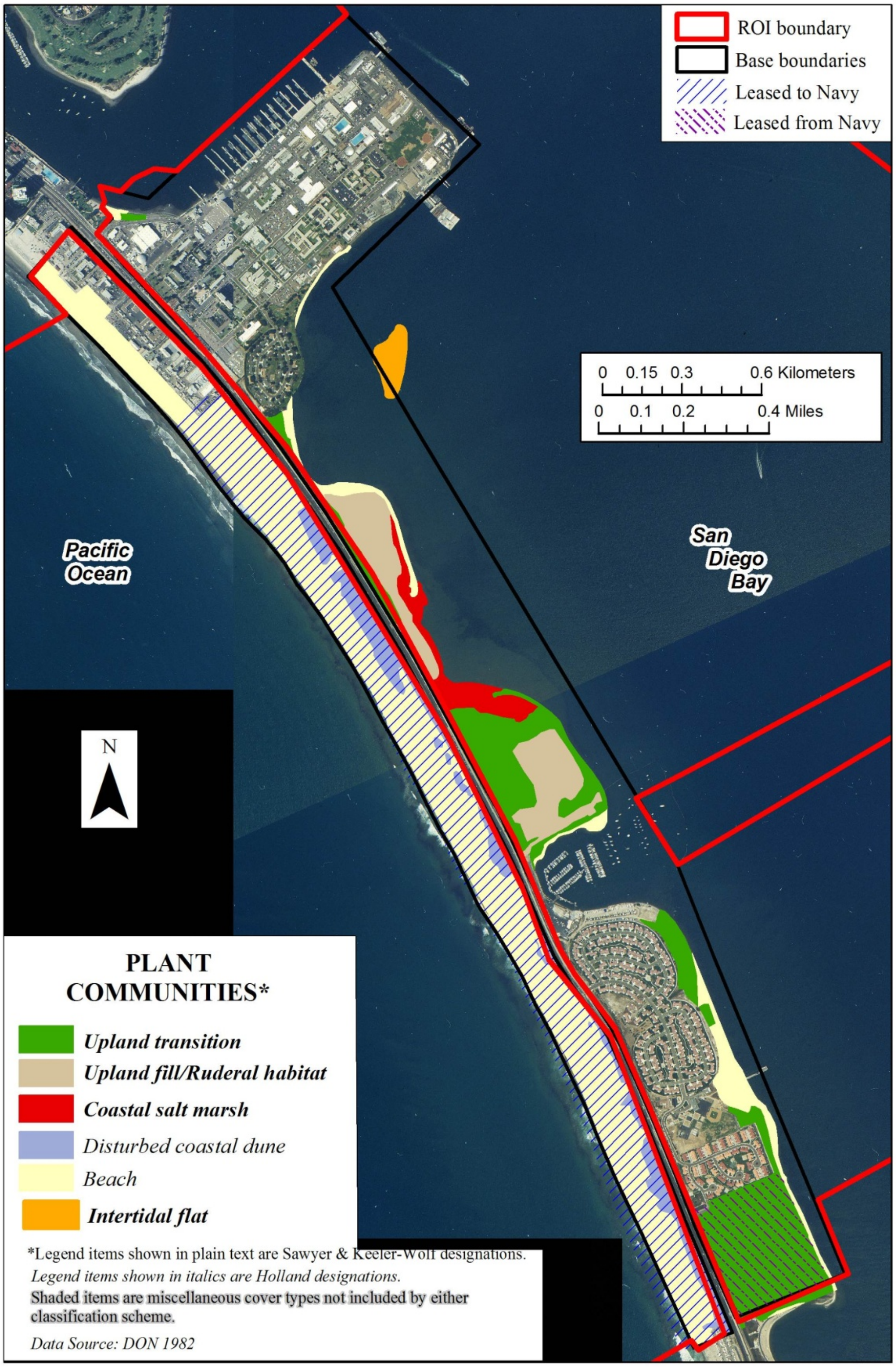



**Figure 3.11-2: Plant Communities of SSTC-N (NAB Coronado) Based on Most Recent Mapping**

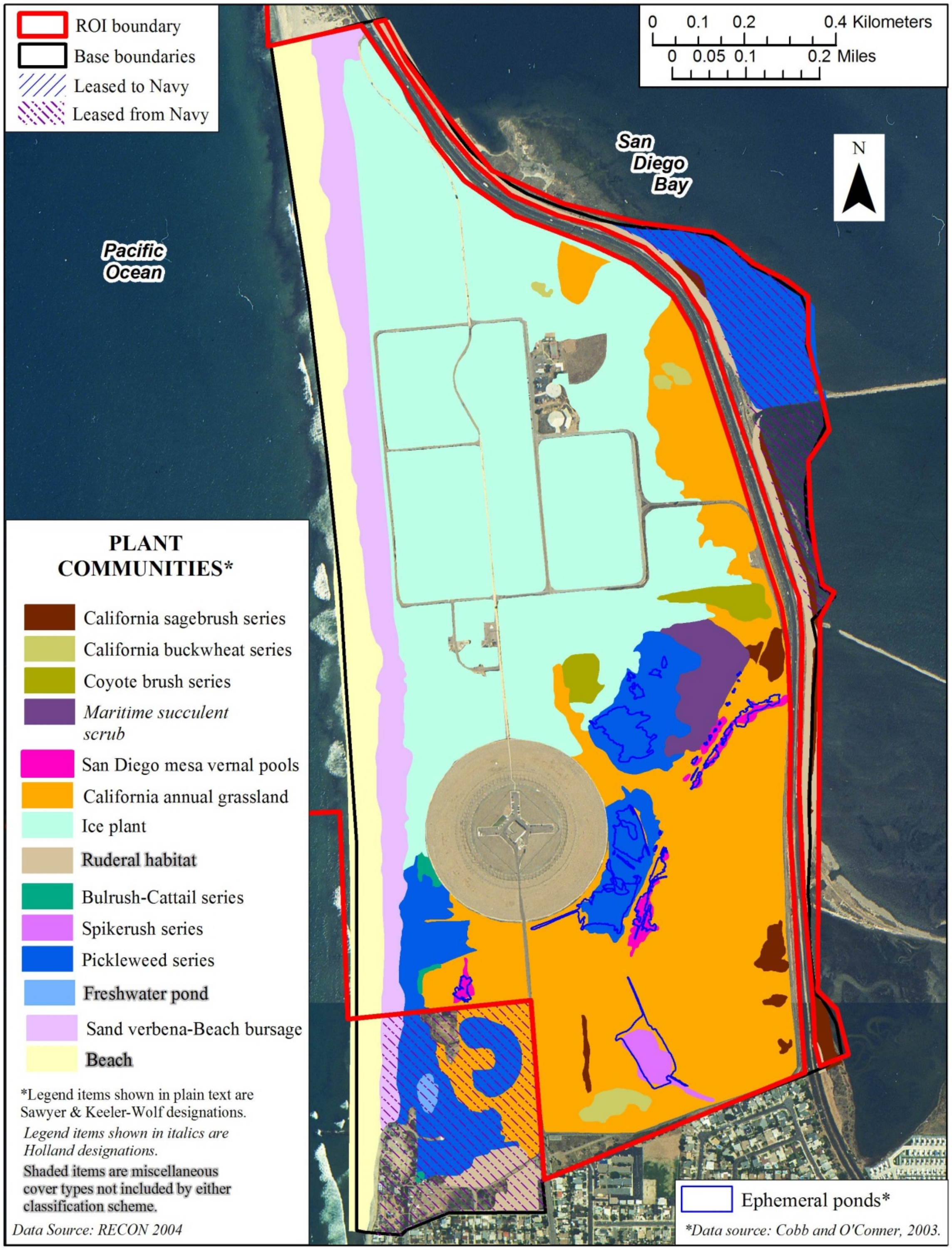



**Figure 3.11-3: Plant Communities of SSTC-S (NRRF) Based on Most Recent Vegetation Map**

#### 3.11.1.2.1 Developed, Ruderal, Fill, and Other Uplands

Developed areas such as NAB Coronado and NASNI complexes do not usually support native vegetation and contain man-made structures such as buildings or paved roads. Ruderal areas, where the natural vegetation has been disturbed by man, are dominated by non-native weeds. Non-native annual grasses occur in low abundance. However, Nuttall's lotus (*Lotus nutallianus*) does grow within some developed areas, such as in cracks in the pavement in the inland area of SSTC-S. Areas of fill that remain undeveloped, such as Delta Beach North and Delta Beach South, while weedy similar to areas classified as ruderal, frequently contain special status species that are naturally adapted to disturbed areas, such as Nuttall's lotus and coast woolly-heads (*Nemacaulis denudata* var. *denudata*).

Landscaped areas support some native wildlife. Many ornamental trees in landscaped areas are used for nesting by herons or raptors near the action area. Iceplant (*Carpobrotus edulis*, among other species) has historically been used as erosion and fire control and was often planted on the sides of freeways. A large portion of SSTC-S was planted with iceplant in the 1950s to control erosion. Since that time, it has spread over the building foundations at inland SSTC-S (streets and concrete foundations of a planned community abandoned in the 1880s), and now covers approximately 164 acres as a monoculture, displacing native habitat. It is also found on SSTC-N in sporadic locations on the dunes west of State Route 75 (SR-75). No special status species have been associated with this cover type in the project area. Artificial structures of the shoreline, such as the riprap at Zuniga Jetty and Coronado, also provide a certain amount of habitat for wildlife, especially for birds (discussed in Section 3.12), but also pests such as rats and opossums.

#### 3.11.1.2.2 California Annual Grassland

Grasslands are often dominated by several species of non-native grasses; however, at inland SSTC-S and NASNI native saltgrass is a common, sometimes dominant grassland element. Other dominant grass species in the annual grassland at inland SSTC-S include foxtail chess (*Bromus madritensis* ssp. *rubens*), soft chess (*B. hordeaceus*), ripgut (*B. diandrus*), and wild oat (*Avena fatua*). Common forbs include iceplant, Australian saltbush (*Atriplex semibaccata*), white-stemmed filaree *(Erodium cicutarium)*, and the native coast locoweed (*Astragalus trichopodus* ssp. *lonchus*). Areas of increased soil salinity support alkali weed, increased saltgrass, and pickleweed.

These grasslands can be used by many wildlife species, especially birds, for nesting and foraging purposes. Breeding birds using this habitat include the horned lark (*Eremophila alpestris*), western meadowlark (*Sturnella neglecta*), and the grasshopper sparrow (*Ammodramus savannarum*).

#### 3.11.1.2.3 Diegan Coastal Sage Scrub

Diegan coastal sage scrub is a type of upland community with several phases based on dominant species. This vegetation community is comprised of low, soft-woody subshrubs to about three feet high, is found mainly on south facing slopes below 1,500 feet in elevation, and is one of the major shrub-dominated (scrub) communities within California. This community occurs on xeric (dry) sites with shallow soils, such as steep, south-facing slopes or clay-rich soils that are slow to release stored water. Sage scrub species are drought-resistant deciduous plants with shallow root systems. Both of these adaptations allow for the occurrence of sage scrub species on these xeric sites. Within the project area, three coastal sage scrub phases have been mapped based on dominant species: California sagebrush (*Artemisia californica*), California buckwheat (*Eriogonum fasciculatum*), and coyote brush *(Baccharis pilularis).*

Diegan coastal sage scrub was listed as the third most extensive vegetation community in San Diego County over 35 years ago (California Department of Fish and Game [CDFG] 1965); however, the reduction of this once common habitat is evident in the number of declining plant species as well as animal species dependent upon it, including the federally threatened coastal California gnatcatcher (*Polioptila californica californica*) and many additional sensitive wildlife and plant species.

The reduction of this common habitat also changes the vegetation types that it can support. Of the vegetation types that are potentially supported by undisturbed Diegan coastal sage scrub, only a subset of these are supported by disturbed Diegan coastal sage, which also supports exotic species. It is heavily invaded by iceplant and also contains pineapple weed (*Amblyopappus pusillus*), tread-lightly (*Cardionema ramosissima*), and Bishop's lotus (*Lotus strigosus*). Coyote brush series is also found on disturbed Diegan coastal sage scrub areas in inland SSTC-S.

#### 3.11.1.2.4 Maritime Succulent Scrub

Maritime succulent scrub reaches its northern distribution limits in San Diego County on the mainland and offshore on the California Channel Islands. It is confined to thin, rocky or sandy soils on dry, south-facing slopes along the coastal areas, from Torrey Pines State Park south to El Rosario in northern Baja California. Maritime succulent scrub is a low, open vegetation type with a poorly developed understory (Holland 1986). This community occurs on SSTC-S in close association with coastal sage scrub.

The dominant shrub species overlap somewhat with those of the coastal sage scrub and salt marsh, but with the addition of cacti and other succulents. Characteristic species include California boxthorn (*Lycium californicum*), variegated dudleya (*Dudleya variegata*), San Diego barrel cactus (*Ferocactus viridescens*), and cholla (*Opuntia prolifera*). Pickleweed (*Salicornia subterminalis*) is a common associate due to the proximity of nearby salt marsh.

#### 3.11.1.2.5 San Diego Mesa Vernal Pools and Other Ephemeral Ponds

San Diego mesa vernal pools are a type of landform characterized by a low, amphibious, herbaceous plant community dominated by annual herbs and grasses located in small depressions in flat-topped marine terraces (Holland 1986). A hardpan prevents the downward drainage of water; plants germinate and grow when the depressions fill during winter rains. As water evaporates in the spring, colorful bands of vegetation appear, and tiny shrimp and other animals inhabiting the pools hatch and complete their life cycles. Vernal pools as a habitat have been severely depleted in acreage in San Diego County and elsewhere in California except on military lands, since they occur on flat mesas that are suitable for building homes and other development. For this reason, some of the plants and invertebrates that specialize in vernal pools have become rare.

Vernal pools at inland SSTC-S do not support a plant community typical of well-developed pools elsewhere in San Diego County, but they contain recognized indicator plants such as dwarf woolly-heads (*Psilocarphus tenellus* ssp. *tenellus*) and water star-wort (*Callitriche marginata*). Also present are grass poly (*Lythrum hyssopifolia*), alkali weed (*Cressa truxillensis*), and alkali-mallow (*Malvella leprosa*), along with other nonnative species. Multiple small pools border the maritime succulent scrub community, and several larger pools occur along internal drainages. Note that this mapping unit is a vegetation classification only, and not a jurisdictional determination under Section 404 of the CWA, nor a delineation of potential habitat for the federally endangered San Diego fairy shrimp (*Branchinecta sandiegonensis*), which can occur in ephemeral pools or even road ruts that contain no vernal pool indicator plants. Fairy shrimp will be discussed in Section 3.11.1.4.2.

#### 3.11.1.2.6 Upland Transition

Upland Transition is often in the transition between coastal salt marsh and the scrub communities, and often includes plant species that are tolerant to desiccation or salt stress. At other locations where this species may be found, this zone is on the upper coastal strand, a transition between the sandy beach and various plant communities, landscaping, or shoreline structures. On SSTC-N, the occurrence of Brand's phacelia (*Phacelia stellaris*) is in an area that could be classified as coastal strand.

#### 3.11.1.2.7 Southern Foredunes

Southern foredunes arise along the coast where sandy beaches occur and where coastal headlands are absent. Dune size and shape vary and are dependent on wind speed and direction. For southern foredunes, wind speed is low enough to allow for plant development, which is dense to scattered because of the dry, warm summer days, and well-drained dune soils. Foredune plant species that occur along the shore are well adapted to open, sandy, often windy conditions. Plants found here are prostrate and have long taproots, with many succulents. Some foredune plant species are more tolerant of salty conditions; therefore, these species are more apt to be found closer to the seashore. Sand verbena-beach series, analogous to the southern foredune community of Holland (1986), occurs on sandy sites adjacent to the high surf line from NASNI to SSTC-S. Along the dunes on the beach side of SSTC-S, a degraded form of this community includes dominants of red sand verbena (*Abronia maritima*), beach sand verbena (*A. umbellata*), beach-bur (*Ambrosia chamissonis*), and beach evening primrose (*Camissonia cheiranthifolia* ssp. *cheiranthifolia*). Other species present include sea rocket (*Cakile maritima*), California suncup (*Camissonia bistorta*), beach morning glory (*Calystegia soldanella*), and false-mustard (*Camissonia californica*). A Navy dune restoration site comprises a portion of the mapped dune community, consisting of a single row of low foredunes, covering 1.2 acres along the central portion of the NASNI ocean front.

#### 3.11.1.2.8 Sandy Beaches

The ecology of sandy beaches in California has been found to hinge on the line of organic and other debris left by the high tide, called the wrack line (Dugan et al. 2003, Hubbard and Dugan 2003, Dugan et al. 2000). The kelp, seagrasses, and other debris thrown ashore are rich in invertebrates that consume the kelp at night. These function as a forage base for many wintering shorebirds, including the western snowy plover (*Charadrius alexandrinus nivosus*). The birds feed on invertebrates and the kelp itself. Also, the wrack debris allows fine sand to be captured rather than be washed or blown away, allowing the development of beach hummocks, and eventually dunes. Mammals and birds from inland are also attracted to the wrack line, including the large-billed savannah sparrow (*Passerculus sandwichensis rostratus*), Belding’s savannah sparrow (*Passerculus sandwichensis beldingi*), and flycatchers. When beach wrack is left intact after slight disturbance, animal recolonization can occur within hours (Dugan et al. 2003).

Birds that nest in this habitat include the western snowy plover, California least tern (*Sterna antillarum browni*), and horned lark. Killdeer (*Charadrius vociferus*), black-bellied plover (*Pluvialis squatarola*), least sandpiper (*Calidris minutilla*), American pipit (*Anthus rubescens*), house finch (*Carpodacus mexicanus*), other shorebirds, gulls, and terns loaf and forage here (Unitt 2004). Dunes and the adjacent beaches support specialized invertebrate fauna, such as tiger beetles and the globose dune beetle (*Coelus globosus*), sand spiders, robber flies, kelp flies, and ants.

#### 3.11.1.2.9 Freshwater Marsh

Freshwater marshes are nontidal and are contiguous with the upland boundaries of salt marsh habitats. In shallow standing water or on perennially saturated ground, the dominant plants of this community are southern cattails (*Typha domingensis*), mulefat (*Baccharis salicifolia*), prairie bulrush (*Scirpus robustus*), and spikerush (*Eleocharis* spp.). The spikerush series of freshwater marsh at SSTC-S is characterized by perennial, emergent monocots in permanently flooded areas. Pale spikerush (*Eleocharis macrostachya*) and curly dock (*Rumex crispus*) dominate the area. Common birds of the freshwater marsh include the least bittern, ruddy duck, cinnamon teal (*Anas cyanoptera*), Virginia rail (*Rallus limicola limicola*), moorhen (*Gallinula chloropus*), American coot (*Fulica americana*), black phoebe (*Sayornis nigricans*), marsh wren (*Cistothorus platensis*), common yellowthroat (*Geothlypis trichas*), song sparrow (*Melospiza melodia*), and red-winged (*Agelaius phoeniceus*) and tri-colored blackbirds (*A. tricolor*) (Unitt 2004).

#### 3.11.1.2.10 Coastal Salt Marsh

The tidal cycle is a key controlling characteristic of the salt marsh. The salinity of the tide defines the plants and animals that can survive in the marsh area. The vertical range of the tide determines flooding depths and the height of the vegetation, and the tidal cycle controls how often and how long vegetation is submerged. Two areas are delineated by the tide: the low marsh and the high marsh. The low marsh floods and drains twice daily with the rise and fall of the tide; the high marsh, which is at a slightly higher elevation, floods less frequently. They are formed where salinity is high, ranging from 20 to 30 parts per thousand. In the upper estuary, where river input dominates, the water has only a trace of salt. This varying salinity produces changes in the marsh—in the kinds of species and also in their number.

### 3.11.1.3 Terrestrial Wildlife

The wildlife discussion presented here was compiled from various surveys as summarized in the Integrated Natural Resources Management Plan (INRMP) for Naval Base Coronado (NBC) (DoN 2002). Natural resources surveys were conducted on NASNI and SSTC-S from October 2004 through October 2005 by RECON Environmental Consultants (2004 for SSTC-S, 2006 for NASNI). For the NAB portion of SSTC-N, the most recent baseline wildlife surveys were conducted in 1996 by RECON in support of the Navy's INRMP (U.S. Navy 1998). This included small mammal trapping on the 40-acre parcel leased to the California Department of Parks and Recreation (CDPR) (Cameron and Arnold 1996 as cited in U.S. Navy 1998). At SSTC-S, RECON had also conducted surveys in 1995-1996 for the INRMP at that time; the more recent surveys built on those efforts. These earlier surveys involved pit-fall trapping, aerial netting, and directed searches for special status invertebrates (tiger beetles, and sifting sand samples for globose dune beetles).

In the following descriptions, the classification system used for wildlife species may not be consistent with the sources identified, due to the need for consistency with resource agency nomenclature.

#### 3.11.1.3.1 Invertebrates

Surveys on some terrestrial portions of the project area in 2004 and 2005 (RECON 2005, 2006) detected common invertebrates such as various kelp flies (Families Coelopidae and Anthomyidae), dune silverfish (Family Lepismatidae), leaf beetles (Family Chrysomelidae), and snout beetles (Family Curculionidae). The spider fauna of the dunes was found to be diverse and includes at least one endemic species (RECON 2006). Funnel web weavers (Family Agelenidae), wolf spiders (Family Lycosidae), trapdoor spiders (Family Ctenizidae), and the endemic sand spiders of the genus *Lutica* (Family Zodariidae) were found. The nocturnal sand spiders are restricted to southern California coastal dunes and are adapted for burrowing in fine sand. Tarantula hawks (*Pepsis* sp.) can be seen flying around the dunes hunting for spiders. A few special status species have been recorded including the globose dune beetle, sandy beach tiger beetle (*Cicindella hirticollis gravida*), mudflat tiger beetle (*C. trifasciata sigmoidea*), a third tiger beetle (*C. latesignata* spp. *latesignata*), and wandering skipper (*Panoquina errans*), as well as the federally endangered San Diego fairy shrimp. Invertebrates are the primary prey item for many types of wildlife and are important as pollinators for many plant species.

#### 3.11.1.3.2 Reptiles and Amphibians

The classification system for amphibian and reptiles is from the San Diego Natural History Museum Field Guide based on Crother (2000).

Terrestrial reptiles and amphibians have shown well documented declines in recent decades. Some lizards such as the western fence lizard (*Sceloporus occidentalis*), alligator lizard (*Elgaria multicarinata webbi*), and side-blotched lizard (*Uta stansburiana*) are frequently observed around buildings. Snakes are less common and includes the San Diego gopher snake (*Pituophis melanoleucuspumilis*), which has been observed at SSTC-S (DoN 1998, RECON 2006). The California Species of Concern silvery legless lizard (*Anniella pulchra pulchra*) has been reported on both SSTC-N and SSTC-S (Wagoner and Grizzle 1989), but was not recorded in recent surveys.

#### 3.11.1.3.3 Mammals

The classification system for mammals is based on the Smithsonian Institution's *Mammal Species of the World* (Wilson and Reeder [eds.] 1993).

Mammals are found year-round on all properties of the SSTC. The native habitats as well as developed areas harbor populations of small mammals that are an important food source for raptors and other large carnivores. The only sensitive mammal confirmed in the area is the San Diego black-tailed jackrabbit (*Lepus californicus bennettii*), which is a federal species of concern and a CDFG species of special concern. It is common at SSTC beaches, grasslands, open scrub, and ruderal areas. Mammal burrows are used by the western burrowing owl (*Athene cunicularia hypugea*), and these burrow complexes are considered sensitive. California ground squirrels (*Spermophilus beecheyi*) are common. Feral cats (*Felis cattus*), are controlled because they represent a threat to federally listed nesting birds. The gray fox (*Urocyon cinereoargenteus*), Virginia opossum (*Didelphis virginiana*) and striped skunk (*Mephitis mephitis*) also occur (Stewart 2004).

Consistent with Biological Opinions at NASNI and throughout the SSTC, certain mammals are managed by the Navy and the U.S. Department of Agriculture Animal and Plant Health Inspection Service as predators of the federally listed least tern and western snowy plover. These include opossum, striped skunk, and other mammals that consume eggs or young. Ground squirrels are managed to benefit burrowing owls, since burrowing owls use burrows created by ground squirrels. Ground squirrel control is done in areas where the ground squirrels pose a threat to federally listed species and/or contribute to increase the bird-aircraft strike hazard (BASH) risk (by providing additional burrowing owl burrows) or negatively affect other essential operations. To sustain ground squirrel populations, no rodent control is conducted unless mandated by an outbreak of disease or the rodents are negatively impacting a listed species. Squirrel burrows are never filled, buried, or gassed without consulting the NBC Wildlife Biologist.

### 3.11.1.4 Federally Listed Species

The Navy developed a Biological Assessment that evaluated the effects of SSTC training on federally listed species and completed formal Section 7 consultation with the USFWS on these effects under the ESA. The USFWS consultation process was completed with the signing of the Biological Opinion July 7, 2010.

#### 3.11.1.4.1 Federally Endangered Plants

Salt marsh bird's beak (*Cordylanthus maritimus* ssp. *maritimus*) is a federally endangered plant that occurs at YMCA Camp Surf outside the area that will be subject to impacts associated with the Proposed Action. Since this species will not be impacted, it will not be addressed further in this document except with regard to general management measures that incidentally pertain to it. Coastal dune milk vetch (*Astragalus tener* var. *titi*) is a federal and state endangered annual of the family Fabaceae that was historically found on the beaches of SSTC-N, but is believed to be extirpated. It will not be discussed further in this document. There are no other threatened or endangered plants in the study area.

#### 3.11.1.4.2 San Diego Fairy Shrimp

The San Diego fairy shrimp is listed as federally endangered (62 FR 4925, 3 February 1997). USFWS protocol fairy shrimp surveys were conducted at SSTC-S from January to May of 2001 and between

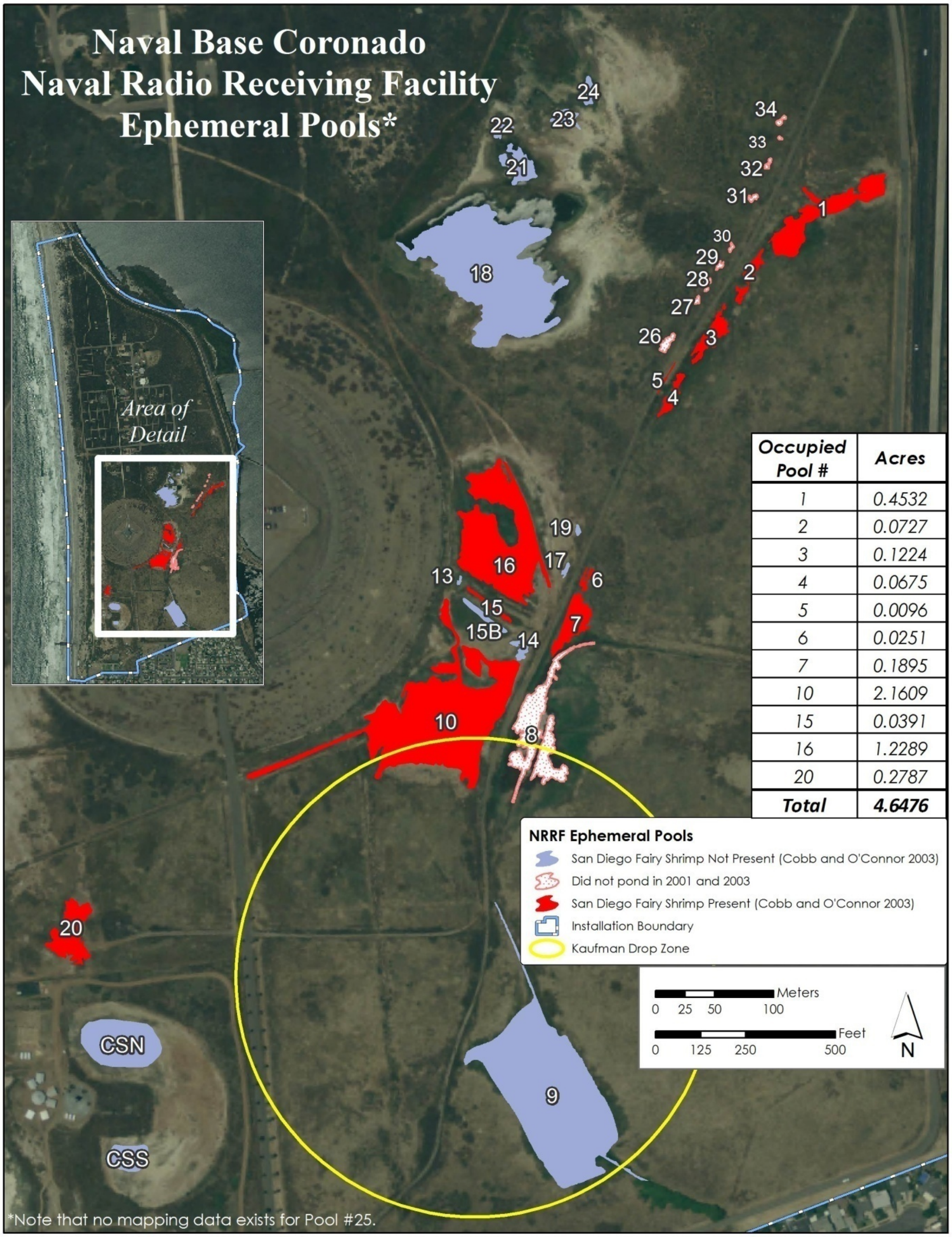
February and May of 2003. San Diego fairy shrimp were found in 11 of 25 vernal pools and salt marshes surveyed (Cobb and O'Connor 2003). The San Francisco brine shrimp (*Artemia fransiscana*), not a listed species, was present in 4 of the 25 ephemeral pools surveyed. One pool contained on the order of hundreds of San Diego fairy shrimp when observed, while the remaining 10 pools contained on the order of tens of the federally endangered fairy shrimp. Figure 3.11-4 identifies the pools determined to be occupied in 2001 and 2003. While the Kaufman drop zone presented in Figure 3.11-4 has been previously established, the northern portions are not used for training activities.

The San Diego fairy shrimp is found in vernal pools and other seasonally filled soil depressions in coastal southern California, from Santa Barbara County to northern Baja California, Mexico. Vernal pools form depressions that occur in an impervious soil layer, such as a claypan. The impervious layer can also form as a result of soil compaction that impedes the drainage of water following winter rains, such as in road ditches and ruts. As water evaporates from these pools during early spring and summer, various endemic, short-lived plant and animal species adapted to these ephemeral conditions complete their life cycles. The San Diego fairy shrimp is a habitat specialist for this kind of environment. Similar to other pool complexes, the pools at the SSTC-S are a mosaic of large and small interconnected pools.

Adult San Diego fairy shrimp are typically observed from January to March; however, in years with early or late rainfall, the hatching period may be extended. Shrimp appear when late fall, winter, or spring rains sufficiently fill their small, shallow pools with enough water to remain inundated for up to several months at a time (USFWS 2006a). In very dry years, the amount of ponding may be insufficient to promote hatching of fairy shrimp. They are filter feeders that digest microscopic particles of plant and animal detritus. Birds and other invertebrates prey upon the fairy shrimp that develop in these pools. One unique feature of fairy shrimp biology is their ability to remain in the soil, as egg-like cysts, for many years without hatching. Under appropriate, hydrated conditions, the shrimp can then hatch and reproduce (USFWS 2006a). The presence of these shrimp is sensitive to water temperature and chemistry. San Diego fairy shrimp appear to be sensitive to high water temperatures, and they cannot tolerate extremes in sodium or bicarbonate concentrations (Branchiopod Research Group 1996).

Regionally, habitat loss and degradation are reportedly the greatest ongoing threat to this species (USFWS 1997, 2007). At the time of listing, the USFWS determined that the continued survival of the species was threatened by habitat destruction from agricultural and urban development, alteration of wetland hydrology by draining, off-road vehicle activity, and replacement by other fairy shrimp species that are habitat generalists. Vehicle use, extremely limited available habitat (less than 81 hectares [200 acres] of vernal pools), and changes in hydrologic patterns in areas where they occur also continue to threaten this species. All of the known populations of the San Diego fairy shrimp were described as imperiled. San Diego fairy shrimp have a USFWS recovery priority of 2C, indicating that it is a species facing a high degree of threat but having a high potential for recovery. The "C" indicates that the species may be in conflict with construction or development projects (USFWS 1997). In 2008, the USFWS released a five-year review in which there was no change to the status of San Diego fairy shrimp. Recommendations for the next five years include the continued support of management, study, and conservation of fairy shrimp habitat.

Habitat loss occurs from destruction and modification of vernal pools due to filling, grading, disking, leveling, and other activities, as well as the modification of surrounding uplands that alters vernal pool watersheds, such as those that alter water runoff patterns (amounts and seasonal distribution) or reduce the size of the watershed. Besides the loss and fragmentation of habitat, the species is potentially threatened by pesticides, other pollutants, and drought (USFWS 2008). Drought is likely to decrease or terminate reproductive output as continuing drought situations may deplete cyst banks in affected pools.




| Occupied Pool # | Acres |
|---|---|
| 1 | 0.4532 |
| 2 | 0.0727 |
| 3 | 0.1224 |
| 4 | 0.0675 |
| 5 | 0.0096 |
| 6 | 0.0251 |
| 7 | 0.1895 |
| 10 | 2.1609 |
| 15 | 0.0391 |
| 16 | 1.2289 |
| 20 | 0.2787 |
| **Total** | **4.6476** |

**Figure 3.11-4: Location of San Diego Fairy Shrimp Occupied Pools at SSTC-S**

Indirect threats to the San Diego fairy shrimp occur because of alteration of supporting watersheds adjacent to vernal pools that change drainage patterns in the occupied pools (USFWS 2007). An increase in road runoff leads to ponding, making the pools vulnerable to invasion by marsh plant species that outcompete vernal pool plants and animals. At the other extreme, pools that are drained or blocked from their source of water are invaded by upland plants (Bauder 1987, Barry 1998). Any change in the maximum and minimum water temperatures can affect the San Diego fairy shrimp.

The USFWS (1997) also reports indirect impacts associated with disposal of waste materials into habitat for the San Diego fairy shrimp. Disposal of concrete, tires, and other trash adversely affects these animals by eliminating habitat, disrupting pool hydrology or, in some cases, releasing toxic substances (Bauder 1986, 1987). Malathion, herbicides, laundry detergent, fertilizer, and motor oil have been documented to be fatal to the San Diego fairy shrimp through poisoning of the animals or by the formation of a barrier to gas exchange on the surface of the water, which can result in asphyxiation (Branchiopod Research Group 1996). While none of the aforementioned activities has been documented at the SSTS-S pools, cyst crushing as a result of foot traffic and the establishment of trails, and resulting impacts related to soil compaction (Hathaway et al. 1996) could occur at these pools. However, such activities are not simplistically tied to fairy shrimp impacts and whether or not mortality occurs depends on inter-related and site-specific factors (Marty 2005, for example). Bullfrogs can also indirectly impact the San Diego fairy shrimp as they are a recognized predator (Morey 1996; Simovich et al. 1996) of vernal pool species and the USFWS recommends that eradication of larvae, post-metamorphic, and adult bullfrogs should be a task item in vernal pool management plans (USFWS 1998).

The criteria identified for protecting the San Diego fairy shrimp is that the pools and their associated watersheds “be secured from further loss and degradation in a configuration that maintains habitat functions and species viability” (USFWS 1998). The Recovery Plan recommends that secured vernal pools be enhanced or restored such that population levels of existing species are stable or increase for a minimum of 10 years before down- or delisting the species.

### 3.11.1.5 Other Special Status Species

A list of other, non-federally listed, special status species documented in the ROI is provided in Table 3.11-2 and known locations are shown in Figures 3.11-5 through 3.11-7. This list is derived based on species lists for Federal Candidate, Federal Species of Concern, State of California Endangered, California Special Concern species, CDFG fully protected, and plants considered sensitive by the California Native Plant Society. Special status birds are discussed in Section 3.12 and listed in Table 3.12-3. Species that reside strictly in the salt marsh or mudflat are considered unimpacted by activities; therefore, they are not included in this discussion. The silvery legless lizard was historically documented in the ROI, most recently in 1973 at Silver Strand State Beach based on a San Diego Natural History Museum record, but recent focused surveys did not detect this secretive lizard, which is usually buried. Focused surveys by RECON in 1998 did not detect it at SSTC-S, nor did general surveys in 2001-2002. It was also not detected on SSTC-N in 2005 with focused survey. It is considered unimpacted by the activities analyzed for the alternatives.

For those species of plants that are rare or endangered in California Native Plants Society (CNPS) 1B, and for wildlife classified as a federal or state species of concern, a brief natural history is presented in the following sections.

**Table 3.11-2: Other (Non-Federally Listed) Special Status Non-avian Species Documented in the Project Area**

| Common Name (Scientific Name) | Status | Habitat Preferences or Known Occurrence |
|---|---|---|
| Plants | | |
| Southwestern spiny rush (*Juncus acutus* var. *leopoldii*) | CNPS 4 | Salt marsh at SSTC-S and NASNI |
| Estuary suaeda (*Suaeda esteroa*) | CNPS 1B | Salt marsh at SSTC-S |
| Wooly seablite (*Suaeda taxifolia*) | CNPS 4 | Salt marsh at SSTC-S |
| San Diego County viguiera (Viguiera laciniata) | CNPS 4 | Coastal sage scrub at SSTC-S |
| San Diego barrel cactus (*Ferocactus viridescens*) | CNPS 2 | Maritime succulent scrub at SSTC-S |
| Variegated dudleya (*Dudleya variegata*) | CNPS 1B | Coastal sage scrub in rocky or clay soils; occasionally on margins of vernal pools (SSTC-S) |
| Nuttall’s lotus (*Lotus nuttallianus*) | CNPS 1B | Beach, coastal sage scrub (entire SSTC and NASNI) |
| Palmer’s frankenia (*Frankenia palmeri*) | CNPS 2 | SSTC-S |
| Coast woolly-heads (*Nemacaulis denudata* var. *denudata*) | CNPS 1B | Dunes (entire SSTC and NASNI) |
| Red sand-verbena (*Abronia maritima*) | CNPS 4 | Dunes (SSTC-S and NASNI) |
| Brand’s phacelia (*Phacelia stellaris*) | FC, CNPS 1B | Coastal strand (NASNI), upper beach areas of NBC Bravo and Charlie Training Areas |
| Non-avian Wildlife | | |
| Globose dune beetle (*Coelus globosus*) | FSC | Dunes at SSTC-S where sparsely vegetated |
| Sandy beach tiger beetle (*Cicendela hirticolis ssp. gravida*) | FSC | Throughout beaches on ocean side, except not documented on NASNI |
| Tiger beetle (*Cicindela latesignata* ssp. *latesignata*) | FSC | Sandy beach on west shore SSTC-S |
| Mudflat tiger beetle *(Cicendela trifusciata sigmoidea)* | CSC | Documented at NASNI (RECON 2004) |
| Wandering skipper (*Panoquina errans*) | FSC | Pickleweed series with salt grass (its food plant) |
| Silvery legless lizard (*Anniella pulchra pulchra*) | CSC | Loose or sandy soils for burrowing (SSTC-N/S) |
| San Diego black-tailed jackrabbit (*Lepus californicus bennettii*) | CSC | In coastal scrub, grassland, and ruderal areas (Delta North and South, SSTC-S, and NASNI) |

Status derived from the CDFG Special Animals Lists, July 2003, and the CNPS’s Inventory of Rare and Endangered Plants of California, 2001.
FC=Federal Candidate Species
FSC=Federal Species of Concern
CSC=California Special Concern Species
CDFG fully protected=Species may not be taken without permit from Fish and Game Commission
CNPS 1B=Rare or endangered in California and elsewhere
CNPS 2=Rare or endangered in California, more common elsewhere
CNPS 4= Limited distribution (Watch List)

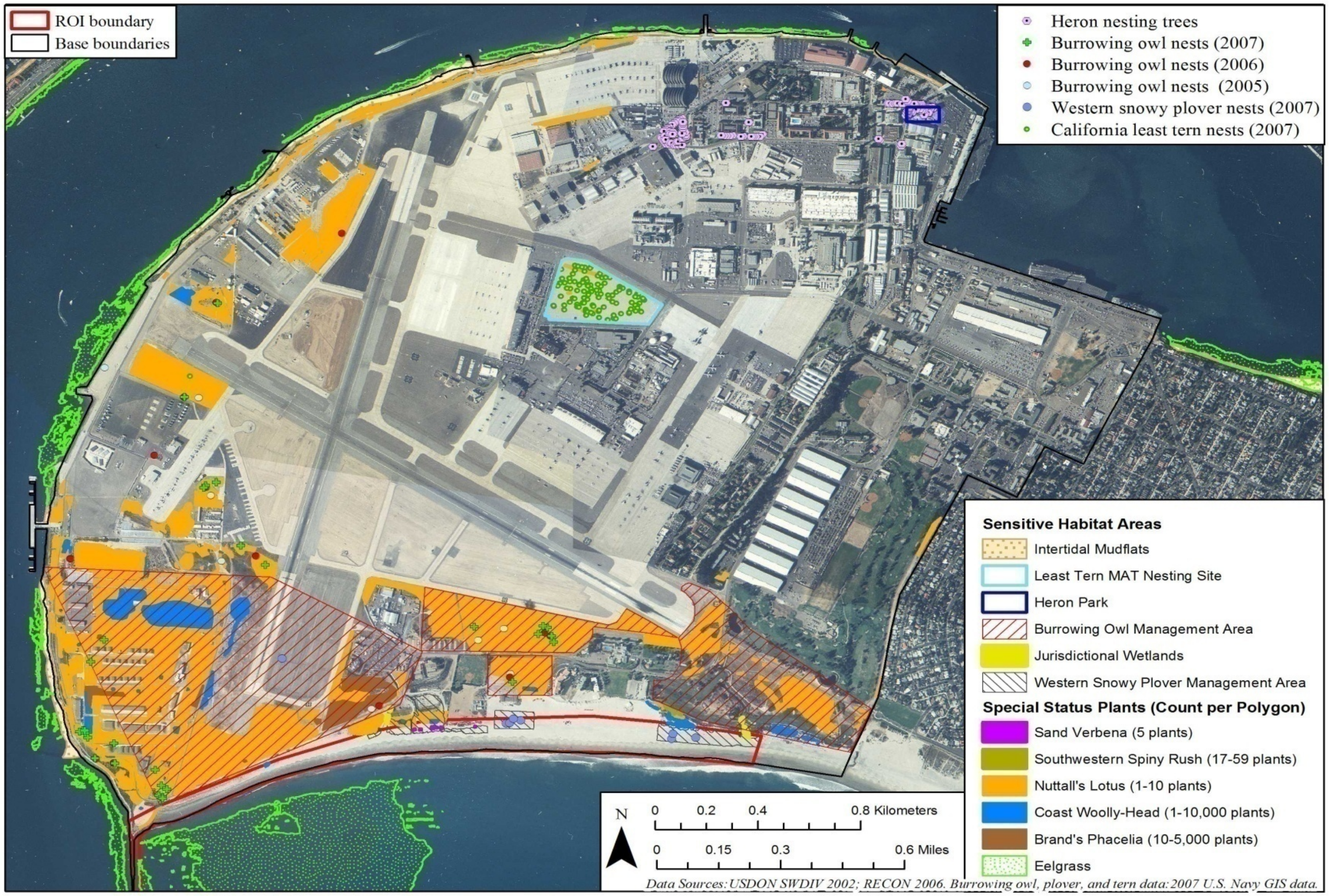



**Figure 3.11-5: Special Status Species and Habitats of NASNI**

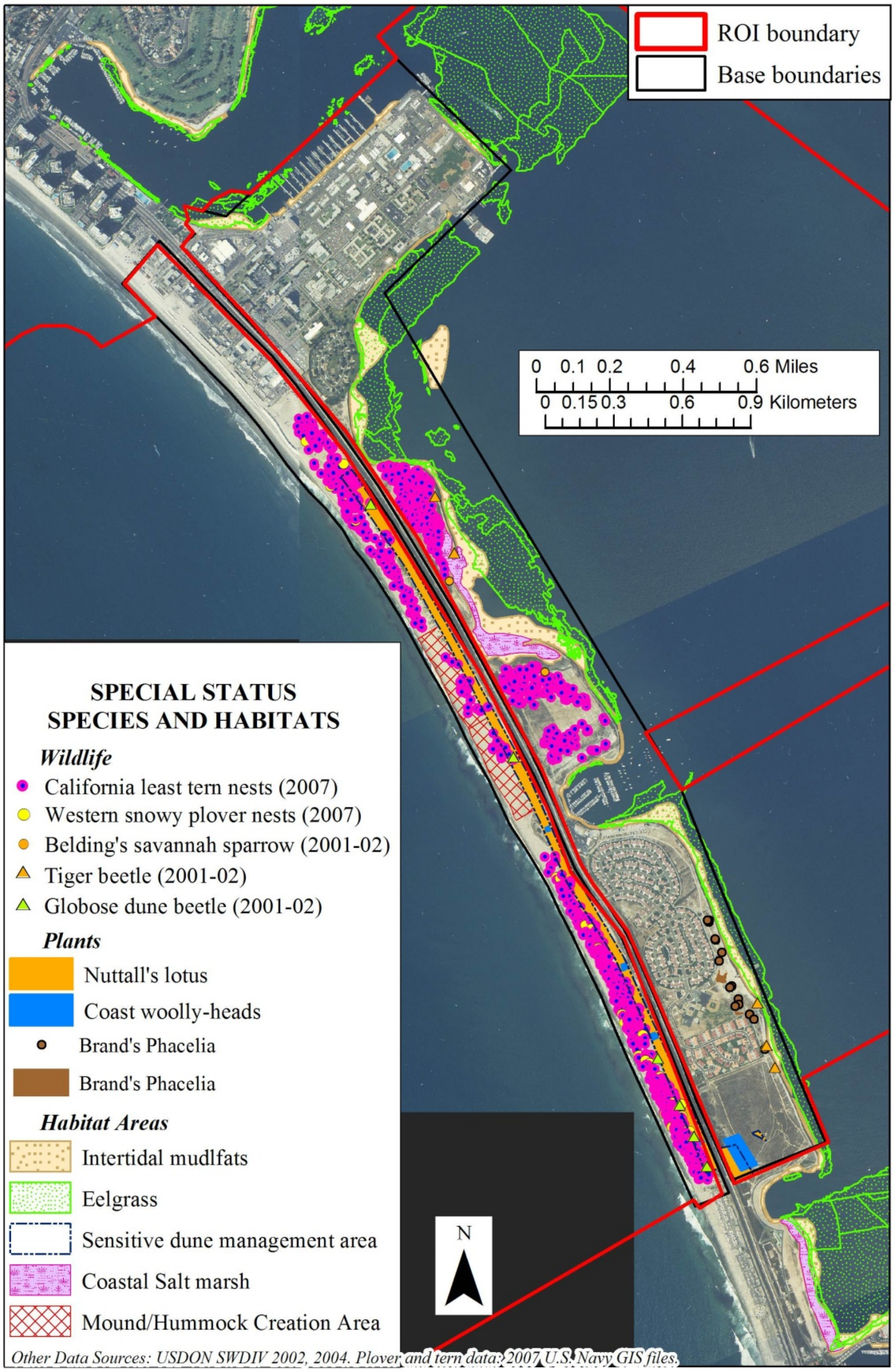
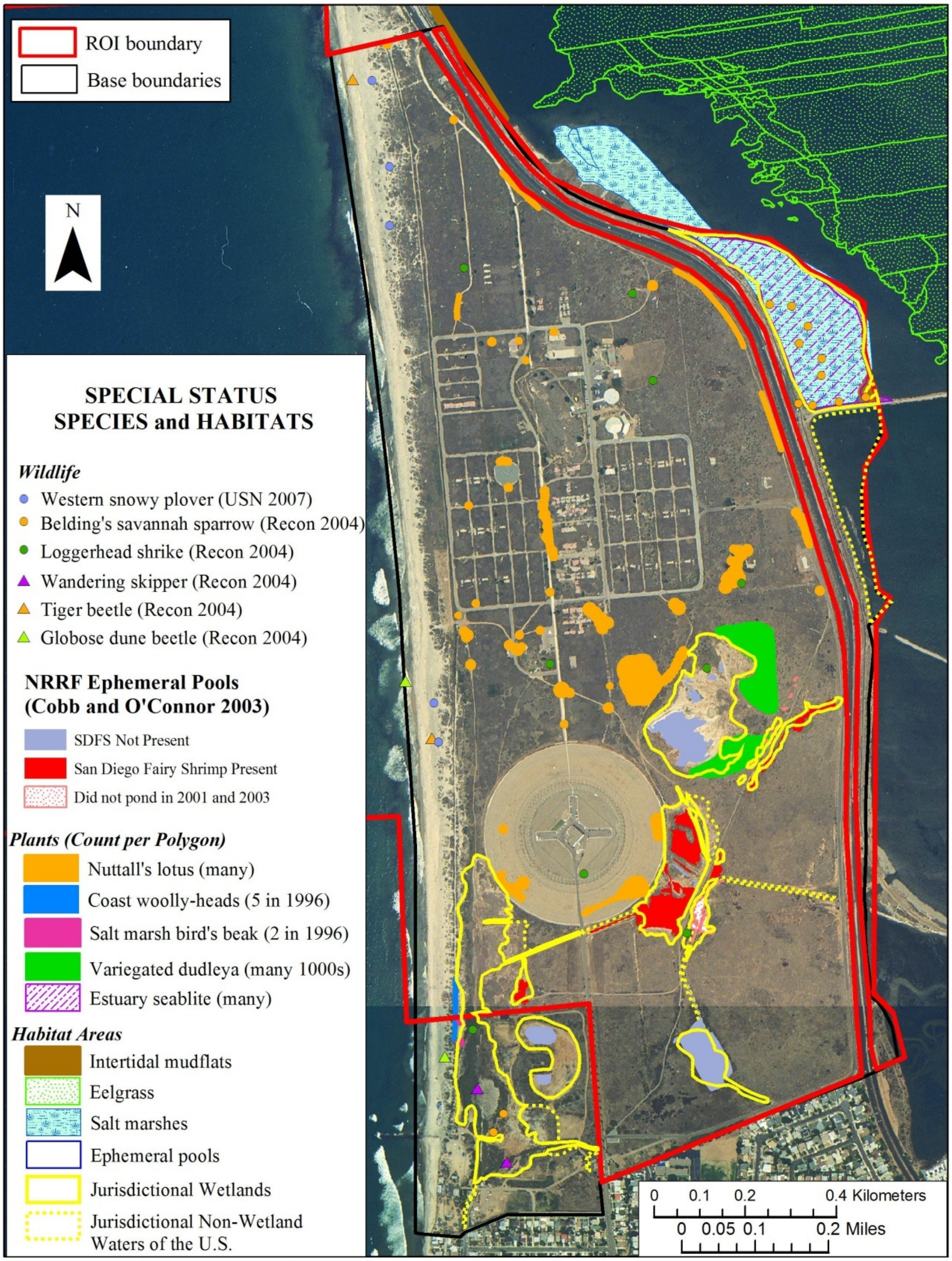



**Figure 3.11-6: Special Status Species and Habitats of SSTC-N (NAB Coronado)**



*Other Data Sources: USDON SWDIV 2002, 2004. Burrowing owl, plover: 2006 U.S. Navy GIS files.*

**Figure 3.11-7: Sensitive Species and Habitats of SSTC-S (NRRF)**

#### 3.11.1.5.1 Rare Plants with a CNPS 1B Status or Higher

#### Brand's phacelia

Brand's phacelia (*Phacelia stellaris*) is a Federal Candidate Species for listing under the ESA, as well as having a CNPS 1B status. Brand's phacelia is extremely rare, it is known from only five remnant occurrences in the U.S. Its historical range extended from Los Angeles County to the Mexican border and inland to Riverside County. Four of the five remaining populations are in San Diego County. This small annual forb has symmetric purple flowers and has been observed in the past in Riverside, Los Angeles, San Bernardino, and San Diego counties. It can be found at NASNI north of the northern border of the ROI and, recently discovered, at Charlie and Bravo training areas (Figure 3.11-8). Brand's phacelia also occurs on the 40-acre leased area to the State of California (California Natural Diversity Data Base 2009) just south of the mapped locations in Charlie and Bravo training areas. It is known from wash openings in coastal sage scrub (where the preferred sandy soils can be found) as well as from coastal dunes. About 5,000 Brand's phacelia were estimated on NASNI in 2004 (RECON 2005). The recent findings in the Bravo and Charlie training areas totaled over 2,080 individuals in 2009, although locations are spread out. Species density ranges from single individuals to one aggregate of 57 individuals, and the primary aggregation of over 2,000 individuals. Two additional locations near the SSTC are found along the shoreline of Mission Bay (CNDDB 2009).

#### Estuary seablite

Estuary seablite (*Suaeda esteroa*) is a perennial subshrub which is part of the Chenopodiaceae family, and flowers in late summer to fall. The distribution is rather widespread from Santa Barbara County into northwestern Mexico. This plant can be found within the salt marsh at the South Bay Marine Biological Study Area and inhabits coastal salt marshes, tidal banks, swamps, and channel margins; its typical elevation is under 10 feet. It is present within the salt marsh at SSTC-S. Estuary seablite is listed by CNPS at a 1B status, most likely due to its recent decline and diminishing habitat. The Jepson Interchange website (University of California Berkeley) has recorded observations of this species at multiple locations within San Diego County, including some near Chula Vista and Imperial Beach and a few at Silver Strand and Coronado.

The main threat that the estuary seablite faces is habitat reduction. Whether it is from development, recreation, or exotic species encroachment, the favored habitats of estuary seablite are often modified. This leads to very few untouched natural areas of coastal wetlands, and this species' scarcity. Minimizing the destructive effects of activities whenever possible as well as establishing certain restrictions where populations currently exist are actions that protect the species.

The estuary seablite, while existing within the ROI is not included in the effects analysis in this document because it is located completely in the South Bay Marine Biological Study Area salt marsh, an area where training activities are not proposed.

#### Variegated dudleya

Variegated dudleya is a species of perennial forb (an herb other than grass) that inhabits a variety of community types including: chaparral, coastal scrub, valley and foothill grasslands, and vernal pools. It can be found adjacent to vernal pools within SSTC-S. The yellow flowers are striking during the blooming period from April to June throughout San Diego County at elevations under 750 feet. Even though there is variability among possible habitats, variegated dudleya is only found in San Diego County and Baja California, and is listed by CNPS at a 1B status (rare, threatened, or endangered in California and elsewhere). This plant has been reported with 59 occurrences (CNPS 2010), ranging from SSTC to Lake Hodges to the north and as far inland as Jamul. SSTC-S is one of only three coastal locations of this species; the others are at Point Loma and La Jolla.

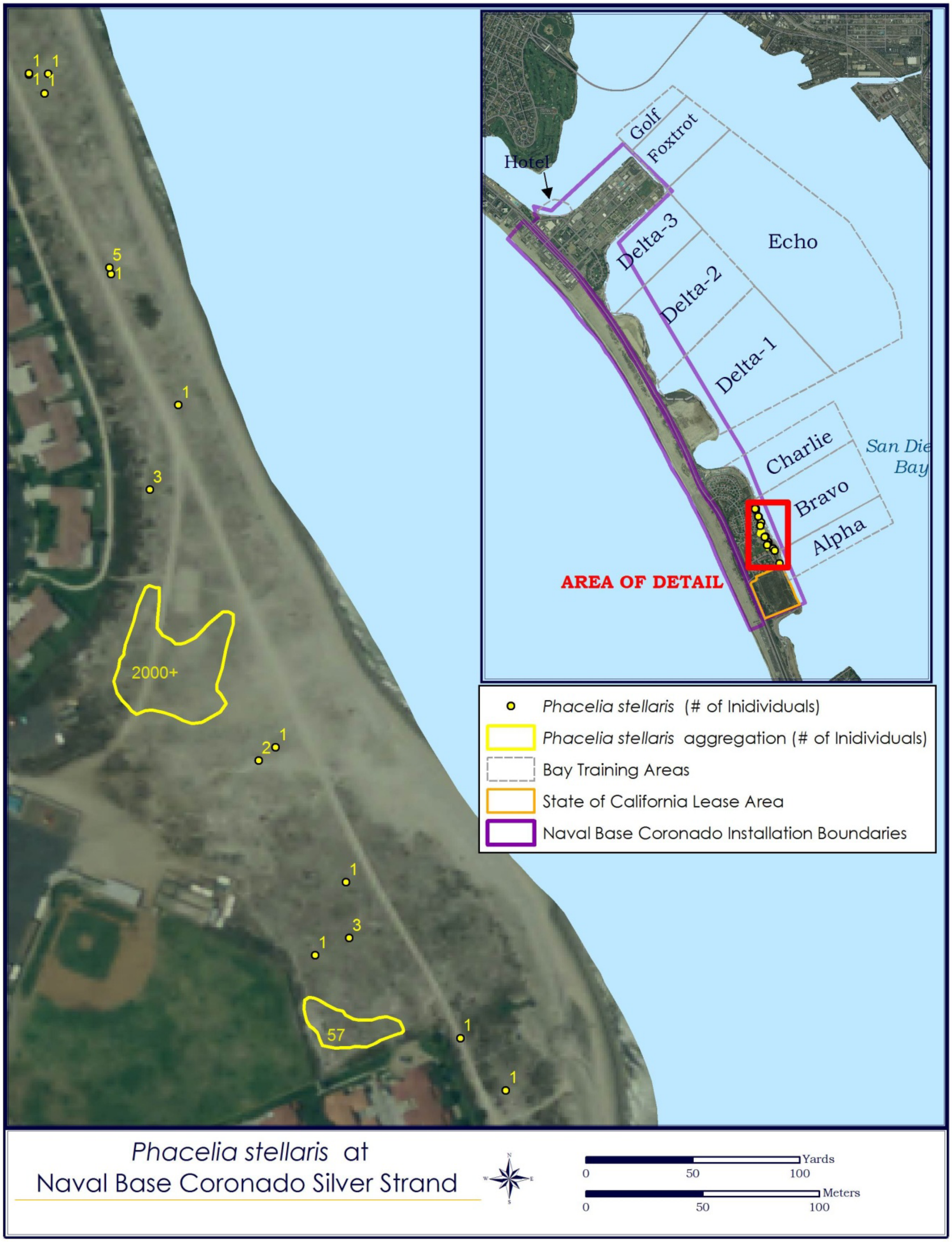



**Figure 3.11-8: Locations of Brand's Phacelia 2009**

Variegated dudleya is threatened by disturbance that is destructive to the vegetation structure. It often lives between rocks in crevices along washes and ephemeral pools. Some of these areas are prone to erosion and major events can wash away a seed stock as well as injure adult plants. The communities in which this plant occurs can change dramatically often with only a small amount of disturbance. This species is placed at risk by altered water flow and soil structure, and by invasive infestations.

### Nuttall's lotus

Nuttall's lotus (*Lotus nuttallianus*) is a vibrant member of the pea family that can be either annual or perennial. The species is primarily found within San Diego County. Historical collections have been reported in Orange and Ventura counties, but these populations have likely diminished due to development. This plant can be found at many northern locations at NASNI (Figure 3-11.4), bordering the ROI. It has also been observed on dunes on the oceanside of SSTC-N, and throughout the SSTC-S inland area (Figure 3-11.6). Nuttall's lotus flowers from March to June, displaying bright red buds that unfold into bilaterally symmetric yellow flowers. This species favors coastal communities such as dunes, beaches, and coastal sage scrub; thus it can exist anywhere at SSTC. It is a CNPS 1B status and is in serious decline. According to a study on NASNI it is known from fewer than 10 locations within the State (RECON 2006); that being said, it was reported as prevalent on NASNI.

The threats to Nuttall's lotus are similar to those of most rare coastal species, diminishing natural habitat. While this lotus species often thrives once established, establishment and advancement is strictly limited. Reduction of habitat and pristine ecosystems threaten this plant's ability to rebound. Exotics that often occur in these communities make expansion difficult by overcrowding and creating light limiting environments that inhibit seedling development.

### Coast woolly-heads

Coast woolly-heads (*Nemacaulis denudata* var. *denudata*) is an annual herb found in Los Angeles, Riverside, Orange and San Diego counties, and is listed by CNPS at a 1B status. It is found at NASNI near the northern border of the ROI, in addition to Delta Beach North and South. It is found on coastal sand dunes and beaches from April to September. Coast woolly-heads sprawls aggressively along the sand and is usually fairly abundant where it occurs. Favoring dunes and sandy soils, it can occur anywhere on SSTC. It was not documented during the most recent surveys at SSTC-S (RECON 2006) due to a drought year during surveys.

The main threats to coast woolly-heads are development and disturbance. While many beaches are not fully developed, conversion into a public beach, access area, or otherwise utilized region still results in disturbance at some level. This species can probably survive moderate levels of disturbance; however concentrated and frequent disturbance would diminish populations. Activities such as grading dunes and beaches could be severe to this species recovery, because such actions may disperse exotics and destroy healthy seed-producing coast woolly-heads.

## 3.11.1.5.2 Invertebrates

### Globose dune beetle

The globose dune beetle is a Federal Species of Concern that inhabits coastal sand dunes and sand hummocks in scattered localities from Bodega Head, Sonoma County to Ensenada, Baja California, as well as the Channel Islands (except San Clemente Island) (Nagano 1982a; Snover 1992). It is a small (approximately one centimeter), brown, oval-shaped beetle of the family Tenebrionidae. Throughout much of its range it co-occurs with the closely related ciliated dune beetle (*Coelus ciliatus*). Its population status has declined in recent years due to development of coastal areas and recreational use of remaining coastal dune habitats. Many of southern California's coastal dunes have also seen significant invasions by non-native plant species, which tend to be detrimental to native fauna, especially arthropods. The globose dune beetle spends the days burrowed into the sand beneath dune vegetation, and comes to the surface at night, leaving distinctive furrows in the sand around the perimeter of the vegetation. It feeds upon the leaves, twigs, seeds, and detritus of dune vegetation, both on the sand surface and below. It will also climb up into the plant canopies to feed. Overall it shows a marked preference for native plant species over invasive non-natives. One exception is the sea rocket, which is actually preferred by adults over the native dune ragweed (beach bur). However, in coastal areas sea rocket is an annual plant that dies off at the time of year when globose dune beetle larvae are approaching the end of their development period. Particularly detrimental is the iceplant *(Carpobrotus* spp.), which provides little or no food for dune beetles and most other dune arthropods. There are very few beetles and other dune arthropods found in the sands beneath iceplant stands (Nagano 1982a; Snover 1992 and unpublished data).

The globose dune beetle was proposed for listing as threatened in 1979, and was also a Category 2 species. In the San Diego Bay area, it has been found on the dunes at Silver Strand, as well as the coastal dune habitats near the SSTC-S where native plant species have not been crowded out by iceplant. Iceplant does occur in both areas and poses a direct threat to the continued persistence of the species.

### Sandy beach tiger beetle

The sandy beach tiger beetle (*Cinindela hirticollis gravid*) is a Federal Species of Concern usually found on sandy areas subject to tidal flow. Adult tiger beetles are 0.4 to 0.8 inches in length. They are active terrestrial predators morphologically adapted to stalk and hunt small arthropods; they are quick runners and agile fliers (Nagano 1980). This tiger beetle ranges from the San Francisco Bay area southward into Mexico and inhabits clean, dry, light-colored sand in the upper beach zone. The larvae that burrow in the sand are predaceous like the adults. According to Nagano (1980) and the Natural Diversity Database (NDDB) this subspecies is extant (exists) at only four localities in California. Nagano (1980) mentions the possibility of this beetle occurring on the Silver Strand. The beetle apparently is very sensitive to human contact. Threats to the species include offshore oil spills, improper use of insecticides, degradation of habitat, recreational activities, and reduction of prey species when kelp piles are removed from beaches (Nagano 1980).

Along the beach, tiger beetles are found at or just above the tide line where they feed on kelp flies. The larvae of kelp flies develop in and around the piles of rotting kelp deposited on the beach. Thousands of the flies may be found on the beaches under appropriate conditions and they are often fed upon by shore birds. At most beaches in southern California the kelp piles are removed to prevent the buildup of large numbers of flies or rotting debris, which reduces the available food source for tiger beetle species.

The 2001-2002 SSTC-S surveys and prior surveys have confirmed the presence of sandy beach tiger beetles at SSTC (RECON 2004). Sandy tiger beetles were found on the sandy beaches on the western side of NRRF. Historically sandy tiger beetles have been found in several locations adjacent to San Diego Bay, including Silver Strand and NAB Coronado (Nagano 1982a). It may still occur on the Silver Strand near NAB Coronado, but more field work is required to determine this.

### Tiger beetle

Tiger beetles (*Cincindela latesignata spp. latesignata*) are active terrestrial predators morphologically adapted to stalk and hunt small arthropods; they are quick runners and agile fliers (Nagano 1980). This tiger beetle inhabits the marine littoral zone on mudflats and sandy beaches in southern California and northwestern Baja California, Mexico. Tiger beetles will eat any arthropod they can overpower, such as isopods, moths, ants, and flies, including kelp flies (Nagano 1980). Tiger beetles are most active during periods of warm sunshine in the spring, summer, and fall (Nagano 1980). This species is listed as a Federal Species of Concern and the NDDB records for this species are considered sensitive by the CDFG and are not released to the public. In 1980, only two populations were known to be extant in California, at Chula Vista and Border Field State Park (Nagano 1980). Surveys after 1980 have confirmed the presence of a third population of this species on the Silver Strand (DoN 1998b). Tiger beetles have been found on the sandy beaches on the western side of SSTC-S.

#### Wandering skipper

The wandering skipper (*Panoquina errans*) is considered sensitive by conservation agencies and local specialists and is listed as a Federal Species of Concern. This species is found in coastal salt marshes near its host plant, saltgrass, and ranges from Santa Barbara, California to the tip of Baja California, Mexico. The wandering skipper is a yellow-brown skipper with cream-colored spots on the hindwing and pale yellow veins on its wings. There are populations in all of the marshes within San Diego County; the populations north of Peñasquitos Slough appear to be stable (Faulkner and Klein 2001). Adults fly from July to September. The primary threats to this species include habitat destruction and fragmentation.

The wandering skipper has been observed in the pickleweed series at Camp Surf; it is expected to occur in all areas of suitable habitat in the ROI (RECON 2004).

### 3.11.1.5.3 Amphibians and Reptiles

No sensitive amphibians or reptiles have been recently documented in the ROI. The only special status species with a potential to occur are the silvery legless lizard and the San Diego horned lizard *(Phrynosoma coronatum blainvillii)*, which have a number of historical records indicating presence in the area.

#### Silvery legless lizard

Sandy habitat of coastal dunes that support the silvery legless lizard occurs throughout the ROI. However, it was not found during the 2001-2002 surveys or during focused surveys for it in 1998 (DoN 1998b).

#### San Diego horned lizard

The San Diego horned lizard (*Phrynosoma cornatum blainvillii*) was formerly found in southern California distributed throughout the foothills and coastal plains from Los Angeles area to northern Baja California. It is currently a Federal Special Concern species (FSC) and a California Special Concern species. California Department of Fish and Game gives them full protection from collecting. The San Diego horned lizard was surveyed for at SSTC-S in 2001-2002 (RECON 2004). It was not detected and the surveyors attributed this to a lack of suitable habitat. They assessed the remnant coastal sage scrub patches to be too small to support a population of this species, and no native harvester ant forage (*Pogonomyrmex sp*.) was found. Such ants make up about 50 percent of the diet of this species.

### 3.11.1.5.4 Mammals

No focused surveys for bats have been conducted within the ROI, but a few special status bats have a moderate to high potential to occur. The western red bat (*Lasiurus blossevillii*) a CDFG Species of Special Concern, could occur in ornamental trees in landscaped areas of the ROI. The greater western mastiff bat (*Eumops perotis californicus*), a CDFG Species of Special Concern, may forage in the ROI. The pocketed free-tailed bat (*Nyctinomops femorosacca*), a CDFG Species of Special Concern, may also forage in the ROI.

The Pacific pocket mouse *(Perognathus longimembris pacificus)* was surveyed for at SSTC-S in 2002 using USFWS protocol trapping guidelines. It was not detected. Four transects were placed on-site within vegetation communities that exhibited suitable sandy soil conditions. Surveyors reported that the species is not expected to occur at SSTC-S due to lack of suitable habitat (RECON 2004).

### San Diego black-tailed jackrabbit

Occurring in semi-open coastal scrub, grassland, and ruderal areas on Delta North and South, SSTC-N ocean beaches, SSTC-S, and NASNI, the large (18 to 25 inches tall) San Diego black-tailed jackrabbit is characterized by large, long black-tipped ears, a black striped tail, and buffy brown coloration. It ranges from near Mt. Pinos (at the Kern-Ventura County line) southward and west of the southern California mountains into Baja California, Mexico (Hall 1981). This coastal form of the more widespread black-tailed jackrabbit is strictly herbivorous, preferring habitat with ample forage such as grasses and forbs. Forested and thick chaparral regions are not suitable (Bond 1977).

The San Diego black-tailed jackrabbit breeds throughout the year, with the greatest number of births occurring from April to May. This jackrabbit is commonly observed on NASNI, primarily in the ruderal habitats on the south side of NASNI. They are occasionally observed on the beach and in the sand verbena-beach bursage habitat as well. This species is also observed at SSTC-N, being managed on Delta North and South and sometimes occurring on the oceanside of SSTC-N. Although this animal is listed as a California Special Concern Species, this species is successfully breeding on NASNI and the population appears to be unique as it occurs in high densities within a low plant diversity habitat. This seeming contradiction may be due to a lack of large mammal predators.

The San Diego black-tailed jackrabbit has also been observed on numerous occasions within the coyote brush scrub, interior pickleweed, and coast prickly-pear habitat in the center of SSTC-S. It is assumed to be breeding successfully in the area, as both juveniles and adults have been observed. These local populations are important as the military land along the Silver Strand contains some of the last available habitat in the immediate region. The hare is nearly or completely extirpated from coastal lowlands of the region other than these locations.

## 3.11.1.6 Current Management and Mitigation Measures

Regulatory and management areas that are discussed in this section and earlier in this Chapter are depicted on Figures 3.11-9 and 3.11-10. The following sections identify general and specific management and mitigation measures that take place for terrestrial resources. However, the largest benefit to natural resources has arisen from Navy control of the SSTC; this control precludes the development of these lands in a manner similar to adjacent properties. The Navy needs these lands for the open space required for training; by restricting development and acting as a steward for the resources, the needs of sensitive habitats and special status species can be better met. The Navy's extensive and long-term engagement with its partner agencies in managing these resources has led to these natural resources thriving on Navy lands.

### 3.11.1.6.1 Integrated Natural Resources Management Plan

Navy natural resources are managed through INRMPs, which are intended to take an ecosystem approach to natural resources planning. These are long-term, collaborative strategies for managing natural resources as required by the Sikes Act Improvement Act of 1997 (SAIA). For the U.S Department of Defense (DoD), it 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 the plan. An INRMP's scope is largely defined by the SAIA, and the Navy's Environmental and Natural Resources Program Manual (Office of the Chief of Naval Operations Instruction [OPNAVINST] 5090.1C October 2007).

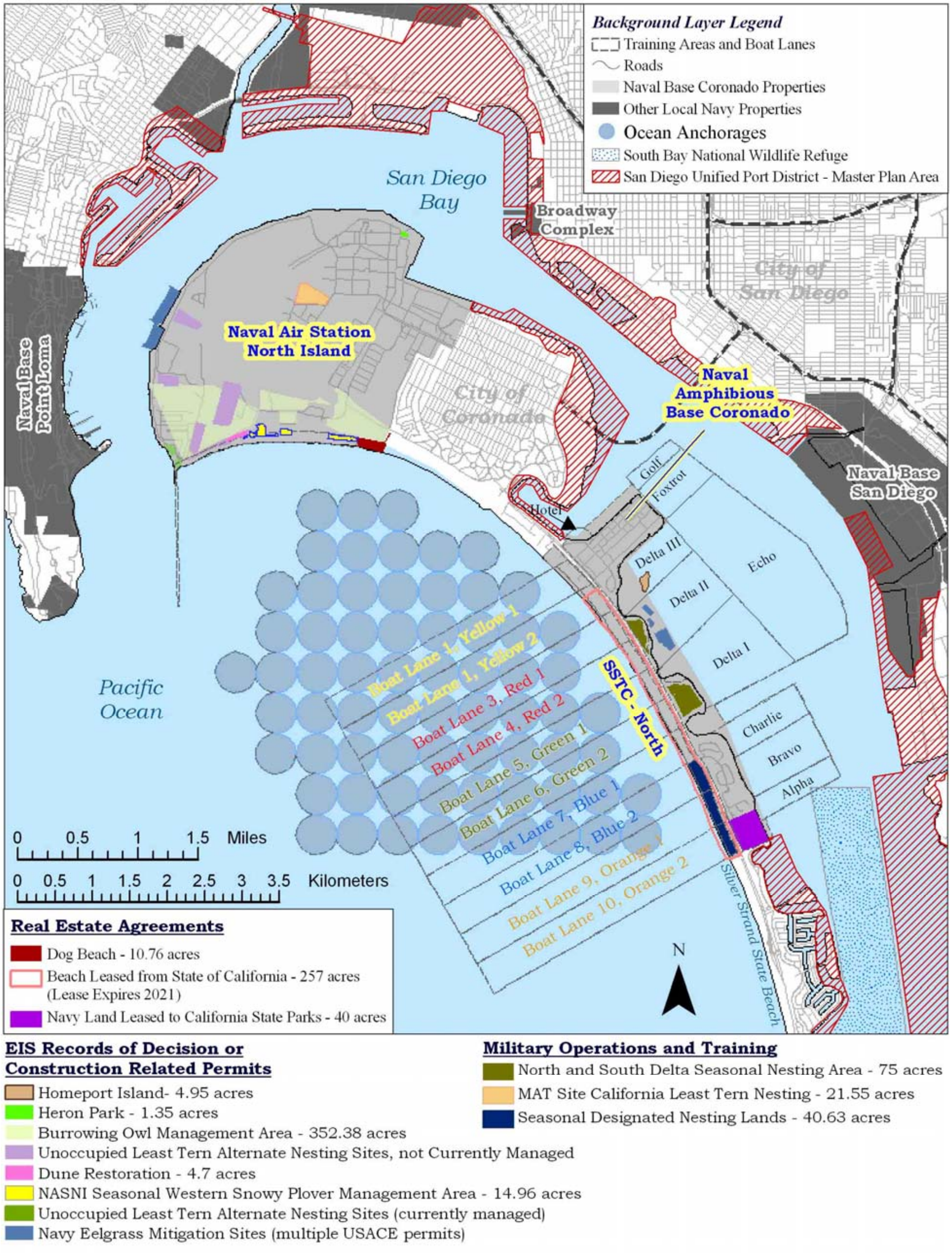



**Figure 3.11-9: Regulatory Management Areas and Real Estate Summary for NASNI and SSTC-N**

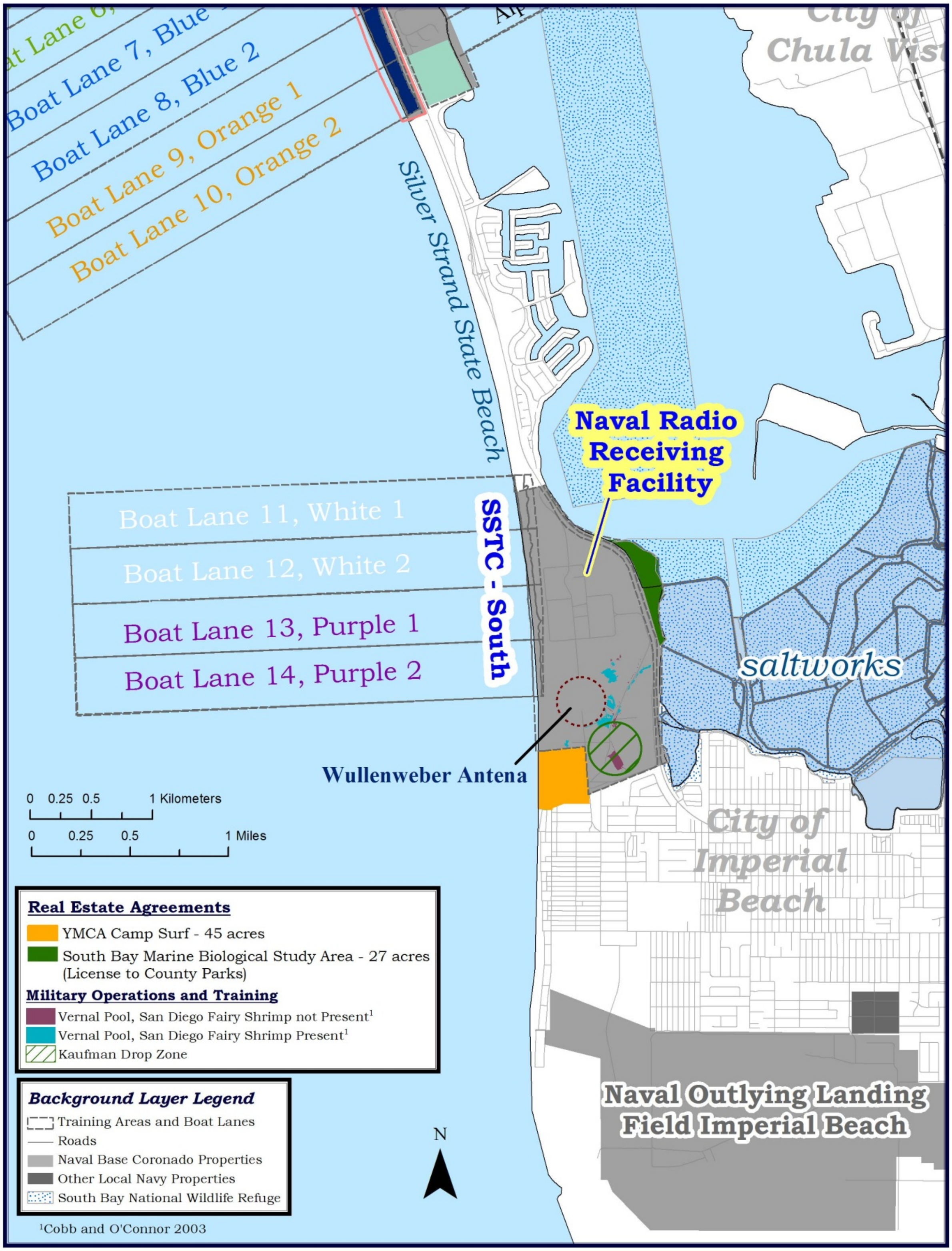



**Figure 3.11-10: Regulatory Management Areas and Real Estate Summaries for SSTC-S (NRRF)**

INRMPs, as defined under the SAIA are developed jointly by the Navy and fish and wildlife agencies such as the CDFG, USFWS, 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. For this reason, there is a long history of collaboration between the Navy and its agency partners in managing resources of the SSTC. As a result of this and the implementation of INRMP strategies by Navy natural resources professionals, the Navy management program is successful and occurs in a multiple-use environment. Terrestrial and marine aspects of natural resources management are addressed in the NBC INRMP. Marine aspects are also addressed in the San Diego Bay INRMP. The NBC INRMP was completed in 2002 and is in the process of being revised; natural resources staff also provides day-to-day management based on current circumstances. The San Diego Bay INRMP is also in the process of being revised.

### Terrestrial Habitat and Vegetation Management

Terrestrial habitats and vegetation have benefited from implementation of INRMP-funded projects such as invasive species control and habitat enhancement, but also as a collateral benefit of the long-term collaborative approach undertaken by the Navy and its partner agencies to protect nesting, federally listed birds (Section 3.12).

The protected status of certain aquatic habitats under Section 404 of the CWA, as well as occupation of certain of these habitats by federally listed species (San Diego fairy shrimp and the clapper rail), have also framed the management of these areas. The jurisdictional status of wetlands and waters under Section 404 of the CWA drives certain management actions. Jurisdictional status was evaluated on SSTC-S in 2002 (RECON 2004) NAB, and NASNI in 2004 (RECON 2006) (Figures 3.11-11 through 3.11-13). A total of 0.2 acres of wetlands and 64.3 acres of non-wetland jurisdictional waters of the U.S. were delineated at NASNI. At SSTC-S, a total of 59.6 acres of wetlands and 11.3 acres of non-wetland jurisdictional waters of the U.S. were delineated. The 1998 wetland delineation had identified 62.8 acres of jurisdictional wetlands and 13.3 acres of jurisdictional waters of the U.S. The difference in acreage mapped in 2002 may be attributed to a lack of ponding water when compared to results from data taken in wet years such as 1998 and 2001 (DoN 1998b; Cobb and O'Connor 2003). At NAB, jurisdictional wetland boundaries are approximated based on the map of vegetation communities and cover types, which is considered the approximate acreage mapped for a salt marsh (Figure 3.11-12).

The Navy has an established management program for vegetation and soils. Revegetation and habitat enhancement are important elements of the Navy program, such as on the dunes and for vernal pools Vegetation management includes the survey and monitoring of federally listed and other special status species. It also includes a prioritization program for invasive species control. Invasive plant issues related to the implementation of specific projects or activities are minimized through pre-project planning. High-priority invasive plants are targeted for control. The landscaping guidelines for the Navy prohibit the planting of species listed on the California Invasive Plant Council Invasive Plant Inventory, all non-native grasses (except those used for turf/lawns), and other non-native species observed or expected to have the potential to become invasive at the installation. Current management also includes delineation and monitoring of wetlands, and implementing avoidance and minimization measures as necessary to ensure no net loss of these areas under the CWA. Other management is accomplished through habitat protection as described above, and through public access limits to natural resource areas.

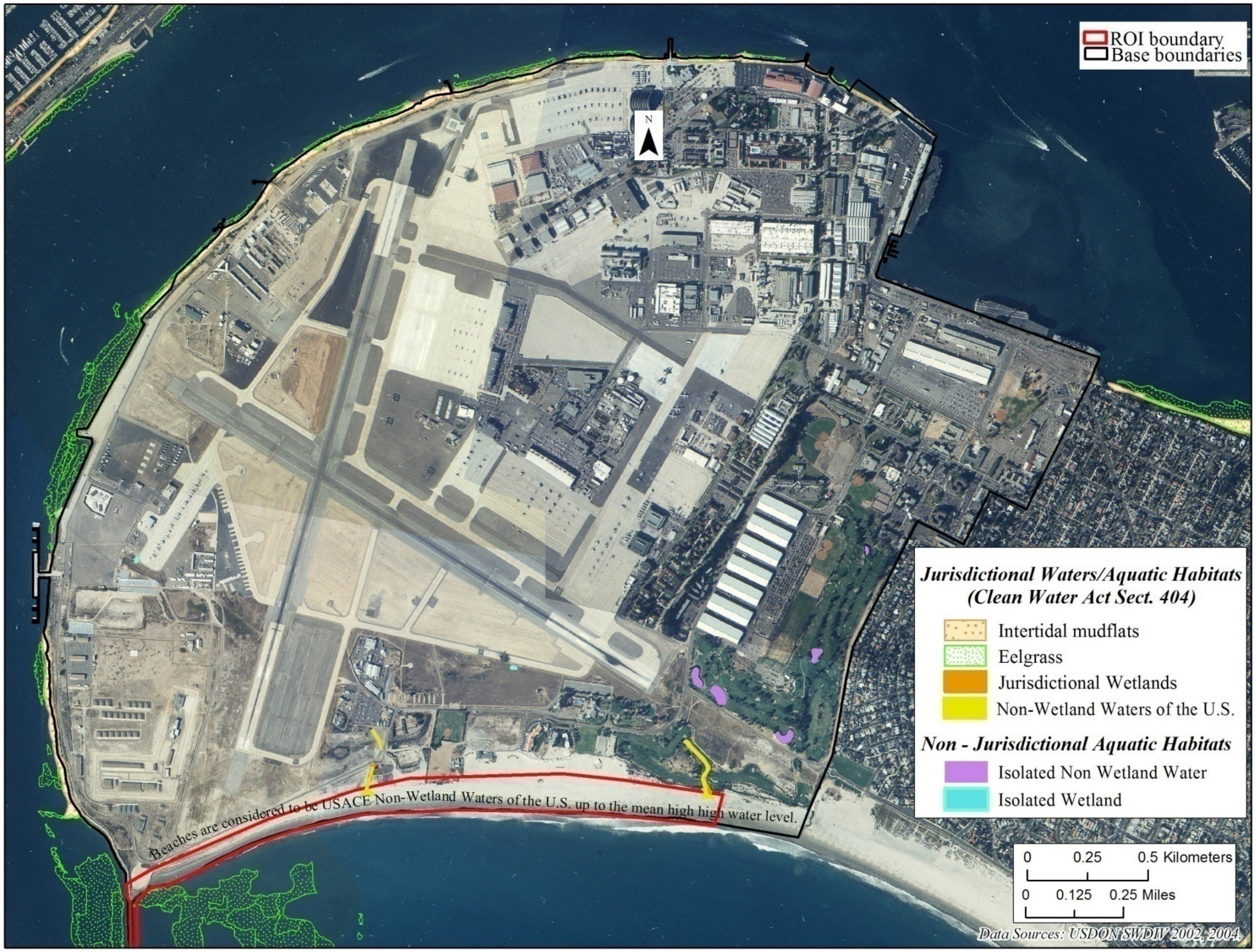



**Figure 3.11-11: Aquatic Habitats of NASNI and Their Jurisdictional Status**


**Figure 3.11-12: Aquatic Habitats of SSTC-N and Their Jurisdictional Status**

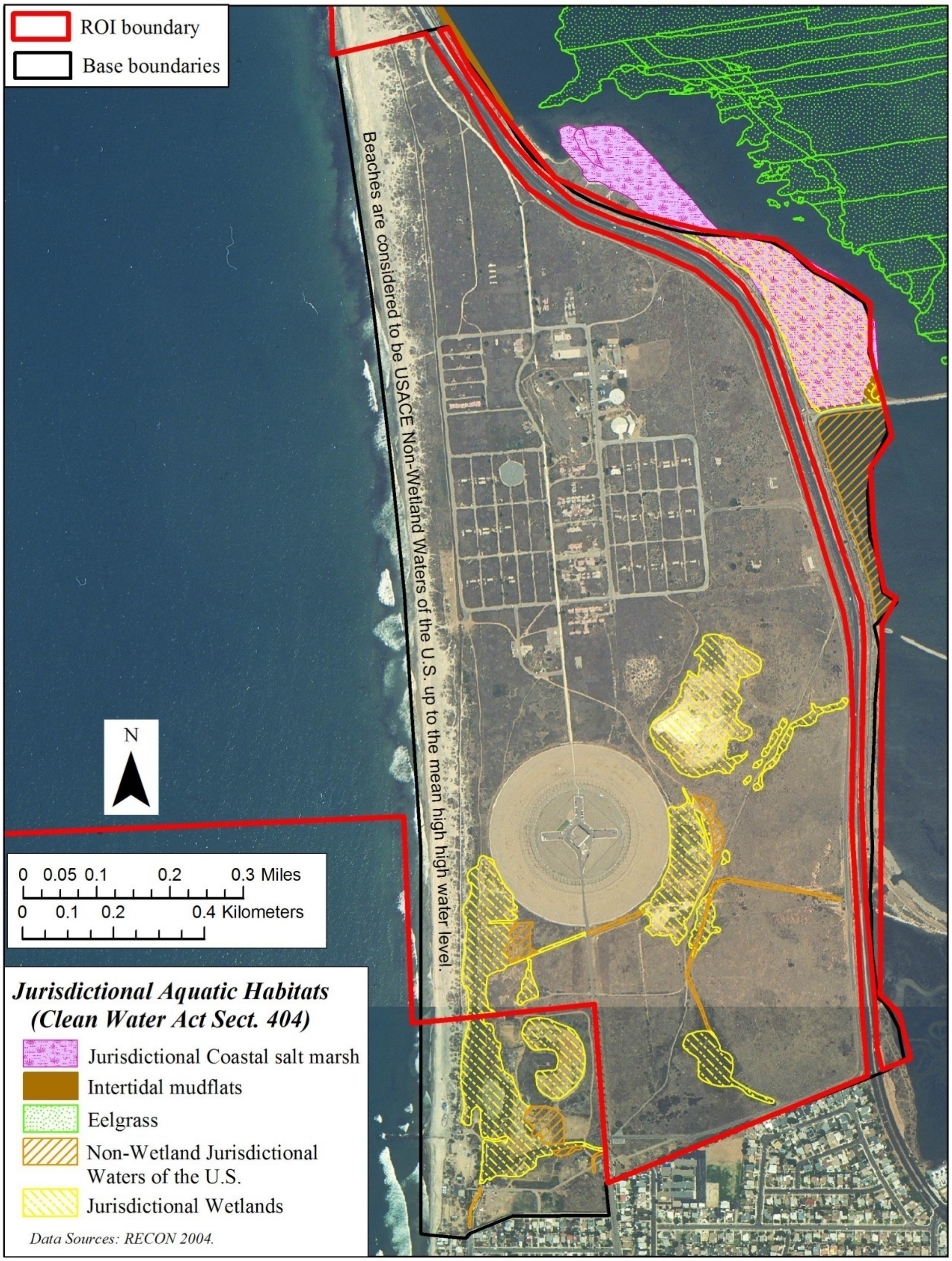



**Figure 3.11-13: Aquatic Habitats of SSTC-S (NRRF) and Their Jurisdictional Status**

The elements of the California least tern and western snowy plover management program and the requirements of related Biological Opinions dominate the Navy's natural resources strategy in the ROI, and therefore influence the habitat condition of vegetation, and the status of plant and other wildlife species. For instance, as stated below, vegetation and the soil substrate are prepared and managed to attract the least tern in designated nesting areas at Delta Beach North and South, while marking for avoidance special status plant species. In active training lanes where conflict may occur with operations, historic site preparation may include means to discourage nesting before the terns arrive in the spring, such as the creation of sand hummocks. At NASNI, vegetation is mowed consistent with BASH reduction while accommodating special status plants such as Brand's phacelia.

#### *Delta Beach North and South*

Delta Beach North and Delta Beach South are managed as a preserve for the California least tern, although military training is not restricted outside of the nesting season. Past management measures of these lands that were partly created by fill have included grading, disking, fencing, signage, and herbicide application, Prior to disturbances such as grading or herbicide treatment, the locations of two sensitive plants, Nuttall's lotus and coast woolly-heads, are marked to minimize the impacts to these species. Some patches of beach evening primrose (*Camissonia cheiranthifolia*) are also avoided. While the primary vegetation condition is sparse, low cover on the Delta beaches, tidal mudflats and salt marsh rim the shoreward edge of both properties. The marsh between Delta Beach North and South is about 12 acres in area. Dune areas are included in the annual base-wide invasive non-native plant control program.

#### *Dune Management*

A dune management area along the ocean side of NASNI provides broad-based ecological benefits as a habitat restoration project.

A second dune restoration site (1.2 acres) is bayside at NASNI and is intended to restore sand verbena-beach bursage habitat and Nuttall's lotus individuals affected by the remediation of smelter slag wastes disposed at the site from 1943 to 1967 (AMEC 2003). Qualitative and quantitative monitoring is conducted. Maintenance and monitoring includes regularly maintaining the native dune habitat landscape and the evapotranspiration cover plant species in the Waste Consolidation Area.

Invasive species removal is a regular activity on all dune areas.

### Habitat Areas that are Leased or Licensed

In the project area entire habitats are protected through special-purpose leases or licenses to the CDPR, the City of Coronado for a South Bay Marine Biological Study Area, the City of Coronado for a dog walking beach, and the YMCA for a youth surf camp.

#### *South Bay Marine Biological Study Area*

The South Bay Marine Biological Study is a 27-acre site in the northeast corner of SSTC-S that is leased to the City of Coronado (as of February 2009). Until recently, the property had been leased to the County of San Diego. Starting in 1974, the Navy issued five-year licenses to San Diego County for "the establishment of an Educational Ecological Preserve which is open to the public," with use limited to the study of marine biology and open to the students of the Unified School Districts of San Diego County. As conditions of the lease, the Navy requires a parking limit of 50 cars, and compliance with the CWA's Section 404 conditions for wetlands. The site contains 26.35 acres of "federally protected wetlands" and the lessee cannot conduct any manipulation projects, including restoration, without a "Modification of License" from the U.S. Navy to ensure Section 404 permit compliance.

#### *YMCA Camp Surf*

YMCA Camp Surf operates on the southwestern 45 acres of SSTC-S on land leased from the U.S. Navy in a long-term agreement that expires in 2048. The YMCA pays for their current lease by maintaining and enhancing the natural resources of the leased property which includes maintenance of fences, invasive weed control, and signage.

#### *Lease to California Department of Parks and Recreation*

The 40-acre NAB Coronado parcel leased to CDPR supports the wandering skipper, a Federal Species of Concern, and Brand's phacelia, which is a Federal Candidate Species for listing under the ESA. The San Diego Coastal State Park System General Plan (1984) guides the management of the 40-acre parcel leased to CDPR. The purpose is to preserve and protect opportunities for the public to enjoy quality beaches and to provide recreational opportunities in the ocean and nearshore environments.

#### *Salt Pond Connection to South San Diego Bay National Wildlife Refuge*

A portion of SSTC-S that includes a salt pond and associated levee ("Pond 11" in the NWR Comprehensive Conservation Plan [CCP]; USFWS 2006) is part of the NWR's Approved Acquisition Area. The USFWS may seek a lease agreement with the Navy in this area; at a minimum, the CCP states that the NWR may seek approval to alter the current conditions in the northwestern corner of Pond 11 (USFWS 2006). The Navy also owns and manages 35 acres of open water and associated intertidal habitat within the NWR's approved acquisition boundary. According to the CCP, no management actions are proposed for the NWR on submerged lands north of and adjacent to Emory Cove that would restrict Navy access to SSTC-S (USFWS 2006). However, the Navy provided comments on the NWR CCP regarding NWR plans in the vicinity of the Emory Cove as well as other areas that could result in habitat changes that affect Navy activities or that convert habitat for least terns and snowy plovers at the NWR (16 November 2001 Ser N45RN.tc/353; 23 August 2004 5216 Ser NOOC/43619; September 2005 Ser N45JNW.tc/0313). The Navy requested that the USFWS plans avoid reducing or modifying the amount of habitat available for the California least tern or western snowy plover such that Navy lands would have a higher proportion of available habitat for these species; that proposed NWR activities adjacent to and north of Emory Cove be modified; that all land and water owned by the Navy at SSTC-S be removed from the CCP; and that management recommendations that increase the presence of gull-billed terns be changed. In 2009, the USFWS, Port of San Diego, and California State Coastal Conservancy completed an Environmental Assessment for the restoration and enhancement of the South San Diego Bay wetlands, including restoration of Ponds 10 and 11. The planned restoration of these ponds includes returning much of the open water habitat to salt marsh by breaching the current levees and restoring tidal flows. The USFWS is currently planning construction activities to begin the fall of 2010 and establishment of a salt marshland to require several years.

### 3.11.1.6.2 Species-Specific Management and Mitigation Measures

In addition to the current management elements of the Natural Resources Program (Section 3.11.1.6), impacts are avoided or minimized through pre-project site approval and planning process. All species groups are managed through implementing habitat and species conservation guidelines and projects identified in the INRMPs. At a minimum an extensive invasive plant control program is implemented annually in the ROI. Natural resources staff adapts strategies based on the INRMP, personal observation, or new information such as resource inventories, weather, operational requirements, etc.

A Metro Area Instruction and Family Housing Occupant Handbook has been developed to advise personnel of what to do if they come in contact with sick, dead or injured wildlife. There is a DoD Instruction, Chief of Naval Operations Letter (5090 Ser N456M/1U595820 of 10 Jan 2002), and NBC Instruction regarding pet management. Except for dogs restrained by fences in family housing areas, animals (including cats and birds) are not permitted to run loose on Navy property. Possession or feeding of wild animals (including feral animals), regardless of docility or tameness, is prohibited. All dogs must be licensed, registered with security, and confined to a leash. Stray/loose animals should be reported to San Diego County Animal Control or Station Police for violations of policy. The Family Housing Occupant Handbook contains guidelines for properly disposing of trash so as not to attract feral animals. NBC has a domestic cat management policy associated with the housing area. Cats are not allowed to be loose outdoors, nor may pet food be left outdoors.

A Metro Area Pest Management Plan (per OPNAVINST 6250.4B) has been finalized (December 2009) that directs how the Navy uses pesticides and herbicides in the ROI, including means to protect non-target plants and wildlife. DoD and Navy policies require that use of pesticides is minimized on their property (OPNAVINST 5090.1C [30 October 2007]). The pest management plan incorporates new direction for management of invasives on DoD installations (EO 13112 of February 3, 1999 and July 14, 2000 DoD implementing direction). Chapter 17 of OPNAVINST 5090.1C requires that the use of pesticides comply with applicable regulations to prevent pollution.

### Management of Special Status Plants

Five rare plants (with a CNPS 1B status or higher) exist within the area of influence of the SSTC: Brand’s phacelia, coast woolly-heads, variegated dudleya, estuary suaeda, and Nuttall’s lotus. All are considered rare by the California Native Plant Society, while Brand’s phacelia is a Federal Candidate species under the ESA. These special status plants are managed through habitat protection, described above, but most occur in areas that receive some degree of use. As part of the project siting process, avoidance measures are undertaken, where practicable, to protect these special status plants. Known locations are mapped, and site-specific surveys are conducted to confirm the locations of sensitive plants. Invasive plant control and some habitat enhancement are periodically undertaken by the Navy as part of INRMP project planning.

Specific mitigation measures from past projects are sometimes undertaken. When 14 acres of upland were excavated for the first nuclear carrier berthing project in 1995, the Navy agreed to establish a seed bank for Nuttall’s lotus. To minimize impacts to these species, locations of special status species are marked prior to routine grading on Delta Beach North and Delta Beach South. When herbicide is used, it is applied to target species only; weed crews are able to distinguish between target and non-target species.

Brand’s phacelia is an extremely rare species managed through habitat protection, inventory, and monitoring. It was recently listed as a Candidate species by the USFWS. When Brand’s phacelia was mapped on NASNI, the population number was estimated at approximately 5,000 individuals occurring in an area south of the airfield. The current mowing of the habitat around the airfield does not appear to negatively affect this species and may, in fact, reduce competition with non-native grasses. The Navy has been removing iceplant from this area for the past several years through a combination of herbicide application and hand-pulling. The newly discovered populations in Bravo and Charlie training areas receive similar management treatment through INRMP-funded inventory, monitoring, and invasive species control. The population that exists on the 40-acre lease is adjacent to Alpha training area, but is not part of the Proposed Action for this EIS.

### Management of San Diego Fairy Shrimp

Current management of vernal pools restricts all activities from the pools at all times. Vehicle traffic in the inland area of SSTC-S is always limited to roads. Vehicle traffic adjacent to vernal pools is limited to paved roads. The Navy will continue to prohibit 1) training activities in and around all of the vernal pools when they are wet; 2) driving of vehicles off of established roads at SSTC-S Inland, year round. Only emergency or security vehicles will infrequently be driven on unpaved roads.

### 3.11.2 Environmental Consequences

The types of training activities that could affect terrestrial biological resources are those that take place on land in the ROI. These activities were divided into actions that occur in a defined manner and space, and which can be assessed for their impact on the environment. Each of these actions may be found in common among multiple training activities; and the increase in training tempo between the No Action Alternative and Alternatives 1 and 2 were assessed for associated increase to the actions contained within. These events are amphibious and beach actions, vehicle use, fluid transfer actions, foot traffic, manual excavations, and inland activities at SSTC-S. Information about the location where the activities take place, as well as their footprint, was obtained through interviews with Navy training professionals.

Several activities do not have the potential to impact non-avian terrestrial biological resources and have been excluded from this analysis. These activities are detailed below along with a brief description of the reason they were discounted. Included in these are activities such as aircraft activities, pyrotechnics including simunitions and blanks, boat maneuvers below the high tide line, and underwater detonations. Activities that consist entirely of these types of actions are not carried forward in this EIS.

Activities which contain air actions that are excluded from this analysis are numbered 4, 6, 7, 16, 25, 26, 29, 30, 35, and 66 (Table 2-1) and proposed activities N4, N5, N6, N7 (Table 2-2). Air activities consist of helicopter or fixed-wing flight take offs, landings, and operation practice. Many of the training activities that utilize helicopters do so over the nearshore ocean environment; the helicopters are used for transport and dropping individuals off into the water where they will either swim to shore or perform exercises in the water. While the majority of helicopter activities occur at distances too great to influence terrestrial communities, a small proportion of activities (Activity 25, and 64, Table 2-1) occur at SSTC-S where they may land or hover over the inland areas to drop off or pick up personnel. Landings take place on a designated landing pad inland at SSTC-S or in primarily iceplant vegetation of SSTC-S. During this activity, plants and animals are temporarily displaced due to rotor-wash, blowing sand, and other blowing debris. However, the number of potential helicopter activities that occur along SSTC-S is low and does not occur in the same location each time. Given the minimal area directly affected by helicopter activities and the low number of activities occurring in this area, the anticipated potential effects on terrestrial resources are localized and temporary. Considering that these activities take place at various locations, the effect may be even more ephemeral on terrestrial vegetation or soils. In the inland area of SSTC-S, mammals such as the San Diego black-tailed jackrabbit could startle or exhibit defensive behaviors. However, this effect is considered short-term and related to individuals only, and without lasting impact to a population (Bowles 1995).

The use of pyrotechnics, including simunitions and blanks, are not carried forward for analysis for terrestrial biological resources. The use of pyrotechnics (smoke grenades and flares as well as blasting caps), small arms, and blanks takes place in designated areas. Blasting caps, not counting those used offshore, are used during approximately 189 training events under the No Action Alternative, and smoke grenades and flares are used during approximately 760 training exercises (Appendix C). Under Alternative 1 the use of smoke grenades and flares would increase; they would be used during approximately 1,165 training activities. The use of blasting caps would increase to 279 training exercises during Alternative 1.

Simunitions and blanks are used in approximately 360 training activities under the No Action Alternative and the use would increase by approximately 30 percent (from 290,000 to 375,000 units) under Alternative 1 (Appendix C). The effects of this activity are the same or less than that associated with firing of pyrotechnics, covered above. A blank produces a noise with a Sound Exposure Level (SEL) of about 89 decibels A-weighted (dBA), at a distance of 750 feet. Small arms firing can produce peak noise levels of 90 to 100 decibels (dB) at 500 feet and 80 to 90 dB at 1,000 feet for the most common types of small arms. Most blank ammunition for small arms has a smaller propellant charge than that used for live ammunition. As a result, noise from small arms blank ammunition generates levels about four decibels below those of live ammunition.

These activities generate noise (flares and smoke grenades are expected to have a SEL range of 60 to 65 dB at 50 feet [U.S. Army 2003]), and sometimes illumination and smoke. Such activities that may generate a startle response for the black-tailed jackrabbit or other wildlife are discounted from analysis for non-avian terrestrial wildlife because this effect is not quantifiable compared to background noise, and not separable from a startle response due to human or vehicle movement in the area (analyzed separately under foot traffic and vehicle use). Larkin (2004) found that impacts on wildlife as a result of increased sound levels were difficult to quantify because the evaluation of sound in the environment is linked to human reaction (annoyance level), and the literature base for evaluating how sound may affect wildlife is limited. Animals have different hearing thresholds, and even within the same species may perceive sounds differently based on their life history; for instance, some are more tenacious while nesting than other life stages, and do not flush as easily. Despite the high frequency of noise-generating activities, they are dispersed through a large area compared to the area of potential noise impact from weapons or pyrotechnics, and the potential for direct interface with the black-tailed jackrabbit and other terrestrial wildlife is low. Any effect is considered short-term, related to individuals only, and without lasting impact to a population (Bowles 1995).

Animals also habituate to noise, and perceive sound differently based on background noise in the environment. What may be considered an adverse effect on one particular species, or individual, may not translate into the same type of effect on another species or individual. No multispecies study has found all species to be sensitive (Kaseloo 2005). Wildlife in the action area are likely to be habituated to noise sources due to their local frequency, intensity, and duration. Besides the ocean surf, traffic along SR 75 also generates background noise and ground vibrations that is perceivable to some terrestrial wildlife. Human noise from people at local schools and residences adjacent to habitat may also be audible to wildlife. The current instrument approach used by fixed wing and rotary wing aircraft to Runway 29, NASNI, is from south to north and follows the centerline of San Diego Bay at an altitude of between 1,600 and 2,300 feet, adjacent to and partly overlapping the ROI. Within this “San Diego Bay approach” corridor, military aircraft operate at altitudes of between 500 and 800 feet. Similarly, departures from Runway 36, NASNI, travel from north to south, down the middle of San Diego Bay at an altitude of about 500 feet. These flights leave the airspace above San Diego Bay either to the southeast at about the location of the South Bay Power Plant or to the southwest over SSTC-S. A VFR helicopter route also extends northwest to southeast over Sweetwater Marsh, entering the airspace above San Diego Bay just south of the National City Marine Terminal (Rollins 1998). As these flights occur fairly frequently and cross directly over SSTC at low altitudes, this provides animals the opportunity to become habituated to noise caused by aircraft in the ROI.

The effect of illumination and smoke are similarly difficult to quantify; however the possibility of these having a detrimental impact is even less than that of noise because of the use of pyrotechnics being concentrated on beaches or designated areas where terrestrial wildlife do not frequent, and because the area of effect is very small in relation to available habitat.

The differences between effects resulting from the No Action Alternative versus Alternative 1 are considered undetectable because of the difficulty in determining the sensitivity of wildlife to the noise, illumination, or smoke; because the activity will continue to take place in similar designated locations as under the No Action Alternative; and because much of the use is on beaches where there is little opportunity to interface with terrestrial wildlife. Finally, the majority of use is associated with a few activities such as Hell Week.

The increase in training under Alternative 1 that generates noise and that could interface with terrestrial wildlife would carry over under Alternative 2. While seemingly substantial from the numbers above, the activity carries a small footprint compared to available habitat, and occurs mostly in areas where terrestrial wildlife do not frequent. A portion of the activities could disperse to dune and beach areas under training lane management at SSTC-N if nesting thresholds are met for avian species, but this increase is considered negligible due to the low probability of affecting wildlife and for similar reasons described above for the difference between the No Action Alternative and Alternative 1.

Activities that contain boat or other aquatic maneuvers entirely offshore or below the high tide line are excluded from analysis of effects on terrestrial biological resources (Activities 1 - 3, 6 - 14, 20 - 23, 34, 40, 44, 49, 52, 54, 55, 57, 78, N1-N7, and N9, Tables 2-1 and 2-2); activities that include underwater detonation activities which lack an onshore component are included in these. The activities in which the training takes place entirely offshore sometimes still have onshore safety vehicles which observe from the beach. These safety vehicles are analyzed for their effect on terrestrial biological resources under Sections 3.11.2.2.2 and 3.11.2.3.2, Amphibious and Beach Activities. Some activities are almost exclusively indoors or in developed areas, such as Activity 31 (Table 2-1), Breacher Training which takes place at Bunker 98 in the interior of SSTC-S; Rappel and Fast Rope Training (Activity 36, Table 2-1) which takes place at the rappel tower north of the obstacle course on lane Yellow 1; and Communications (Activity 65, Table 2-1) which is classroom instruction. These activities take place in the vicinity of terrestrial biological resources but use already developed space, limiting their impact on resources in the area.

Solid waste, floating debris, and trash sometimes associated with human outdoor activities as well as that which washes or blows in from elsewhere, can modify conditions or increase the risk of ecosystem level changes associated with invasive species (National Invasive Species Council 2001). It is for this reason that Navy personnel training on SSTC work to clean solid waste from the beach after each activity, ensuring that this is not an issue affecting natural resources in the ROI.

### 3.11.2.1 Approach to Analysis

The actions pertinent to terrestrial resources are described in the following sections. The descriptions provide general information about how large a footprint on the beach or inland area each action normally requires. Also noted is the general location on the land where the activity takes place, which can determine how it could affect resources that are not evenly dispersed across the landscape.

The types of training activities that could affect terrestrial biological resources include those on the upper beach above the wrack line, the dunes, and vegetated and unvegetated inland areas. Disturbance of plants and wildlife or modification of their habitat from actions is evaluated based on the area the individual action encompasses and the value and type of habitat known to occur within the specific footprint. An effect is considered substantially adverse if the area of impact is substantial compared to habitat availability or scarcity, and whether the impacted resource has a special sensitivity status as recognized by resource agencies. An effect is also considered substantially adverse if the intensity, duration, or frequency of the action is such that the area cannot recolonize to former species abundance levels; the loss of habitat or habitat value (based on organism density or relative abundance) is considered permanent compared to baseline variation in these conditions.

Impacts to a federally listed species such as the San Diego fairy shrimp are analyzed in a Biological Assessment which has been submitted to the USFWS to initiate formal consultation under Section 7 of the ESA. Impacts to plants on the CNPS 1B list are analyzed at the end of each activity subsection if their location overlaps with that of the activity.

### 3.11.2.2 No Action Alternative

The No Action Alternative maintains the current level and types of training that currently occurs. Environmental management measures would remain unchanged. Current management practices for the beach lanes at SSTC-N and SSTC-S for the protection of the California least tern and western snowy plover results in ancillary benefits to other dune and beach dwelling species.

This section focuses on only groups of activities that have the potential to result in an impact to terrestrial biological resources. As discussed previously, similar types of actions are grouped together to facilitate analysis. These actions are marine vessels, amphibious and beach actions including vehicle use, fluid transfer actions, foot traffic, manual grading, and inland activities at SSTC-S.

#### 3.11.2.2.1 Marine Vessel Activities

Under the No Action Alternative, only one training activity (27, Craft Landing Zone, Table 2-1) includes Landing Craft Air Cushion (LCAC) vehicle use. Four Craft Landing Zone training events are conducted per year and occur on oceanside beach training areas within the SSTC-N and SSTC-S boat lanes and the Breakers Beach area of NASNI. An LCAC is a large, propeller-driven craft that uses fans to hover above land and water. Its footprint includes its physical structure plus the area surrounding it, which is affected by the strong winds it produces. An LCAC lands on the beach, approaching the sandy beach and dispersing sand in its path through wind and direct impact. Although sand can be blown for 10-20 yards at high velocity from around the bottom of the air cushion skirt, the safety zone for humans around an LCAC is a 50-yard radius.

The primary effects from LCACs are sand blowing and animals flushing from the area for a distance of about 20 yards from the LCAC landing. There is a possibility that beach and dune-dwelling terrestrial species could be directly crushed or blown by the LCAC; however, mobile animals can move out of the way and densities of buried organisms are low in the beach environment. The area of effect is low in relation to available habitat for the low abundance of mobile, terrestrial animals that could be on the beach. Severity of effects would depend on intervals between landings and whether they take place in the same location or are dispersed to different lanes, but these landings are dispersed in location and infrequent. Beach and dune LCAC training activities occur at a number of different sites within SSTC training areas, all on the SSTC-N ocean side, and only four training events are conducted annually, so effects would be short-term and dispersed over a large area. Nuttall’s lotus and coast woolly heads, (both CNPS 1B), are present in the dune areas at SSTC-N and SSTC-S and may experience wind from an LCAC; although these plants are not likely to sustain a direct impact or be buried from the LCAC activity because they grow in dunes or Upland Transition areas beyond the area of normal landing activity. Brand’s phacelia (Federal Candidate) is not known from the ocean side of SSTC-N.

Other beaching activities with vessels, such as Landing Craft, Utility (LCU)/Landing Craft Mechanized (LCM), could have similar effects to beach and dune-dwelling species as described for the LCAC. These vehicles would also be used throughout the SSTC training areas; however, they have a smaller footprint than LCAC activities, as they do not use fans to hover above the land and water. Therefore, effects are short-term and considered temporary and localized.

#### 3.11.2.2.2 Amphibious and Beach Activities

Amphibious activities include Elevated Causeway System (ELCAS) and Causeway Pier Insertion and Retraction. Beach actions include fluid transfer, vehicle use, foot traffic pyrotechnics and blanks, and manual excavations.

### Amphibious Activities

ELCAS and Causeway Pier Insertion and Retraction only take place during NTA 4.5.6 "Over the Shore Logistics." They involve the insertion of a floating causeway section onto the beach. Most of the sections remain floating offshore. During ELCAS, pilings are driven into the sediment and the causeway is elevated and secured onto them. The onshore area of these activities includes the footprint of the front end of the landing unit as well as additional areas that may be mechanically excavated for landing the causeway sections or to remove it off of the beach at the conclusion of the activity. ELCAS activities require grading of the beach area, whereas floating causeway pier insertion requires excavation of the landing area. Construction of elevated causeways requires an initial grading of sand and then pile driving and anchoring. Noise from the pile driving can be disruptive to nearby residential and training sites, and typically 10 days per training event. Causeway activities occur primarily on SSTC-N oceanside boat and beach lanes, but also periodically in the Bravo bayside training area. Causeway activities occur during three separate training activities: Causeway Pier Insertion and Retraction, Elevated Causeway System, and Maritime Prepositioning Ships (MPS) Offload (Activities 41, 42, and 49, respectively, Table 2-1) annually under the No Action Alternative for a total of 12 training events.

Causeway activities, such as the MPS Offload, sometimes involve excavation on the beach in a footprint about as wide as the causeway. The footprint of beach wrack that could be affected is on the order of 20 to 50 feet, mostly a result of support vehicle use associated with the excavation. Dragging of boats, such as during Combat Rubber Raiding Craft actions (unrelated to causeway activities), may also disturb beach wrack, as well as the landing of LCU/LCMs at high tide. The environment of the upper beach is already disturbed and naturally low in species number due to the coarse-grained, desiccated substrate. Since vegetation abundance is low (including a lack of sensitive plants), the likelihood of foraging animals, including endemic spiders and beetles, is also low. Mammals in this area could be disturbed by the presence of vehicles, personnel, and equipment. Pile driving noise is unlikely to affect terrestrial wildlife due to the distance from areas of wildlife concentrations and habituation of wildlife to the baseline noise environment. Most of the effect, if any, would be to isolated patches of beach wrack or vegetation. Therefore, effects are considered to be short-term and minor, with most wrack replaced by the next high tide.

For ELCAS and floating causeway insertion activities that could reach the upper beach, beach vegetation and invertebrates may be crushed or the substrate compacted. In the Bravo Beach areas where ELCAS actions and beach grading is infrequent but recurring (about twice per year), compaction caused by amphibious vehicles that could reach the upland transition area above the high tide line could result in habitat alteration such that special status plants such as Brand's phacelia and coast woolly heads could not repopulate the area in a single season. This sand-dominated beach provides little opportunity for organisms to become established permanently because the substrate is naturally unstable and the beach environment stressful to both plants and burrowing animals due to extreme desiccation and salinity gradients. However, the habitat at the upland portions of the training lanes could be impacted if heavy equipment, repeated vehicle use, or excavation occurs there.

### Beach Activities

The following analyzes potential effects associated with training activities that have a beach training component as part of the overall training activity. Activities analyzed below take place entirely out of the water on the training beaches, on the hard pack sand between the high and low tide line if the tide is out. Potential effects related associated with marine plants and invertebrates are analyzed in Section 3.7, Marine Biological Resources.

### *Fluid Transfer*

Fluid transfer training events are conducted as part of Offshore Petroleum Discharge System, Amphibious Bulk Liquid Transfer System and Reverse Osmosis Water Purification Unit (Activities 38, 39, and 50, respectively, Table 2-1) training. A detailed description of these activities is provided in Section 2. Components of these activities are addressed as they relate to potential impacts out of the water and on the beach. Equipment associated with fluid transfer do not typically extend into the vegetated dune area, and even if they did, special status species would not be substantially affected because they are resistant to limited trampling. Plants, such as Nuttall's lotus are locally common, having a nearby source population should a limited area get damaged. These activities are conducted in concentrated areas near the shoreline; therefore, effects to beach and dune dwelling special status plants and wildlife would be short term due to the amount of dune area available for recolonization and the localized nature of these activities.

### *Vehicle Use*

Vehicle use under the No Action Alternative consists of safety and logistical vehicles, bulldozers, four-wheel-drive vehicle training, vehicles and equipment supporting beach party operations, equipment offload and staging vehicles, and amphibious vehicles on the shore (Activities 4, 5, 6, 7, 11, 14, 15, 17, 18, 19-23, 25-31, 35-43, 45-52, 54-77, Table 2-1). Bulldozers are used to grade the beach, excavate sand, recreate hummocks, and push beached vessels that are stuck back into the water. They are used in 12 training activities in the ROI (Activities 25, 38, 39, 41-43, 45, 46, 48, 49, 51, 52, Table 2-1). Between one and two bulldozers are used for each activity for a total of 198 training events under the No Action Alternative. Cranes are used to move equipment and boxes around. During equipment offloading, all types of equipment including Lighter, Amphibious, Resupply, Cargo-5 ton (LARC-V) can be offloaded, set up, and operated on the beach. Beach party operations may use vehicles to patrol, deliver equipment, and dig ravines or trenches using backhoes or bulldozers. Vehicle use is common to most of the exercises that occur on SSTC; even activities that do not otherwise access the shore require monitoring by on-shore vehicles for safety and logistical reasons.

On the beach, vehicles typically travel at low speeds or are stationary. Bulldozer, vehicle use, and other activities in the dunes could impact dune dwelling special status species such as Nuttall's lotus and coast woolly-heads. The proportion of time these vehicles and equipment are in the dunes versus on the lower dry sand is low, but not quantifiable. Effects could include habitat alteration associated with compaction of vegetated habitat and repeat crushing of plants or burrows. Vehicle patrol activities can have substantial impacts to the dune area but are limited to Yellow and Green training lanes under the No Action Alternative, leaving adjacent occupied suitable habitat free from impact. In the Bravo training areas on the bay shore, heavy equipment use that reaches the upland transition areas could impact the Federal Candidate species, Brand's phacelia. It would mostly likely be individuals that were impacted in years when the plant is present, since the most substantial populations are adjacent to housing areas where training activity is not expected to be intense. Current protective measures for invasive plant removal may partially mitigate for habitat loss and crushing of individual plants in the dunes and upland transition areas, because such measures can enhance habitat conditions for these species.

### *Foot Traffic*

Foot traffic is associated with MCM beaching operations, beach camps, patrolling in small groups, beach crossing, observation posts, parachutists, and visual observation activities. SSTC training activities could generate an estimated 1,390,000 person-hours of foot travel on SSTC training lands. Most of this activity would occur on SSTC-S Inland. Of the activities listed above, only Hell Week activities could occur on Breakers Beach at NASNI. Foot traffic associated with training activities (Activities 4, 5, 16, 17, 18, 19, 20, 22-53, 56-69, and 71-77, Table 2-1) could result in crushing of vegetation and plants or animals, soil erosion or sedimentation, and degrading habitat values by introducing invasive species. While foot traffic under the No Action Alternative is very frequent, most is widely dispersed and in small groups; therefore, effects are negligible to minor and localized. Concentrated foot traffic, such as that associated with beach camps, running and marching, especially within the dunes, may impact special status plants and animals such as Nuttall's lotus and coast woolly-heads. Parachutists that land in or near the Kaufman Drop Zone are unlikely to impact vernal pools due to their high skill level and the restriction of activities to the southern portion of the drop zone. Given that the No Action Alternative restricts training access to SSTC-N beaches Blue 2 through Orange 2 during the least tern and snowy plover nesting season, effects to beach and dune dwelling special status species are avoided during this time of year in those areas. In general, training personnel on foot tend to avoid areas of dense vegetation because of the difficulty in negotiating around those areas; therefore, effects from foot traffic are negligible to minor, and any effects would be expected to be short term (recoverable).

While training on beaches at SSTC-S during physical training runs (Activity 68, Table 2-1), trainees may have a military working dog participating in the physical conditioning. Dogs are trained along SSTC-N as well as SSTC-S. While they are typically on the hard packed sand (SSTC-S) or sand road (SSTC-N), they can also be on the soft packed sand in both areas. The dogs are trained to not relieve themselves while training, but the excrement would be picked up after training if it were to occur.

The overall effect of foot and dog traffic under the No Action Alternative on non-avian biological resources is expected to be short-term and minor due to avoidance of certain sensitive areas for several months of the year, the naturally disturbed beach environment where the most concentrated foot traffic occurs and where terrestrial resources are sparse, the dispersed nature of most of the on-foot activity, and the location of special status and other native plants in naturally disturbed habitats (locations in Figures 3.11-5 through 3.11-7). Effects on non-avian terrestrial wildlife would include harassment such as accidental flushing of small mammals even though the dogs are trained not to pursue wildlife. Exposure to harassment is partly avoided due to the availability of escape cover such as vegetation or burrows. Long-term impacts are avoided because the majority of foot traffic is not repeated in the same location and soil compaction is unlikely, allowing individual species to recover in a season or less. Dune plants such as lotus and coast woolly-heads are accustomed to the frequently disturbed dune environment and, as long as soil compaction is not an issue, can withstand the level of foot traffic anticipated under the No Action Alternative. Foot traffic could impact Brand's phacelia in the Bravo training areas. This effect is considered minor and short term.

### *Manual Excavations*

Manual excavations are conducted in about 18 events under the No Action Alternative. Most of the time these activities could be conducted on the SSTC-N oceanside beaches, but they could also be conducted at other areas in the training complex. Excavations consist of individuals digging trenches, burying and excavating items from the ground, and concealing beached boats. During training activities, individuals will bury items near the high tide line of the beach. The approximate area disturbed is about 10 x 10 yards. While vernal pool areas are avoided in the inland areas of SSTC-S, some manual excavations could take place roadside in that area.

These effects are considered negligible on the beaches and potentially minor at SSTC-S, and temporary because of the size of the area being disturbed in relation to adjacent habitat, and because these activities occur in a naturally disturbed environment (consistent wave action and below the high tide line). Manual excavations on the beach are usually conducted away from vegetated beach wrack, near the high tide line where the natural beach slope makes excavation easier. A different footprint for manual excavation could be used each time. This area is low in numbers of terrestrial plants or animals. Roadside areas of SSTC-S contain individuals of Nuttall's lotus, and these plants could be killed by digging or burial. Due to soil disturbance, this activity could displace this native special status plant in a localized area, but available habitat is large compared to the area of the manual excavations, even when they are not repeated in the same location, comprising less than one percent of the beach or roadside area.

#### 3.11.2.2.3 Inland Activities

Inland activities are those that occur on the interior portion of SSTC-S (Activities 4, 16, 25, 26, 28-31, 35, 58-66, 69, 71-74, Table 2-1). This includes foot and vehicle traffic on paved and unpaved roads, manual excavations, and parachutists using the southern portion of the Kaufman Drop Zone. Manual excavations on SSTC-S inland areas are conducted roadside, but outside the area with vernal pools. Restrictions on manual excavations are in place at the archeological site on the eastern boundary of SSTC-S inland (discussed further in Section 3.13, Cultural Resources). Individuals on foot may utilize the semi-developed areas or buildings in the inland area or traverse off-road for stalking or other on-foot activities. Under the No Action Alternative, training is not permitted in vernal pools.

This restriction also applies to parachutists using the SSTC-S Kaufman Drop Zone. This drop zone is located in the same area as vernal pools which were not occupied by the San Diego fairy shrimp during past surveys, but overlaps Pool 10 which is occupied, and Pool 8 which did not pond the years surveys were conducted, so occupation by San Diego fairy shrimp is unknown (Figure 3.11-8). The northern portion of the drop zone is not used for training activities and landing targets for the parachutists will be placed well away from the vernal pools, and foot traffic associated with personnel egress would not be permitted in the vernal pools.

Military dog training also takes place in the inland area of SSTC-S during Close Quarters Combat / Close Quarters Defense (Activity 64, Table 2-1). These dogs are in the final stages of their training and are practicing the location of people hiding, such as in buildings or bunkers. As this is primarily training for an urban environment it takes place mostly inside the disturbed northern area of SSTC-S. The dogs (one dog trains at a time) are off-leash during the exercise but under strict verbal and visual control. They are trained not to pursue wildlife and to only bark when they have located their target object. They are also trained not to relieve themselves while training, but would be picked up after were this to occur. Exercise of the dogs, separate from training, can also take place on the beaches of SSTC-N and SSTC-S.

Foot traffic at SSTC-S could result in effects to soils, vegetation, and special status species by crushing cysts, trampling soils, trailing, introducing invasive species, and generally degrading habitat of sensitive species. The effect could be short-term or long-term depending on how foot traffic is dispersed and if it is repeated in the same location. The federally endangered San Diego fairy shrimp could be impacted both directly and indirectly by foot traffic in the pools. The mechanisms include crushing of cysts, translocation of cysts to unsuitable locations and potential changes in vernal pool topography, hydrology and water quality (associated with soil compaction, infestation by invasive exotic plant species, or reduction in vegetation cover) that could affect the ability of pools to support San Diego fairy shrimp. While the latter is reduced through proposed management and conservation measures, the potential effect remains.

The Navy will continue to prohibit driving of vehicles off of established roads at SSTC-S Inland, year round. Only emergency or security vehicles will infrequently be driven on unpaved roads. Although vehicle use of unpaved roads in vernal pool areas is limited to emergency vehicles in emergency situations, which are likely to be quite rare, impacts of such use on the San Diego fairy shrimp could occur through similar mechanisms as described for foot traffic above. The cysts may occupy road pools and be crushed or translocated by wheeled vehicles to areas where they cannot survive. Vehicles can introduce invasive weeds, and alter pool hydrology through compaction and recontouring of the road surface, or change water quality through sedimentation, especially when roads are wet. With access restrictions, management and conservation measures, foot and vehicle traffic may affect, but are not likely to adversely affect, San Diego fairy shrimp.

Variegated dudleya is a CNPS list 1B species occurring in the upland areas around vernal pools in the inland area of SSTC-S. This plant can be sensitive to soil compaction that results from trampling if trampling occurs continually in the same location, forming trails. Since operators are restricted from vernal pool areas under the No Action Alternative their impact to dudleya will be somewhat avoided. Individual plants may at times be crushed, but the health of the population is not expected to decline. As the military dogs training at SSTC-S are in their final stages of training and may not pursue or harass wildlife in the inland area, they still may accidentally flush or disturb wildlife, which could be detrimental to their reproductive potential through energy expenditure. The effect is considered short-term and minor is not expected to have an intense, sustained, or permanent impact.

Nuttall’s lotus, also a CNPS list 1B species, is more widespread in the ROI. It is also less sensitive to disturbance than the variegated dudleya. Because this plant is more widespread and less sensitive to disturbance it is not anticipated that effects from training will result in a decline of this rare, but locally common plant. In summary, even though individual plants may be crushed and killed it is not anticipated that this impact will result in a permanent decline in general abundance levels of these species from the ROI.

### 3.11.2.3 Alternative 1 (Preferred Alternative)

Under Alternative 1, the baseline level of training would increase. In addition, current management of terrestrial biological resources would change to allow foot traffic associated with training activities in vernal pools when conditions are dry and provide for additional management and monitoring of San Diego fairy shrimp. In addition, Alternative 1 would include changes in lane access restrictions to allow training in lanes currently restricted during the western snowy plover and California least tern nesting season. The result would be increased dispersal of training activities with respect to terrestrial biological resources such as in the upper beach, dune, and inland areas.

This section focuses on groups of activities that have the potential to result in an impact to terrestrial biological resources. As discussed previously, similar types of actions are grouped together to facilitate the analysis.

#### 3.11.2.3.1 Marine Vessel Activities

Implementation of Alternative 1 would result in similar effects to terrestrial biological resources from LCAC landings as previously described under the No Action Alternative since no additional landings are proposed.

#### 3.11.2.3.2 Amphibious and Beach Actions

Amphibious and Beach actions increase by varying degrees under Alternative 1; these differences are detailed below.

#### Amphibious Actions

Under Alternative 1, ELCAS and causeway insertion and retraction activities would increase from 12 to 16 training events. However, effects to terrestrial biological resources would be similar to those described under the No Action Alternative because these activities take place mostly in the SSTC-N Boat and Beach Lanes 1-10, in areas largely devoid of terrestrial flora and fauna. The events that take place in the Bravo Beach training lane on the bay side have the potential to affect special status plants of the upland transition area, but these more inland portions of the lanes are largely not used by this activity, but could be affected by ancillary support vehicles or foot traffic. The additional events are inconsequential over the No Action Alternative.

### Beach Actions

#### *Fluid Transfer*

Fluid transfer activities (Activities 38, 39, and 50, Table 2-1) would increase by one event annually to 15 events per year under Alternative 1. Implementation of Alternative 1 would result in similar effects to terrestrial biological resources as previously described under the No Action Alternative.

#### *Vehicle Use*

As presented in Chapter 2 (Table 2-1 and 2-2) and detailed in Appendix C, in addition to an increase in safety and logistical vehicle use, vehicle patrolling would be increased under Alternative 1. These activities would involve personnel driving vehicles along the hard pack and soft pack sand, maneuvering on the beach in directions determined by the trainees so that they can learn to drive and operate the vehicles in varying terrain. Activities would be limited to SSTC-N beach lanes Yellow 1 and 2 and Green 1 and 2 because of the large potential impact to sensitive resources over the course of multiple patrolling exercises. These activities are conservatively estimated to impact about half of the available beach lanes over the course of a year. Due to the restriction of these activities to Yellow and Green lanes, effects would be the same as those described under the No Action Alternative.

Operation of vehicles could potentially include driving over vegetation in the dunes or beach lanes, including special status species or their burrows. Since Nuttall's lotus and coast woolly-heads are annuals, some crushing would be avoided during the dry season, or over the course of an entire year in a drought year. Repeated driving over similar areas could compact the substrate and result in permanent habitat alteration such that the site would not recolonize, however driving activities typically occur in non-vegetated or minimally-vegetated areas. The tiger beetle and globose dune beetle could be affected in the dunes at SSTC-S, since some of the vehicle patrolling and testing is expected to take place at SSTC-S and SSTC-S inland area. The area affected is not known because the proportion of time spent in the dunes versus upper beach is not known, and vehicle use is dispersed across beach training lanes.

Effects from vehicle use such as equipment offloading and bulldozer activities would increase; however, effects would be the same as those described under the No Action Alternative. Equipment offloading and bulldozer use in vegetated areas could crush individuals or habitats of sensitive species.

#### *Foot Traffic*

Under Alternative 1, foot traffic would increase as a result in an overall increase in training activities; however, effects would be the same as those described under the No Action Alternative. The overall effect of foot traffic under Alternative 1 on non-avian biological resources is expected to be short-term and of moderate intensity due to the potential overlap of concentrated activities in the dunes and upper beach areas, and foot traffic at SSTC-S in the vicinity of vernal pools when they are determined to be dry. However, such concentrated activities are avoided as activities are not repeated in the same location and soil compaction is unlikely. This allows for recovery of individual species in a season or less. Parachutists that land in or near the Kaufman Drop Zone may accidentally impact nearby vernal pools, but this is unlikely since parachutists are trained to only utilize the southern portion of the drop zone, away from vernal pools.

*Manual Excavations*

Under Alternative 1, manual excavations would increase from 18 to about 52 events. If all excavations were 10 x 10 yards and there was no overlap in location, about 80 square yards of material would be excavated and replaced over the course of a year. Greater effects on inhabitants of the beach-dune complex of SSTC-N could take place with the increase in manual excavation combined with the possibility of increased access to beach training areas during the breeding season. While the footprint is small, localized, and in a naturally disturbed environment, the presence of personnel and excavations could result in disturbances to mammals on the beach, and in the dunes where special status plants and wildlife live. Excavation activities could result in habitat modification for dune and upper beach dwellers, and similarly for areas along roads (outside of the vernal pool area) in inland SSTC-S.

### 3.11.2.3.3 Inland Activities

Under Alternative 1, changes to training area access restrictions would allow foot traffic in the vernal pools when conditions are dry. Most of the training operators at SSTC-S do not have a requirement to enter into areas with vernal pools. However, a few activities, particularly those that require open maneuver space, consider these areas important and valuable for training. The southern half of SSTC-S contains open, flat space with low-growing ground vegetation, ideal for open space maneuvers. This space is valuable because it is an open, undeveloped, natural area adjacent to buildings, bunkers, road networks and other man-made structures on the northern half of SSTC-S that are used as target or focal points for military training. Its lack of artificial man-made structures makes it an important, albeit not often needed, complement to the training that occurs on the northern half of SSTC-S. For example, during an exercise, heavy focus of the military exercise may be focused on landing on the beach, crossing to the inland area, and targeting the structures on the northern half of SSTC-S, but individuals may need to be sent for reconnaissance missions surrounding the structures to the southern, undeveloped portions of SSTC-S. Having avoidance areas where open maneuvering is needed adversely impacts the realism and quality of training. In addition, these areas may be needed if other areas are scheduled and no other training areas are available or different areas are needed for training diversity. The vernal pools are anticipated to be dry 50 to 95 percent of the year. The vernal pool monitoring and management plan will outline the qualifications necessary for personnel that determine if all pools in a given unit are dry, as well as the methodology for determining that the pools are dry, which could be at intermittent times throughout the rainy season rather than during a defined dry period. As such, it is conservatively anticipated that training activities in the vernal pool area would be conducted about five percent of the time. This estimate is due to the pools' location away from the road network and buildings and bunkers.

If an activity such as stalking or reconnaissance foot traffic requires access to the vernal pool areas, it is conservatively estimated that 10 percent of the people conducting the training activity would enter into the vernal pools as each training activity is dispersed across the vernal pool area. This translates into approximately 12 to 207 people potentially entering into the vernal pools each year, of which almost all would be on foot. This includes parachutists who may traverse the vernal pool area on foot after landing nearby. Parachuting involves about 216 events under the No Action Alternative, and only slightly more (up to 228) under Alternatives 1 and 2, most of which occur over water rather than the Kaufman Drop Zone. Parachutists would not enter the vernal pool area unless the pools are dry. It is estimated that less than two percent of the people would be on their bellies stalking. The intensity and duration of the actual traffic depends on the dispersion of the action across the training area, and how much is repeated in the same location, such as in activities when one person follows another in a group.

Since off-road vehicle traffic, manual excavations, and similar actions are prohibited in vernal pools under the proposed management, these actions would not have an adverse effect on the fairy shrimp. Under Alternative 1, the vernal pools are avoided when conditions are wet. Foot training is scheduled in vernal pools only during dry conditions. This is the time when the shrimp are least vulnerable because they are encased in hard cysts at or near the soil surface (dry season sampling protocol entails collection of the top 3 cm of soil) awaiting the return of wet conditions; however, some crushing of cysts is expected, or translocation to areas where the fairy shrimp will not survive. Also, the soils in the vernal pool and pool watershed that support pool hydrology are less easily disturbed when dry (they are less compactable and less displaceable). Also, in order to ensure that vernal pool management is based on current species presence or absence, regular surveys will be conducted to determine the status of San Diego fairy shrimp in the SSTC-S inland. These surveys will examine shrimp presence, especially in regard to periodic flooding in El Niño years, and the resulting possible changes in pool condition and species distribution. Finally, effects are minimized through the Navy's invasive plant species control program. While harm to cysts is expected, compared to an estimated population of tens of thousands if not millions of cysts in these pools, the relative impact to a large percentage of cysts is minimal.

As a result of the completed USFWS consultation (Biological Opinion FWS-SDG-08B0503-09F0517, July 7, 2010), the Navy will be submitting a Vernal Pool Monitoring and Management Plan in order to help identify whether the impacts identified in this EIS remain at the low levels expected. The Plan will include focused invasive plant inspection in the pools and their watersheds; plant, topographic, hydrological, and water quality surveys (including salinity); and protocol fairy shrimp surveys. The Navy will be establishing the baseline distribution and abundance of San Diego fairy shrimp and condition of the vernal pool habitat prior to initiating training activities in or around the vernal pools at SSTC-S Inland. The Navy will report monitoring results and any observed incidental take to the USFWS annually, and will adjust management to the vernal pools occupied by San Diego fairy shrimp to minimize any training impacts detected by monitoring. If impacts are more than the low levels anticipated or impacts could lead to the extirpation of fairy shrimp from any individual pool, then the Navy will reinitiate consultation with the USFWS. Finally, the Navy will mark with flexi-stakes a subset of the pools, Pools 1-7, for avoidance year round.

While the management measures described will help alleviate the potential impacts to pools, effects remain to soils, vegetation, and special status species by crushing of cysts, trampling soils, trailing, introducing invasive species, and degrading habitat. The effect could be short-term or long-term depending on how foot traffic is dispersed and if it is repeated in the same location. The federally endangered San Diego fairy shrimp could be impacted both directly and indirectly by foot traffic in the pools. The mechanisms include crushing cysts, translocation of cysts to unsuitable locations and potential changes in vernal pool topography, hydrology and water quality (associated with soil compaction, infestation by invasive exotic plant species, or reduction in vegetation cover) that could affect the ability of pools to support San Diego fairy shrimp.

Although vehicle use of unpaved roads in vernal pool areas is limited to emergency vehicles in emergency situations, which are likely to be quite rare, impacts of such use on the San Diego fairy shrimp could occur through similar mechanisms as described for foot traffic above. The cysts may occupy road pools and be translocated by wheeled vehicles. Vehicles can introduce invasive weeds, and alter pool hydrology through compaction and recontouring of the road surface, or change water quality through sedimentation, especially when roads are wet.

Foot traffic experienced in the vernal pools would likely be similar to that experienced by Nuttall's lotus and variegated dudleya since these plants grow in the upland area adjacent to the pools. This level of traffic would likely be greater than that experienced under the No Action Alternative, resulting in the potential crushing of individual plants. Since the foot traffic consists primarily of small groups, trail forming and soil compaction is unlikely, resulting in no impact to population viability. With access restrictions, management and conservation measures, foot and vehicle traffic may affect, not likely to adversely affect, San Diego fairy shrimp.

As presented in Section 3.6.2.3.3, breacher training activities at the CQC/CQD and breacher façade would produce noise levels that could temporarily affect animal hearing. Expected received peak impulse levels may be sufficient to alter mammal behavior, as it is a stimulus of fast onset and short duration. Although sustained exposure to continuous noise at the high levels produced by these activities could be damaging, the noise from detonations is momentary; this exposure would not be expected to cause any physiological damage or hearing loss to mammals. In between impacts, noise levels would resume to typical background levels (the high ambient surf noise levels are estimated to be 63 to 69 dBA Leq). Therefore, no long-term habitat degradation in the area is anticipated.

Although sustained exposure to continuous noise at or exceeding levels produced by these activities could be damaging, the noise from these training activities is momentary; this exposure would not be expected to cause any physiological damage or hearing loss to mammals. This is, in part, because native animals, including special status wildlife, are not abundant in the area where this activity takes place, which is dominated by iceplant.

### 3.11.2.4 Alternative 2

Implementation of Alternative 2 would increase the training tempo to the same levels as those proposed for Alternative 1. The only difference between Alternative 1 and 2 is that, under Alternative 2, all SSTC-N oceanside beach training areas would be available for Navy training, regardless of time of year. Therefore, the impacts associated with Alternative 2 would be the same as those described above for Alternative 1, though dispersed across a larger area due to reduced training area restrictions. CNPS special status plants growing on the ROIs sandy beaches, Nuttall’s lotus, coast woolly-heads, and Brand’s phacelia could experience impacts across a wider segment of their population in the ROI, but less intense impacts than under Alternative 1.

## 3.11.3 Proposed Mitigation Measures

Current mitigation measures will be continued. Proposed mitigation measures for terrestrial biological resources under the Alternatives are summarized below.

Current natural resource protection measures would continue, such as those derived through Navy Instructions, ecosystem-based planning in the INRMPs, and the employment of best management practices and standard operating procedures to avoid and minimize environmental impacts. Existing measures include invasive species control, erosion control, inventory, monitoring, and habitat enhancement.

For the San Diego fairy shrimp, under the Proposed Action and as described in the July 2010 Biological Opinion from USFWS, the Navy will avoid vernal pools occupied by San Diego fairy shrimp and their watersheds when designating parachute drop zones in SSTC-S Inland. Vernal pools will be identified to assure that drop zones are located at least 30 m (100 ft) from each occupied pool. While the Kaufmann drop zone has previously been established, the Navy restricts its activities to the southern portion of the drop zone, away from populated vernal pools. The Navy will consider the location of vernal pools occupied by San Diego fairy shrimp and their watersheds when planning training involving off-road foot traffic at SSTC-S Inland. To the maximum extent consistent with training need, off-road foot traffic will avoid the occupied vernal pools and their watersheds. The Navy will avoid the occupied vernal pools and their watersheds adjacent to the road at SSTC-S Inland (i.e., pools 1 through 7 marked with flexi-stakes) year round to the maximum extent consistent with training need. Avoidance may be accomplished using markers, maps, GPS coordinates or any other means consistent with training needs. Training would not be allowed in the remaining vernal pools when conditions are wet. Foot traffic would be permitted in the pools when conditions are dry. The pools will be analyzed in groups to determine whether they are dry, so it is possible that a subset of pools could be opened for training opportunities, while another subset remain closed to training. The Navy will be submitting a draft Vernal Pool Monitoring and Management Plan to the USFWS and the California Coastal Commission in order to help identify whether the impacts identified in this EIS remain at the low levels expected. The Plan will include focused invasive plant survey in the pools and their watersheds; plant, topographic, hydrological, and water quality surveys (including salinity); and protocol fairy shrimp surveys. The Vernal Pool Monitoring and Management Plan will list: 1) what criteria are used to determine that the pools are dry, and 2) who makes the "dry" determination, i.e., the qualifications of the person responsible for determining wet and dry conditions. This plan will identify measures to minimize the potential for adverse effects to fairy shrimp from weed abatement, pool restoration, or pool augmentation. The Navy will be establishing the baseline distribution and abundance of San Diego fairy shrimp and condition of the vernal pool habitat prior to initiating training activities in or around the vernal pools at SSTC-S Inland. The Navy will report monitoring results and any observed incidental take to the USFWS and the California Coastal Commission annually, and will adjust management to the vernal pools occupied by San Diego fairy shrimp to minimize any training impacts detected by monitoring. If impacts are more than the low levels anticipated or impacts could lead to the extirpation of fairy shrimp from any individual pool, then the Navy will reinitiate consultation with the USFWS.

Under the No Action Alternative and Alternative 1, Vehicle Patrolling and LARC V Operator Training are limited to training lanes Yellow 1 and 2 and Green 1 and 2, and will not occur in Red, Blue, or Orange Beach Lanes. Training activity restrictions serve to minimize effects to terrestrial biological resources in these lanes. This mitigation measure only occurs under the No Action Alternative and Alternative 1.

Coincidental benefit to special status plants would occur through measures that are designed that may be implemented to support nesting by the California least tern and western snowy plover. For instance, the Long-term Site Enhancement Plan for the tern would benefit terrestrial plants and wildlife. In this scenario, the dunes on the windward (west) edges of Delta North and South would be enhanced for plovers, the least tern nesting area would be enhanced with sand, which also benefits special status plants.

### 3.11.4 Unavoidable Environmental Effects

It is expected that increases in foot traffic at SSTC-S could result in effects to the San Diego fairy shrimp, even with implementation of mitigation measures. An estimate of the increase in foot traffic could be in the range of 12 to 207 people entering into the vernal pools each year. There could also be impacts to individual CNPS special status plants under all of the alternatives. For example, variegated dudleya is more sensitive to trampling and compaction than other CNPS plants; and it may suffer increased impacts over species like Nuttall's lotus and coast woolly-heads, which thrive in disturbance prone dune-like environments. Diffuse off road foot traffic in SSTC-S interior areas may result in a decreased number of dudleya plants, but not in extirpation of the plant from the area. Coast woolly-heads and Nuttall's lotus are more widespread in the ROI and are quite common to the local area; the plants are also less sensitive to disturbance; though, Nuttall's lotus can be sensitive to compaction. Because these plants are more widespread and less sensitive to disturbance, it is not anticipated that effects from training will result in a decline of these rare, but common plants. In summary, even though individual plants may be crushed and killed, it is not anticipated that this impact will result in extirpation of any of these species from the ROI.

Various training activities could affect Brand's phacelia in the Bravo training area. Effects are minimized by the ephemeral nature of this plant, and its tolerance of disturbed conditions. However, the possibility remains of crushing and soil compaction by vehicles, equipment, and foot traffic that alter the site's ability to support this plant.

No other unavoidable environmental effects have been identified.

### 3.11.5 Summary of Effects

There is a possibility of effects on the San Diego fairy shrimp, federally listed as an endangered species, due to the expected increase in foot traffic at SSTC-S. Foot traffic in vernal pool areas would only occur when the vernal pools are dry, which is during the dormant cyst stage of the fairy shrimp and a period least likely to impact the species. However, with mitigation measures presented above, the USFWS signed a Biological Opinion concluding that the Proposed Action would not jeopardize the continued existence of the San Diego fairy shrimp.

There is also an expected increase in effects to vegetation and species of the beach-dune complex, including beetles and special status spiders, because of increased training tempo and access to training lanes during times of the year when these areas were formerly restricted. The primary activities that increase in this environment are vehicle and foot traffic. Effects on Brand’s phacelia due to various training activities are also a possibility.

At SSTC-S, there is an expected effect on scrub and dune vegetation, special status plants, and mammals that reside in the area due to an increase in foot traffic of about 40 percent over current levels, possible manual excavations along roads, and other activities including helicopter insertions and extractions. Increased human presence degrades habitat values in this manner. Foot traffic can also create impacts through direct trampling, trailing, and sedimentation. A summary of effects by alternative is presented in Table 3.11-3.

**Table 3.11-3: Summary of Effects**

| Alternative | Effects |
|---|---|
| **No Action Alternative** | • Effects to San Diego Fairy Shrimp would be negligible. With access restrictions, management and conservation measures, training activities may affect, but are not likely to adversely affect, ESA-listed San Diego fairy shrimp.<br>• Potential impacts to federal and state protected plants and invertebrates and CNPS special status plants from air and marine vessel activities are expected to be minimal, as activities occur in the air and below the high tide line. Foot and vehicle traffic may have the greatest effect on terrestrial biological resources; though effects are expected to be temporary and cease at the termination of an activity.<br>• Effects on wildlife would be limited to temporary disturbance under this alternative. |
| **Alternative 1** | • Foot traffic in vernal pool areas could adversely impact individual fairy shrimp. However, impacts would be minimized, due to the low levels of foot traffic that would occur in the pools, exclusion of certain pools from any access at any time to training, and the limitation of activities in training-accessible to when those vernal pools are dry. Potential impacts to the San Diego fairy shrimp are also associated with emergency vehicle use in emergency situations in the vernal pool area. With access restrictions, management and conservation measures, training activities may affect, but are not likely to adversely affect, San Diego fairy shrimp. The USFWS signed a Biological Opinion concluding that the Proposed Action would not jeopardize the continued existence of the San Diego fairy shrimp.<br>• Potential increased training on SSTC-N beach lanes Blue 2, Orange 1 and Orange 2 could increase impacts to special status plants and invertebrates in these areas while decreasing impacts at other locations. Some trampling of vegetation at these locations is expected, though the overall effect on non-avian biological resources is expected to be short term and of moderate intensity due to the potential overlap of concentrated activities in the dunes and upper beach areas. These activities do not pose long-term impacts, effects are expected to be temporary and cease at the termination of an activity.<br>• Increased foot traffic could cause behavioral impacts to surrounding wildlife, though this effect is expected to be temporary.<br>• Various activities have the potential to impact Brand's phacelia within the Bravo training area. |
| **Alternative 2** | • Effects of Alternative 2 would be different from those under Alternative 1 because of the increased access to SSTC-N oceanside training lanes. Activity levels would not increase, so effects from those activities which access the SSTC-N lanes would be spread more widely across the ROI. Plants and animals in the unrestricted training lanes could be more affected due to the increase in frequency of use, whereas plants and animals in other lanes could be less affected due to reduced usage. |

**Table 3.11-3: Summary of Effects (Continued)**

| Alternative | Effects |
|---|---|
| **Mitigation Measures** | • Under the No Action Alternative and Alternative 1, Vehicle Patrolling and LARC V Operator Training are limited to training lanes Yellow 1 and 2 and Green 1 and 2, and will not occur in Red, Blue, or Orange Beach Lanes.<br>• For the San Diego fairy shrimp, under the Proposed Action, the Navy will avoid vernal pools occupied by San Diego fairy shrimp and their watersheds when designating parachute drop zones in SSTC-S Inland. Vernal pools will be identified to assure that drop zones are located at least 30 m (100 ft) from each occupied pool. The Navy will restrict parachutists to the southern portion of the established Kaufman drop zone.<br>• The Navy will consider the location of vernal pools occupied by San Diego fairy shrimp and their watersheds when planning training involving off-road foot traffic at SSTC-S Inland. To the maximum extent consistent with training need, off-road foot traffic will avoid the occupied vernal pools and their watersheds. The Navy will avoid the occupied vernal pools and their watersheds adjacent to the road at SSTC-S Inland (i.e., pools 1 through 7 marked with flexi-stakes) year round to the maximum extent consistent with training need. Avoidance may be accomplished using markers, maps, GPS coordinates or any other means consistent with training needs. Training would not be allowed in the remaining vernal pools when conditions are wet. Foot traffic would be permitted in the pools when conditions are dry.<br>• The Navy will be completing and submitting a draft Vernal Pool Monitoring and Management Plan to the USFWS and the California Coastal Commission in order to help identify whether the impacts identified in this EIS remain at the low levels expected. The Plan will include focused invasive plant survey in the pools and their watersheds; plant, topographic, hydrological, and water quality surveys (including salinity); and protocol fairy shrimp surveys. The Vernal Pool Monitoring and Management Plan will list: 1) what criteria are used to determine that the pools are dry, and 2) who makes the “dry” determination, i.e., the qualifications of the person responsible for determining wet and dry conditions. The Plan will identify measures to minimize the potential for adverse effects to fairy shrimp from weed abatement, pool restoration, or pool augmentation. The Navy will be establishing the baseline distribution and abundance of San Diego fairy shrimp and condition of the vernal pool habitat prior to initiating training activities in or around the vernal pools at SSTC-S Inland. The Navy will report monitoring results and any observed incidental take to the USFWS and the California Coastal Commission annually, and will adjust management to the vernal pools occupied by San Diego fairy shrimp to minimize any training impacts detected by monitoring. If impacts are more than the low levels anticipated or impacts could lead to the extirpation of fairy shrimp from any individual pool, then the Navy will reinitiate consultation with the USFWS.<br>• Current natural resource protection measures would continue, such as those derived through Navy Instructions, ecosystem-based planning in the INRMPs, and the employment of best management practices and standard operating procedures to avoid and minimize environmental impacts. Existing measures include invasive species control, erosion control, inventory, monitoring, and habitat enhancement. |

# 3.12 Birds

# 3.12 BIRDS

## 3.12.1 Affected Environment

### 3.12.1.1 Introduction

This section discusses avian resources for the purpose of comparing the environmental consequences of the Proposed Action and alternatives. The habitats used by birds traverse the terrestrial-marine line, and were described in Section 3.7, Marine Biological Resources, and Section 3.11, Terrestrial Biological Resources. Those sections are referenced in the descriptions of bird groups below. As much as possible, the abundance and diversity of these species groups are quantified to provide a full picture of the functions provided by the affected environment for birds. The current management of these resources in the Region of Influence (ROI) is also described, as appropriate.

All birds within the ROI are analyzed. This section examines and determines adverse effects to birds at the population level for Birds of Conservation Concern (United States Fish and Wildlife Service [USFWS] 2008). These are listed for the ROI in Section 3.12.1.4, Other Special Status Birds.

This section also details the more than 30-year history of Navy consultation with the USFWS and management relating to federally protected birds in the ROI. Since 1977, the Navy has expended extensive funds and resources to adapt to the growing California least tern (*Sternula antillarum browni*) nesting population and evolving Navy training needs at Silver Strand Training Complex (SSTC). The latest mitigation measures, listed in Section 3.12.1.5.3, detail the current status of the Navy's stewardship of least terns and snowy plovers in San Diego Bay. This management, as outlined in this document as well as in the history of Biological Opinions (BOs) on this issue, has been in anticipation of this EIS and associated Endangered Species Act (ESA) consultation. This EIS endeavors to establish a durable solution to bird management, one that allows for increased military training necessary to meet readiness needs.

#### 3.12.1.1.1 Regulatory Framework

#### Migratory Bird Treaty Act

The Migratory Bird Treaty Act (MBTA) of 1918 is the primary legislation in the United States established to conserve migratory birds. It implements the United States' commitment to four bilateral treaties, or conventions, for the protection of a shared migratory bird resource between the United States and Canada, Japan, Mexico, and the former Soviet Union. The MBTA prohibits the taking, killing, or possessing of migratory birds unless permitted by regulation. The species of birds protected by the MBTA appears in 50 Code of Federal Regulations (CFR) 10.13. The MBTA was amended in 2004 to exclude non-native migratory bird species that have been introduced by humans (intentionally or unintentionally) into the U.S. or its territories. The USFWS has published the final list of non-native bird species that are not protected under the MBTA (70 Federal Register 49 [15 March 2005], pp. 28907-28908).

The 2003 National Defense Authorization Act provides that the Secretary of the Interior shall exercise his/her authority under the MBTA to prescribe regulations to exempt the Armed Forces from the incidental taking of migratory birds during military readiness activities authorized by the Secretary of Defense.

Congress defined military readiness activities as all training and operations of the Armed Forces that relate to combat and the adequate and realistic testing of military equipment, vehicles, weapons, and sensors for proper operation and suitability for combat use. Congress further provided that military readiness activities do not include:

1. The routine operation of installation operating support functions, such as administrative offices, military exchanges, commissaries, water treatment facilities, storage facilities, schools, housing, motor pools, laundries, morale, welfare, recreation activities, shops, and mess halls;
2. The operation of industrial activities; or
3. The construction or demolition of facilities used for a purpose described in 1. or 2. above.

The final rule authorizing the DoD to take migratory birds during military readiness activities was published in the Federal Register on February 28, 2007. The regulation can be found at 50 CFR Part 21. The regulation provides that the Armed Forces must confer and cooperate with the USFWS on the development and implementation of conservation measures to minimize or mitigate adverse effects of a military readiness activity if it determines that such activity may have a significant adverse effect on a population of a migratory bird species.

The requirement to confer with the USFWS is triggered by a determination that the military readiness activity in question will have a significant adverse effect on a population of migratory bird species. An activity has a significant adverse effect if, over a reasonable period of time, it diminishes the capacity of a population of a migratory bird species to maintain genetic diversity, to reproduce, and to function effectively in its native ecosystem. A population is defined as "a group of distinct, coexisting, same species, whose breeding site fidelity, migration routes, and wintering areas are temporally and spatially stable, sufficiently distinct geographically (at some point of the year), and adequately described so that the population can be effectively monitored to discern changes in its status." Assessment of impacts should take into account yearly variations and migratory movements of the impacted species.

The actions analyzed in this section fall under this military readiness provision, as described in Section 3.12.2.1, Approach to Analysis, and the sections that follow it.

Migratory bird conservation relative to non-military readiness activities is addressed separately in a Memorandum of Understanding (MOU) developed in accordance with Executive Order 13186, signed January 10, 2001, "Responsibilities of Federal Agencies to Protect Migratory Birds." The Memorandum of Understanding between Department of Defense (DoD) and the USFWS was signed on July 31, 2006. DoD responsibilities discussed in the Memorandum of Understanding include, but are not limited to:

1. Obtaining permits for import and export, banding, scientific collection, taxidermy, special purposes, falconry, raptor propagation, and depredation activities.
2. Encouraging incorporation of comprehensive migratory bird management objectives in the planning of DoD planning documents.
3. Incorporating conservation measures addressed in Regional or State Bird Conservation Plans in Integrated Natural Resources Management Plan (INRMP).
4. Managing military lands and activities other than military readiness in a manner that supports migratory bird conservation.
5. Avoiding or minimizing impacts to migratory birds, including incidental take and the pollution or detrimental alteration of the environments used by migratory birds.
6. Developing, striving to implement, and periodically evaluating conservation measures for management actions to avoid or minimize incidental take of migratory birds, and, if necessary, conferring with the USFWS on revisions to these conservation measures.

### Endangered Species Act

The ESA also pertains to birds. The provisions of the ESA are that, once a species becomes listed as endangered or threatened, regulations to protect the species from illegal "take" become applicable to any project that may affect an individually listed animal or its habitat. The USFWS oversees the ESA implementation for all federally listed birds. Since San Diego Bay presently supports four federally listed birds, the USFWS becomes involved in all projects potentially affecting any of these species.

Under Section 7 of the ESA, federal project proponents must consult with USFWS if one or more listed birds may be affected by an action. Consultation with USFWS may range from informal discussions to formal consultation requiring a biological assessment by the project proponent. Other federal agencies may appropriately be named 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 incidental take of any listed species. When an "incidental take statement" is issued with the biological opinion, the federal project proponent may be excused from accidentally taking a listed species as part of the agency's otherwise lawful activity as long as the specified taking conditions are met. The federal ESA requires that USFWS, in cooperation with state agencies, implement a monitoring program for not less than five years following a delisting. This pertains to the American peregrine falcon and to the California brown pelican for the SSTC ROI. A monitoring plan was developed in cooperation with state resource agencies, representatives from each USFWS Region, and the Divisions of Migratory Birds, Endangered Species, and other cooperators. Should monitoring reveal that the American peregrine falcon is likely to become endangered, the species could be listed again under the ESA. The monitoring plan designates six geographical survey regions in 40 states where American peregrine falcons breed, and it calls for nests to be monitored five times at three-year intervals. Monitoring began in 2003 and will end in 2015. The plan calls for counting the number of American peregrine falcons returning to nesting sites, determining whether they nest successfully, and counting the number of young produced.

### 3.12.1.1.2 Definition of Resource

This section addresses Navy management of all species of birds that utilize the Silver Strand Training Complex and the southern portions of Naval Air Station North Island (NASNI), whether migratory or resident. The Silver Strand Training Complex and southern beaches and nearshore waters of NASNI are utilized by many bird species. All of these are addressed here. All but a handful of species (certain birds considered non-native, game, or pests) are protected by the MBTA (see above).

All nomenclature is based on the American Ornithologists Union (AOU) Checklist of North American Birds, except that bird names are not capitalized.

### 3.12.1.1.3 Regional Setting

The SSTC is a part of the Pacific Flyway used by millions of birds migrating between northern breeding grounds and southern wintering sites. It is one of a number of stopover sites used by migrants to replenish their energy during their long journey. San Diego Bay and nearshore Pacific Ocean waters support large populations of migratory birds that depend on local resources for food, shelter, resting, and staging before and during migration. Resident species that nest locally are in the salt marsh and upland habitats. Seabirds come northward from Mexico and Central America to nest on beaches and levees of the salt ponds. When compared to midwinter populations of the SCB, San Diego Bay provided habitat for more than half of the entire midwinter duck population. The majority of the regional surf scoter (*Melanitta perspicillata*, 72 percent) and brant (*Branta bernicla*, 66 percent) populations were present in central and south Bay. Forty-four percent of the region's bufflehead population used central and south bay in 1994, as did a similar percentage of scaup (U.S. Fish and Wildlife Service 1995a). Thirty-one percent of the midwinter brant population used central and south bay (U.S. Fish and Wildlife Service [USFWS] 1995a). San Diego Bay provides breeding, wintering, and/or stopover habitat for most of the shorebirds identified in the U.S. Shorebird Plan as having primary importance within the region.

Depending on the needs of the bird, they can utilize ocean beaches, salt marshes, and nearshore waters for roosting and foraging. Sandy beaches provide nesting habitat for locally nesting shorebirds, and also act as roosting places for shorebirds and gulls. The intertidal zone provides foraging habitat for multiple shorebird species as many shorebirds forage on invertebrates buried in the lower tidal zones. Seabirds will forage in the nearshore waters and nest in salt marshes, beaches, and salt pond levees. The nearshore ocean accommodates birds such as gulls, pelicans, terns, and cormorants, which prey upon the schooling fish and other marine organisms below.

San Diego Bay is part of a network of southern California bays that provide haven for a large diversity of birds due to their sheltered and nutrient-rich waters. The shallow water and shoreline provide roosting, foraging, and nesting areas for ducks, terns, shorebirds, pelicans, cormorants, gulls, herons, raptors (such as ospreys [*Pandion haliaetus*] and northern harriers [*Circus cyaneus*]), and various passerines in the surrounding vegetation.

Threatened and endangered bird species with known or expected occurrence in the project area include the California brown pelican (*Pelecanus occidentalis californicus*), California least tern, western snowy plover (*Charadrius alexandrinus nivosus*), and light footed clapper rail (*Rallus longirostris levipes*).

Many migratory birds are in decline regionally and globally. About one-third of bird species dependent on local bays and estuaries have been identified as sensitive or declining by the federal or state governments, or by the Audubon Society. The most common reasons attributed to bird population declines are habitat loss and habitat fragmentation (Groom et al. 2006, Brown et al. 2001, Shuford and Gardali 2008). Shrinking habitat locally, regionally, and along the entire Pacific Flyway is probably the most important and well recognized issue affecting survival of many birds dependent on San Diego Bay through overcrowding, stress, competition, poor nutrition, and increased mortality (Brown et al. 2001, Shuford and Gardali 2008). While San Diego Bay's habitat losses are similar to those of other bays, this complicates an assessment of declines due to local causes versus regional or more distant causes Birds that are increasing in number include the more generalist species and those tolerant of human disturbance such as the western gull (*Larus occidentalis*), common raven (*Corvus corax clarionensis*), and American crow (*Corvus brachyrhynchos hesperis*).

#### 3.12.1.1.4 Region of Influence

The ROI for avian resources includes all of SSTC-North (SSTC-N) and SSTC-South (SSTC-S), as well as the southern sandy beaches, Zuniga Jetty, and other riprap jetties of NASNI. Also included are the oceanside and bayside training lanes as well the ocean anchorages located offshore of SSTC-N.

### 3.12.1.2 Bird Groups

More than 300 bird species, representing 30 families, have been documented to use San Diego Bay for either foraging, roosting or nesting. The majority of birds using San Diego Bay are migratory and may only use the bay as a stopover site to rest and eat before continuing their migration. Other bird species, termed summer or winter visitors, use the bay part of the year for either breeding or wintering. Species that migrate to San Diego Bay to nest are predominantly seabirds. South San Diego Bay is home to a large multi-species seabird colony annually from April through May. Other birds, residents, remain in the area year-round and use San Diego Bay for both breeding and wintering. Occasionally, migrating birds not normally observed will become disoriented due to migration or weather events and are termed vagrants or transient migrants. Although these birds are not dependent on San Diego Bay for more than temporary shelter or food, a considerable number of them pass through the area annually.

San Diego Bay contributes more protected, shallow habitat to the Pacific Flyway waterbird populations that any other bay or estuary situated along the 180-mile coastal region of southern California (Baird 1993). When compared to midwinter populations of the Southern California Bight (SCB) as a whole, San Diego Bay supports more than half of the entire midwinter duck population. The majority of the regional surf scoter (*Melanitta perspicillata*) and brant (*Branta bernicla*) populations use central and south San Diego Bay (USFWS 1995). Close to half of the region's bufflehead population uses central and south San Diego Bay, as does a similar percentage of scaup (USFWS 1995; Tierra Data Inc. 2008).

San Diego Bay provides breeding, wintering, and/or stopover habitat for most of the shorebirds identified in the U.S. Shorebird Plan as having primary importance within the region. Of the 10 species for which coastal habitats in the Southern Pacific Region are especially important, the black-bellied plover (*Pluvialis squatarola*), western snowy plover, semipalmated plover (*Charadrius semipalmatus*), willet (*Catoptrophorus semipalmatus*), marbled godwit (*Limosa fedoa*), black turnstone (*Arenaria melanocephala*), short-billed dowitcher (*Limnodromus griseus*), and red-necked phalarope (*Phalaropus lobatus*) are supported locally.

Three separate surveys of avifauna of San Diego Bay in 1993-1994 resulted in an estimate of over seven million bird-use days per year, with substantial peaks and lows through the year, based on the average number of sightings during survey days (USFWS 1995, 1994; Ogden 1995). All surveys reported an abundance peak about December (November through February for the central Bay by Ogden [1995]), but in the salt ponds of south bay there is another peak in the fall due to the arrival of many red-necked phalaropes (Ogden 2005, Tierra Data Inc. 2008). Western sandpiper (*Calidris mauri*) was the most abundant species in 2006-2007 surveys covering the entire bay, with its highest count in September (Tierra Data Inc. 2008). The American wigeon *(Anas americana)* and dowitchers *(Limnodromus* spp.*)* contribute substantially to the abundance peak in December. The American wigeon is a common winter visitor seen where other ducks are seldom found due to grazing of aquatic vegetation, eelgrass its favorite food in San Diego Bay (Unitt 2004). Most of the American wigeons surveyed were in the south bay and salt ponds. All surveyors found a survey abundance low point around June.

The most recent survey sponsored jointly by the Navy and Port of San Diego in 2006-2007 (Tierra Data Inc. 2008) added 509,562 bird observations. For the first time, both waterfowl and shorebirds were targeted during the same survey period to get the most comprehensive look at avian species use to date, with shoreline and water observation hours of effort totaling over 700 hours. Figures 3.12-1 through Figure 3.12-3 depict the abundance and diversity of avian species observations based on a San Diego Bay habitat grid. Shorebird surveys took place monthly (excluding May and July) between March 2006 and February 2007; conducted in the four hours before low tide. These falling tide surveys were designed to capture bird use of foraging habitats as mudflats and other substrates became exposed by the receding water. Quarterly peaking tide surveys were also conducted, over the crest of the tide, four times during the year. These surveys were designed to observe high tide refugia, or areas that contained high bird use which would be missed during falling tide surveys. The bay and ocean shoreline were surveyed on foot or by boat, depending upon the most advantageous view and access. Surveys to detect the presence of waterbirds took place once monthly between November 2006 and February 2007, when maximum migratory waterbird presence was expected.

About 195 species of birds use coastal or offshore aquatic habitats in the SCB (Baird 1993). In the SCB as a whole, bird numbers and biomass are highest in the winter, when high-latitude nesters stop in the area. A very different assemblage of bird species occurs in San Diego Bay in spring and summer than in the winter when northern migrants dominate.

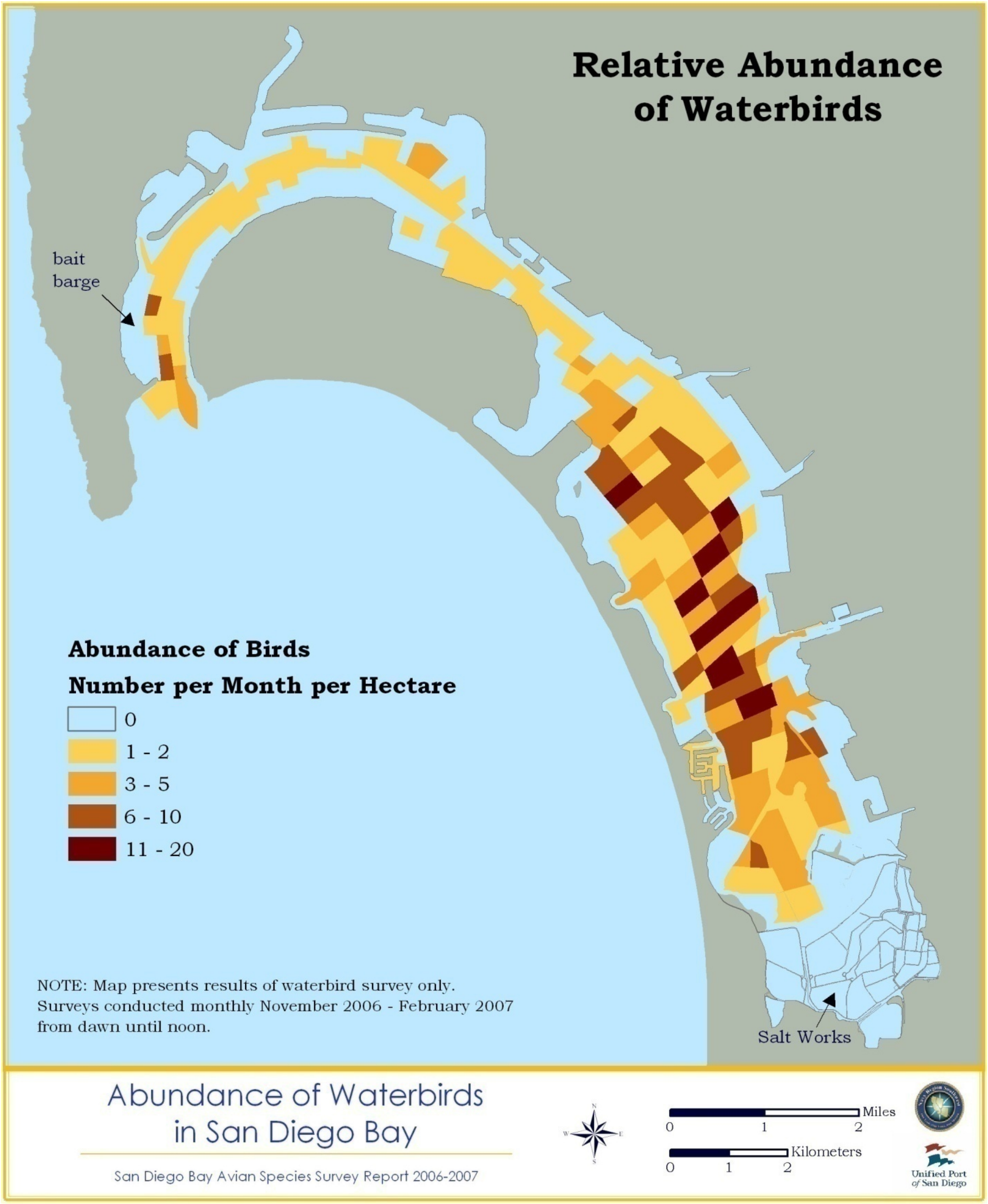



**Figure 3.12-1: Relative Abundance of Waterbirds in San Diego Bay.**

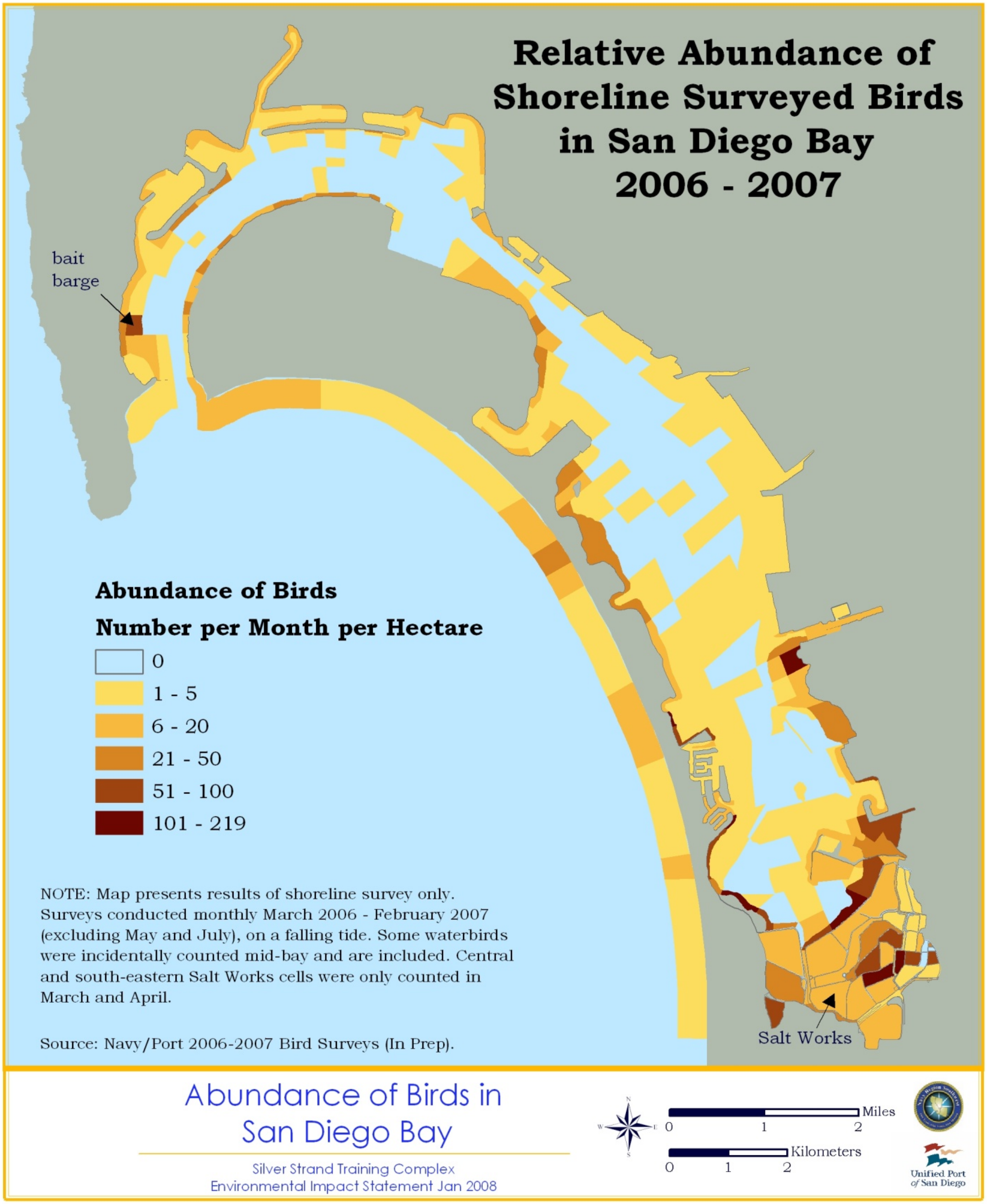



**Figure 3.12-2: Abundance of Birds in San Diego Bay and Nearshore Ocean**

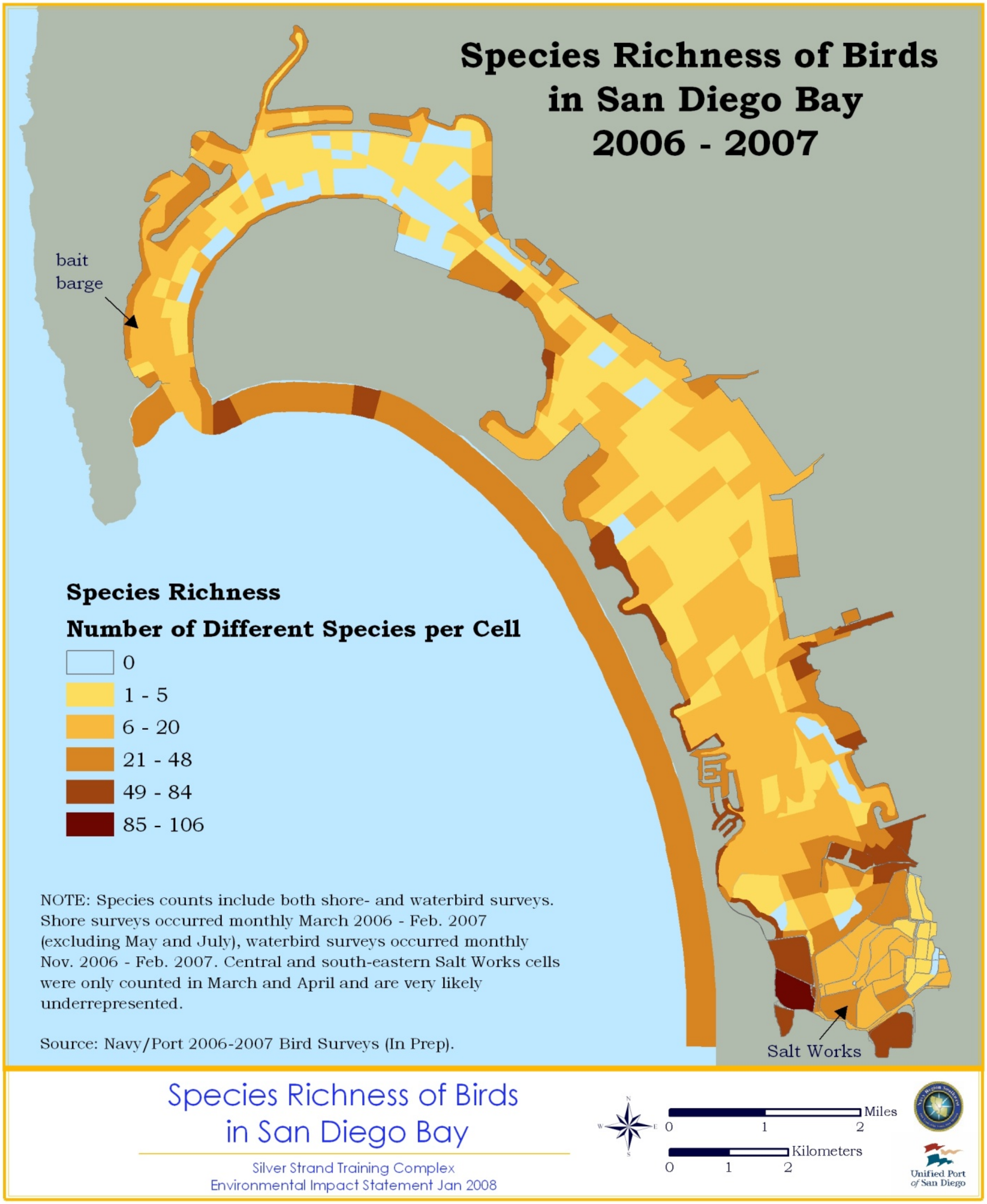



**Figure 3.12-3: Species Richness of Birds in San Diego Bay and Nearshore Ocean**

### 3.12.1.2.1 Waterfowl

From late fall through the winter (November through February), the greatest numbers of waterfowl are present in the ROI to rest and forage including ducks, geese, coots, and grebes. The majority migrate north to breed during the late spring and summer months. During 2006-2007 bay surveys (Tierra Data Inc. 2008*)*, the number of waterbirds observed per month was greatest in January and lowest in November (Table 3.12-1).

Surf scoters were found to be the most abundant birds on San Diego Bay. They were the predominant species in both the central and south San Diego Bay. They appear from the surveys to be more widely distributed and make greater use of deep water than other waterfowl. They seem to prefer nearshore areas along the shoreline of NASNI, of north San Diego Bay, and around Naval Base Point Loma.

Diving ducks feed by diving from the surface and swimming underwater. Those dependent on San Diego Bay include the greater scaup (*Aythya marila*) and, most abundantly, the lesser scaup (*A.affinis*), which primarily feeds on clams and snails, but also eat aquatic insects, crustaceans, and plants. Scaup also were relatively more abundant in central and south San Diego Bay. Scaup are more heavily dependent on south San Diego Bay than scoters and more restricted to the west side of central San Diego Bay. Scaup are absent from April to mid-November. The bufflehead (*Bucephala albeola*) feeds especially on the brine shrimp and brine fly larvae of salt ponds.

Most dabblers, defined as such since they eat the vegetation at the surface or just below the water level. These birds which include the northern shoveler (*Anas clypeata*), American wigeon (*A. Americana*), gadwall (*A. strepera*), northern pintail (*A. acuta*), green-winged teal (*A. crecca*), cinnamon teal (*A. cyanoptera*), and mallard (*A. platyrhinchos*) are at or above North American Waterfowl Management Plan population goals. These birds are not obligate saltwater species and can use freshwater sources which allows them more flexibility in habitat use.

Waterfowl movement areas, such as crossover points between San Diego Bay and the ocean at Emory Cove and Delta Beach, have been identified (Copper 2007). The USFWS (Manning 1998) observed that brant geese established a movement corridor between beds of eelgrass in south San Diego Bay between the east and west shores.

**Table 3.12-1: Number of birds observed per month during San Diego Bay waterbird surveys.**

| Month | Number of Birds Observed 2006-2007 |
|---|---|
| November | 4,207 |
| December | 8,777 |
| January | 11,663 |
| February | 7,165 |

During the course of the 2006-2007 Port-Navy surveys, 31,812 birds of 47 different species were observed during waterbird focused surveys. Results of shoreline focused surveys also infer that the west shore ocean beaches are used for roosting by waterfowl. Common in these nearshore coastal waters are the eared grebe (*Podiceps nigricollis*) and horned grebe (*P. auritus*).

### 3.12.1.2.2 Shorebirds

Shorebirds typically use the interface between terrestrial and marine resources. However, shorebirds are highly migratory, and many shorebirds with long migrations use habitats that are widely dispersed across the landscape. Each species has different geographic breeding and non-breeding distributions, population size, and dispersion patterns. Some species breed or winter in the U.S., while others do neither but depend upon key habitats in the U.S. for completing their migrations (Brown et al. 2001).

In addition to the energetic cost of transport, shorebirds must find periodic stopovers to rest and refuel. While at these stopover places, birds must deal with the local climate and environmental conditions which includes predation pressure and uncertainty of resources (Moore et al. 1995, 2005). These challenges combined with changes in habitats and landscapes along historical migratory pathways create hardships in terms of reproductive success and survival for these birds (Skagen 2006). Studies completed by Baker et al. (2004) and Morrison (2006) demonstrate that red knots who failed to gain enough weight during migration to the breeding grounds suffered reduced survival.

During migration shorebirds use an opportunistic foraging strategy in which they will consume whatever is present and palatable; but if food resources in the area are lacking, they will move on to other areas that have food resources adequate to their needs (Colwell and Landrum 1993). As foraging sites are limited in southern California, shorebirds have compensated by grouping in high densities which will deplete food sources and force the birds to move to another site to forage (Duffy et al. 1981). Instead, the birds may decide to leave the area entirely to find better foraging grounds along the migration pathway. This forced move may have consequences on the fitness of the bird for survival and breeding (Baker et al. 2004, Morrison 2006). The period of greatest competition among shorebirds is midwinter (Quammen 1981, 1982, cited in Baird 1993). Reasons for this include lowered prey biomass and patchier prey density. Greater minus tides in the winter partially offset this by exposing more mudflats and a greater feeding opportunity for shorebirds. Choice of shorebird feeding location is influenced by individual foraging preference, prey abundance and density, water level, and available foraging habitat (Colwell and Landrum 1993; Collazo et al. 2002; Finn et al. 2008).

Sandpiper species and their allies are seen primarily at the south end of San Diego Bay. Peak abundance, in south San Diego Bay and Salt Works, is in August during the fall migration (USFWS 1994). Abundance data from the most recent San Diego Bay-wide bird surveys, which did not extensively sample the Salt Works and were not conducted in either May or July, are displayed in Figures 3.12-4 through 3.12-6. Shorebirds can be hard to identify in the field, and often are either misidentified or missed in censuses due to their size and cryptic coloration. Most are migratory and they are highly mobile, adding to the surveying difficulty. Some areas around San Diego Bay are predictable for seeing shorebirds at low tide, but high-tide refugia are as hard to predict as feeding areas. Shorebird abundances have been impacted by the loss of intertidal flats for foraging, as well as upland transitional areas for roosting and nesting. Shoreline stabilization and bulkheads can preclude intertidal habitats, from which shorebirds get most of their nutrition. Bird use at the Chula Vista Bayfront, examined over 1.5 years (Jones and Stokes Associates, Inc. 1988), was found to be highest where mudflat was the dominant habitat.

For shorebird species that can take advantage of different soil substrates and food sources, agricultural fields can provide an alternative foraging ground (Taft and Haig 2006; Ogden et al. 2008). There is substantial movement between the Tijuana Estuary and San Diego Bay and the agricultural fields of the Tijuana River Valley and San Diego Bay.

On the ocean beaches, shorebirds will forage upon invertebrates in the damp, sandy middle and lower tidal zones as well as use the beach for roosting (resting). Kelp and surfgrass that have washed ashore are good foraging areas for gulls, shorebirds, and even some passerines (songbirds), as they harbor and are fed upon by invertebrates. Other areas of rocky/reef substrates, such as the jetties, provide encrusting and other marine animals for foraging gulls and shorebirds.

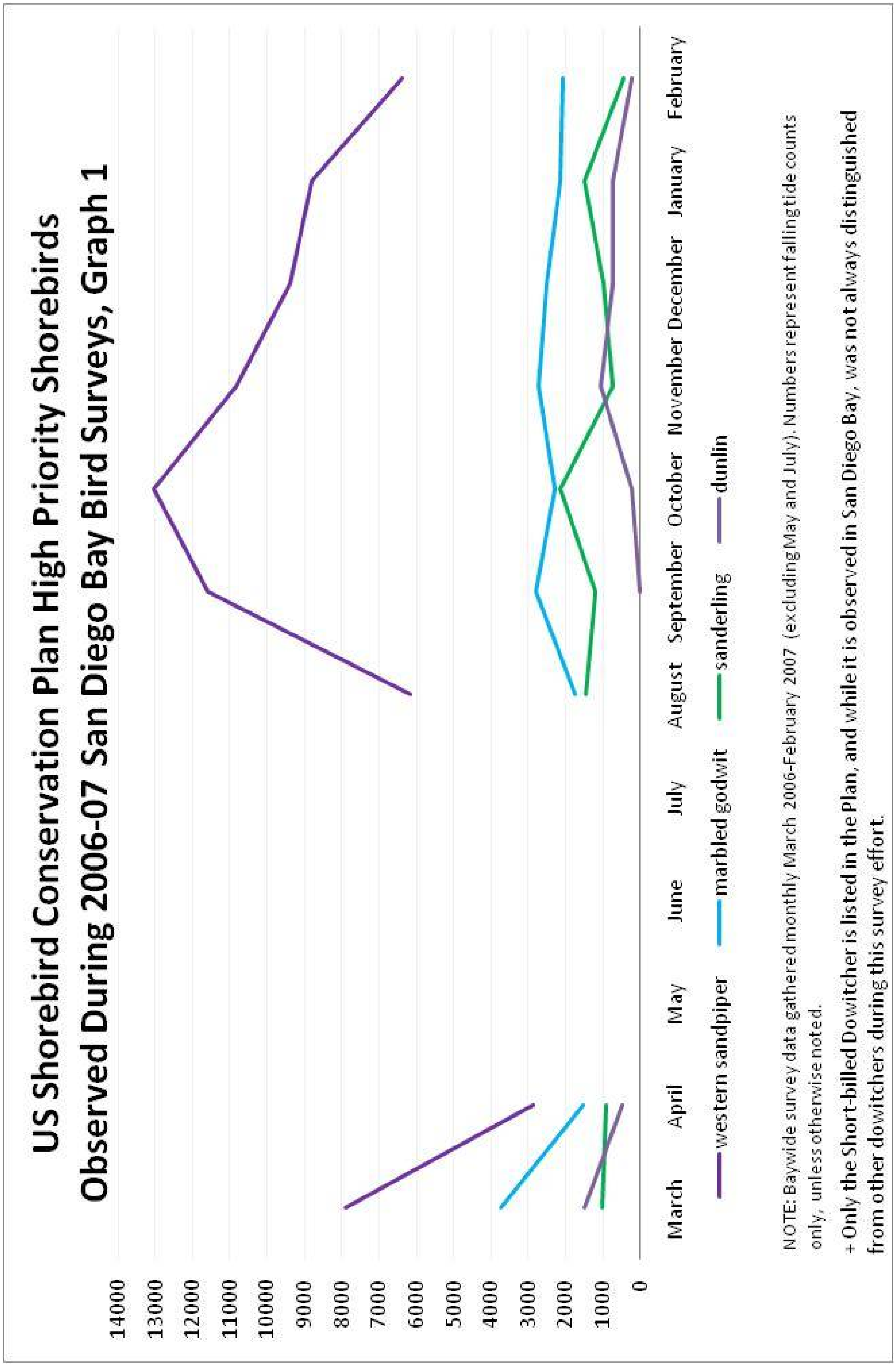



**Figure 3.12-4: United States Shorebird Conservation Plan Species Observed during the Most Recent San Diego Bay Bird Surveys. Surveys were not conducted during May and July 2006.**

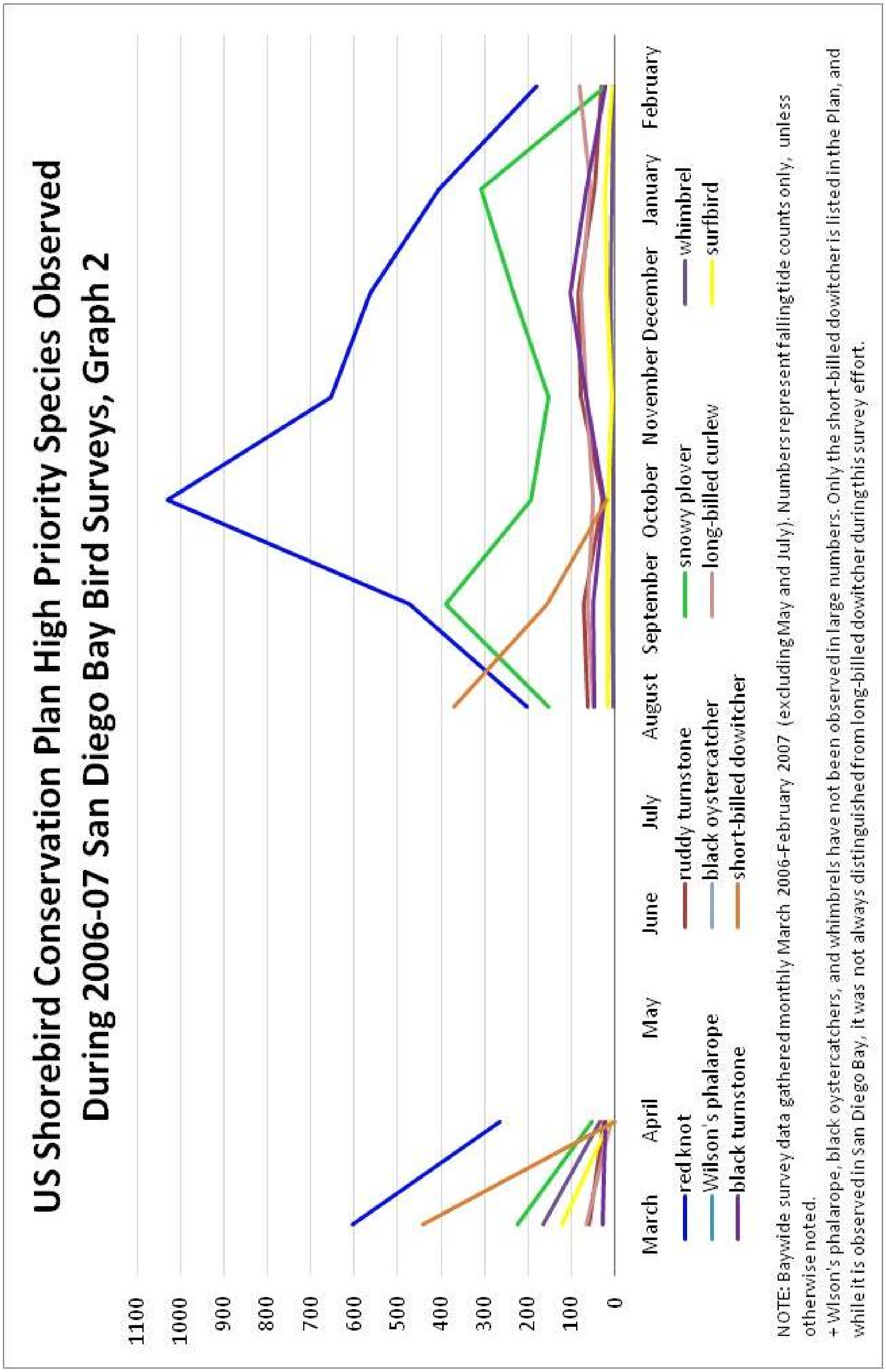



**Figure 3.12-5: United States Shorebird Conservation Plan Species Observed during the Most Recent San Diego Bay Bird Surveys. Surveys were not conducted during May and July 2006.**

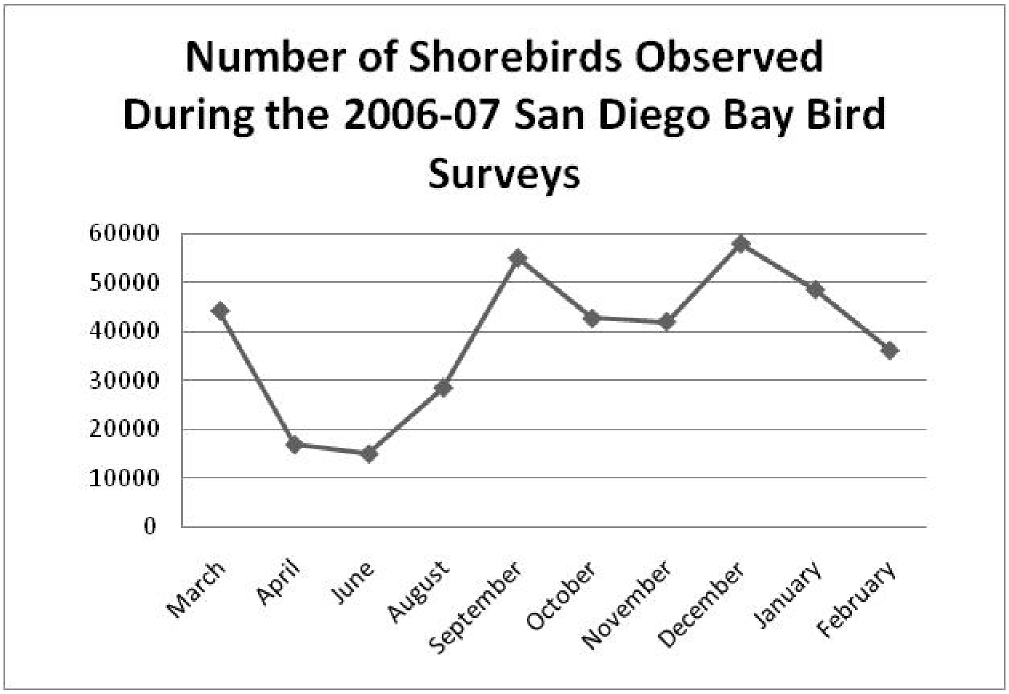



**Figure 3.12-6: Number of shorebirds observed during the 2006-2007 San Diego Bay Avian Surveys.**

A total of 429,003 birds were observed during the course of the 2006-2007 Navy-Port surveys, including 210 distinct species. Almost 400,000 of the observations were when the focus was on the shoreline as opposed to open water. During the shorebird surveys, birds were generally denser along extensive mudflat areas in south San Diego Bay as well as around the commercial bait fish storage barge in north San Diego Bay. Even though complete salt pond data are only available for March and April, this area has a very high density of shorebirds. The number of shorebirds observed per month varied considerably during 2006-2007 shoreline surveys during a falling tide, with a low of 15,014 in June and high of 58,087 in December. The falling tide generally corresponds to periods when shorebirds are feeding.

**Table 3.12-2: Number of shorebirds observed each month during the falling tide shoreline survey.**

| Month | Number of Birds Observed |
|---|---|
| **2006** | |
| March | 44,340 |
| April | 16,904 |
| June | 15,014 |
| August | 28,560 |
| September | 55,143 |
| October | 42,761 |
| November | 42,093 |
| December | 58,087 |
| **2007** | |
| January | 48,651 |
| February | 36,202 |

#### 3.12.1.2.3 Seabirds

Seabirds are almost as diverse a group of birds as are shorebirds. A seabird is defined as such because it spends the majority of its life at sea only coming to land to breed at colonies along the coast. Foraging strategies are species specific such as plunge-diving or pursuit diving. Plunge-diving, as utilized by terns and pelicans, is a foraging strategy in which the bird hovers over the water and dives into the water to pursue fish. Pursuit divers, a common foraging strategy of cormorants, grebes, and auklets, usually float on the water and dive under to pursue fish and other prey. They most commonly eat fish, squid, and crustaceans (Baird 1993).

As with shorebirds, prey density is very patchy and dependent upon primary productivity. Diving species of seabirds predominate in areas where certain processes maintain standing stocks of phytoplankton, making the water turbid (Briggs and Chu 1987). The northern anchovy is one of the most common prey items for sea birds of the SCB. Abundance of northern anchovy (*Engraulis mordax*) larvae is tied to these areas of concentrated phytoplankton off the coast. Large numbers of dinoflagellates, a component of the phytoplankton, serve as food for anchovy larvae (Pondella 2006). Depending upon the seabird species using San Diego Bay, they most are often foraging for schooling fish such as anchovies and topsmelt.

Within the SCB and in the ROI, the most abundant seabirds in coastal beach and nearshore ocean areas are the surf scoter, pacific loon (*Gavia pacifica*), black storm-petrel (*Oceanodroma melania*), brown pelican, elegant tern tern (*Sterna elegans*), Brandt's cormorants (*Phalacrocorax penicillatus*), phalaropes, and various gulls. The most common gulls are Heerman's gull (*Larus heermanni*), ring-billed gull (*L. delawarensis*), California gull (*L. californicus*), Herring gull (*L. argentatus*), and western gull. Several tern species besides the California least tern use the nearshore areas and San Diego Bay for foraging. These include elegant tern, Forster's tern (*Sterna forsteri*), Caspian tern (*S. caspia*), and black skimmer (*Rynchops niger*).

Over 70 species of birds are known or expected to occur in the nearshore ocean area, including the California brown pelican and California least tern. The upper tidal beaches are utilized by gulls as roosts (resting-places).

#### 3.12.1.2.4 Marsh and Wading Birds

Marsh birds are species that utilize the marsh as foraging and breeding grounds such as soras, Virginia rails, and clapper rails. Populations of many marsh birds have declined in North America (Ribic et al. 1999), and destruction of marshes has reduced numbers in coastal southern California (Garrett and Dunn 1981). Feeding habits are not well known, and are based on general accounts from California. Small crustaceans, small mollusks, aquatic insects, beetles, snails, and spiders have been observed a part of the rail diet. Marsh birds that are reportedly declining in numbers in the SCB include the light-footed clapper rail and the Virginia rail (*Rallus limicola limicola*). The California black rail's (*Laterallus jamaicensis coturniculus*) range historically extended along the southern California coast into Baja California, but is now believed extirpated from San Diego Bay (Evens 1991).

Other birds that utilize the marsh and estuarine habitat are wading birds such as egrets and herons. These birds feed on a variable mix of fish, crayfish, amphibians, snakes, terrestrial rodents, lizards, and insects. The black-crowned night heron feeds mostly at night, feeding on young shrimp and fish, but adults have a broader diet of terrestrial rodents, amphibians, aquatic insects, and crustaceans. Wading birds often fly a short distance inland to roost and nest in groves of trees, but return to the marsh daily to feed.

### 3.12.1.3 Threatened or Endangered Species

Federally listed birds observed at SSTC include the California least tern, western snowy plover, and light-footed clapper rail.

### 3.12.1.3.1 California Least Tern

The California least tern is listed by both the USFWS (35 FR 16047 October 13, 1970) and under the California Endangered Species Act as endangered. Historically, the least tern's range extended from San Francisco Bay south to San Jose del Cabo, Baja California Sur, Mexico (Cogswell 1977, Massey 1977). Wintering areas are in Mexico and Central America. Little information regarding the status of the least tern is available for the portion of the species' range that extends into Mexico. Recent work by Palacios and Mellink (2003) observed 45 least tern colonies on the Baja Peninsula ranging in size from approximately one pair (Isla Piedra) to 68 pairs (Bahia San Quintin). Of the 30 colonies that had been previously observed, 24 exhibited apparent population declines or were absent in 2003. Human disturbance at former coastal nesting areas has reduced the breeding population in California (Garrett and Dunn 1981), and was noted as early as the mid-1920s (Schneider 1926). Such disturbance along California beaches for recreational, residential, and industrial development severely diminished the availability of suitable least tern nesting habitat. In San Diego County, it is a fairly common summer resident from mid-April to September (Unitt 2004, 1984).

During the breeding season which ranges from April through August, the majority of the least tern population is concentrated in southern California within the counties of Los Angeles, Orange, and San Diego. Over half (60.4 percent in 2008, 4240 pairs) of the U.S. least tern breeding population is located within San Diego County, a large portion of which nests at Camp Pendleton (Marschalek 2009; Figure 3.12-7).

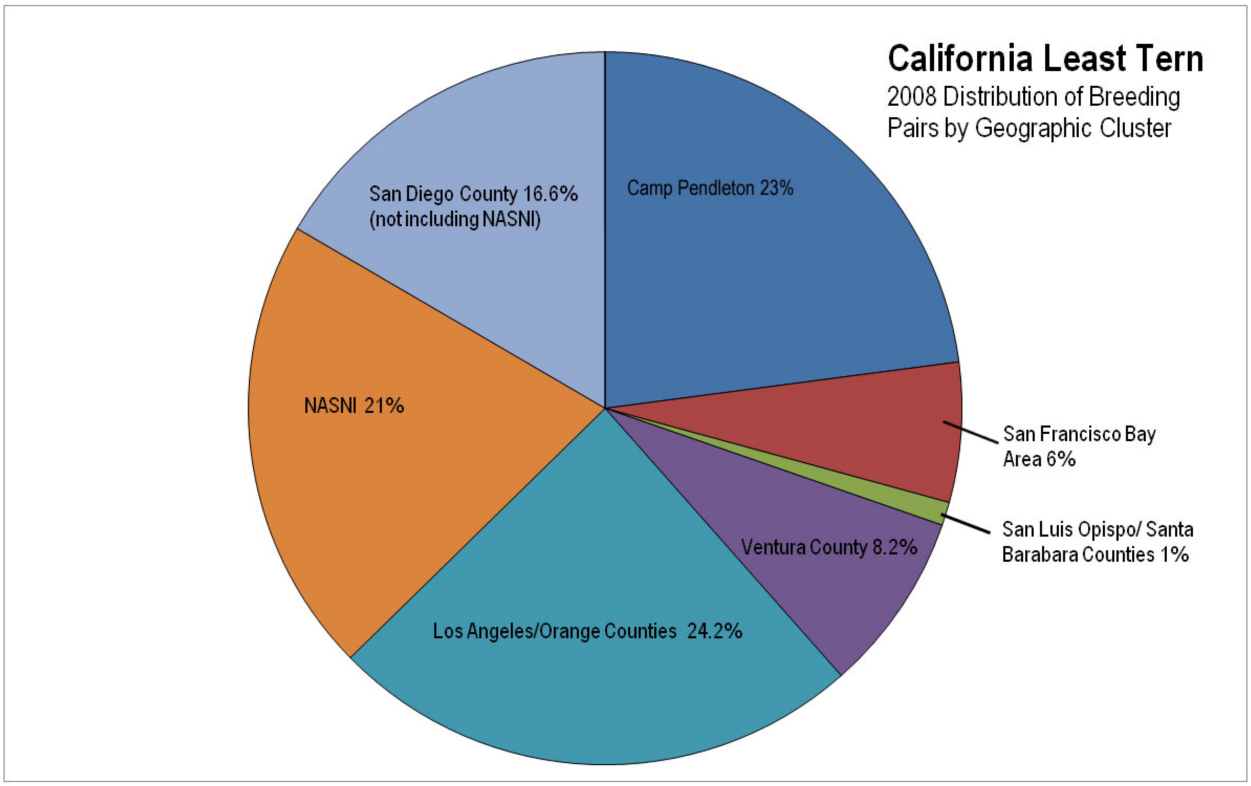



**Figure 3.12-7: Regional Productivity of California Least Tern, 2008 Breeding Pairs**

This small migratory tern historically nested colonially on beaches that were undisturbed, sparsely vegetated, and flat with loose, sandy or gravelly substrate and water nearby for foraging (Swickard 1972, 1971; Rigney and Emery 1980). Few undisturbed beach nesting areas remain and least terns are now found in varied habitats ranging from mudflats to airports. Loss of nesting habitat in conjunction with increased loss of foraging areas, human disturbance, and predation at remaining breeding colonies resulted in a federal designation of endangered status in 1970 (35 FR 1604).

California least terns forage in nearshore ocean waters and in shallow estuaries or lagoons in areas with water less than 60 feet deep (Atwood 1986; Massey 1987). A study at Huntington Beach revealed that adults also forage close to shore in ocean waters, mostly within 3.2 km of the breeding area (Collins et al. 1979; USFWS 2006c). Long-term data indicates that forage species for the tern occur broadly within the San Diego Bay (Allen 1999) and that the birds feed opportunistically (Department of the Navy [DoN] 2006). Terns are known to capture more than 50 species of fish and feed exclusively on small fish that frequent shallow, nearshore waters (Atwood and Kelly 1984; Atwood and Minsky 1983; Bailey 1984; Collins et al. 1979; Massey 1974; Minsky 1984; Thelander 1994). Prey include such schooling fish as northern anchovy, topsmelt (*Atherinops affinis*), killifish (*Fundulus parvipinnis*), mosquitofish (*Gambusia affinis*), and shiner surfperch (*Cymatogaster aggregata*; USFWS 2006b). After their eggs hatch, breeding adults catch and deliver small fish to the flightless young. The young begin to fly at about 20 days of age but continue to be fed and are taught how to feed by their parents for some time after fledging. Reproductive success is, therefore, closely related to the availability of undisturbed nest sites and nearby waters with adequate supplies of appropriately sized fish.

Some nonbeach, and even nonsandy, surfaces have been successfully used by least terns for nesting (Massey and Atwood 1979-1985). Least tern nests use small depressions, or scrapes, in the substrate, usually sand, that may or may not be lined with shell debris or pebbles. Nesting is characterized by two waves. Most of the initial nesting attempts are made by experienced breeders and are completed by mid-June. A second wave usually occurs from mid-June to early August, which comprises re-nests after initial failures and second year birds nesting for the first time (Massey and Atwood 1981). Least terns lay from one to four eggs (two, on average) which are incubated for 20 to 28 days by both adults. Young fledge 20 to 28 days after hatching, with a mean time of about 21 days, and are fed by adults for an additional two to three weeks. The terns abandon the nesting colonies by mid-August and generally migrate south by mid-September. Banding returns indicate that least terns exhibit a tendency to return to the site where they first bred successfully and they exhibit a high degree of nest site fidelity from year to year (Atwood and Massey 1988). The factors which can affect colony site fidelity include reproductive failure and the physical attributes of the nest site such as the amount of encroachment by vegetation.

Episodic reproductive failure or reduction in population size has been attributed to cold, wet weather, extreme heat, dehydration, starvation, unusually high surf or tides, and human disturbance (USFWS 2006c). Additionally, the El Niño warm sea current phenomenon can have deleterious long-term effects on the entire least tern population. During the El Niño event of 1982-1983, diminished fish populations throughout the SCB caused a drastic reduction in least tern breeding success resulting in the lowest annual production of fledged young on record (Massey 1988, Massey et at. 1992). Subsequently, it took five years for the population to recover from this event. El Niño conditions were also evident during the 1992 breeding season which resulted in a reduced statewide production of fledglings (Caffrey 1993); similar effects were seen during the 1997 El Niño event.

Nesting density ranges from one to three per acre, but may be much greater, such as 145 nests on about 1.9 acres at Camp Pendleton (Swickard 1972, 1971). Conflicting uses of southern California beaches during the least tern nesting season have precluded the use of most natural nesting sites. Because of the lack of availability of large expanses of beach, many colony sites have been restricted to small discrete areas often protected by fencing. Although this species is loosely colonial in nature, least terns have been artificially concentrated within these fenced areas, often adjacent to heavily used public beaches or on tiny man-made islands, since beach front property is at such a premium for human activities (Marschalek 2006; USFWS 1985a). The adults, eggs, and young are thus confined, rendering them susceptible to major problems such as predation and disturbance with limited options to relocate. Hence, predator control is considered by many species experts to be one of the most crucial management strategies for reproductive success (Foster 2006; USFWS 2006c).

In addition to nesting areas, secure roosting areas are essential to the recovery of the species. Two kinds of roosting areas exist: preseason nocturnal roosts and postseason dispersal sites where adults and fledglings congregate. The best documented night roost is in Long Beach, California; however, no recent surveys have been conducted to verify its continued use (Atwood 1986).

Predators of least tern adults, young, or eggs include rats (*Rattus spp.*), domestic cats (*Felis cattus*), domestic dogs (*Canis familiaris*), red fox (*Vulpes vulpes*), red-tailed hawk (*Buteo jamaicensis*), northern harrier, gopher snakes (*Pituophis melanoleucus*), black-crowned night heron (*Nycticorax nycticorax*), American kestrel (*Falco sparverius*), American crow, burrowing owl (*Athene cunicularia*), loggerhead shrike (*Lanius ludovicianus*), common raven, coyote (*Canis latrans*), skunk (*Mephitis mephitis*), opossum (*Didelphis virginiana*) and gull-billed terns (*Sterna nilotica vanrossemi*) (USFWS 1990). The sensitive status of some predatory species requires special consideration and may reduce the predator management options available. For example the gull-billed tern, a California Bird Species of Special Concern, has recently been posed as a localized problem for least terns nesting on beaches around San Diego Bay. The USFWS, Migratory Bird Office has not issued depredation permits for the removal of gull-billed terns or gull-billed tern eggs due to the sensitive status of this species. This situation also exists for the peregrine falcon.

There is concern that predation by gull-billed terns may affect the long-term potential for least tern colonies in this area. This issue is of particular concern for terns nesting on Navy installations adjacent to San Diego Bay, because reproductive success (number of fledglings/pair) has declined in recent years, and is in part attributable to predation of California least tern chicks at the Naval Amphibious Base (NAB) beaches. Reproductive success in the San Diego Bay area has been extremely low since 1999. For example, the number of fledglings per pair produced at the SSTC was 0.17 in 2006 was less than half of the statewide average. In comparison, at the NASNI Maintenance and Training (MAT) site, the number of fledglings per pair produced was 0.21 (Marschalek 2007). Reproductive success for SSTC was about 0.19 in 2007, and 0.097 in 2008. The reason for the lower number of fledglings produced by each pair is not known. On the Delta Beaches and the NAB oceanside beach, lower reproductive success is thought to be due, in part, to increasing foraging intensity by gull-bill terns during the hatching phase of least tern reproduction based on monitoring data collected and certain confirmed cases of gull-billed predation (Avian Research Associates 2007, 2008). Many factors, however, can contribute to low reproductive success.

During 2006, the number of fledglings per pair produced at NAB was 0.17, less than half of the statewide average. At the NASNI MAT site, the number of fledglings per pair produced was 0.21 (Marschalek 2007). Low fledge rates in recent years on Silver Strand beaches, especially those outside of NASNI, are due in large part to the presence of gull-billed terns (Copper 2007). While NASNI is in the same geographic area as NAB, it has not been subjected to observed depredation by foraging gull-billed terns. Gull-billed terns continue to forage and roost on nesting sites during the breeding season. Pending the continued approval of the USFWS Migratory Bird Office for predator control personnel from U.S Department of Agriculture to employ pole traps, the Navy plans to remove avian predators such as the American kestrel from nesting colonies (USFWS 2007b). The Navy modified chick shelters in 2006 to be more accommodating to least tern chicks.

Concurrent with fluctuations in the overall numbers of breeding pairs in San Diego Bay are fluctuations in the number of occupied sites and the number of pairs using each site. Declines at one nesting site sometimes are balanced by increases at another nearby site and are most likely a result of inter-colony movement. These shifts appear to be related to heavy predation or human disturbance event(s) which can result in poor reproductive success. The number of sites available is important to the tern population in allowing inter-colony movement in response to failure at a particular site. Of concern is the apparent trend towards fewer, larger colonies that concentrate the species into fewer areas, which may facilitate vulnerability to predation. Management actions that provide for a greater number of dispersed colonies could be beneficial to the long-term recovery of the species (USFWS 1985).

Upon its designation as endangered, California statewide efforts to implement protection for least tern nesting and foraging areas contributed to a breeding population increase from 623 pairs in 1969 to an estimated 7,006 pairs in 2006. Generally, growth has been positive except for 2002 with a one-year loss of over 1,100 breeding pairs, and 2004, with a one-year loss of over 500 pairs (Keane 1998, 1999, 2000, and 2001 as cited in USFWS 2006c). The statewide population size has grown substantially since 1973 (Figure 3.12-8). Fledgling production has fluctuated more widely with unknown consequences for overall population numbers (Marschalek 2009).

Efforts to model least tern population viability have been frustrated by incomplete information about the species' demography, effects from environmental stochasticity, and wintering habitat location. Age at first breeding is estimated to be approximately 3 years (Akçakaya et al. 2003 ), with a breeding life span estimated at approximately 10 years (Massey et al. 1992). Records of a California least tern 15 years old are available (Kennard 1975), while other least tern subspecies have been documented to survive to 24 years (Klimkiewicz and Futcher 1989).

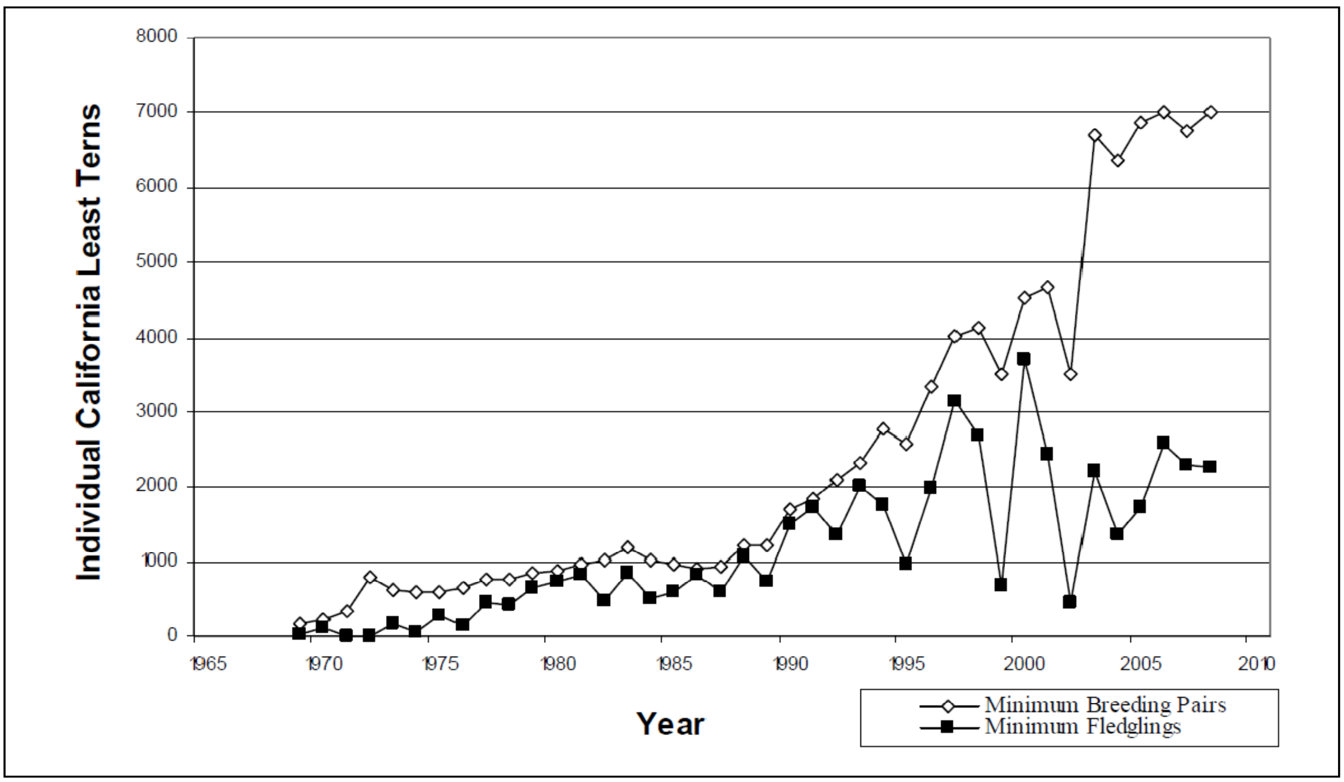



**Figure 3.12-8: Historical Statewide California Least Tern Breeding Data, Marschalek 2009.**

The number of least terns in the San Diego Bay area has increased in conjunction with the statewide increase (Table 3.12-3). After a period of apparent instability during the 1980s, the population has been increasing since 1992. The San Diego Bay-wide breeding numbers experienced a substantial increase from 141 pairs in 1991 to 1,813-2,038 pairs in 2008. San Diego Bay least terns also increased in relative range wide importance. In 1996, the breeding number of least terns in San Diego Bay was estimated at 436 pairs or 13 percent of the range-wide population. In 2001, the breeding number of terns in San Diego Bay was estimated at 871-873 pairs or approximately 18-19 percent of the statewide population and in 2006 it was estimated at 1,611-1,638 pairs, or approximately 22-23 percent of the statewide population. Recently, least terns have nested at seven to nine locations around San Diego Bay. As listed in USFWS (2006a), these are North Delta Beach, South Delta Beach, NAB ocean beaches, NASNI, as well as Lindbergh Field, the South Bay National Wildlife Refuge (formerly Western Saltworks), Chula Vista Wildlife Reserve, D Street Fill/Sweetwater Marsh, and Silver Strand State Beach (a single record of a pair in 2004).

**Table 3.12-3: San Diego Bay and Naval Base Coronado (NBC) California Least Tern Pair and Occupied Site Information**

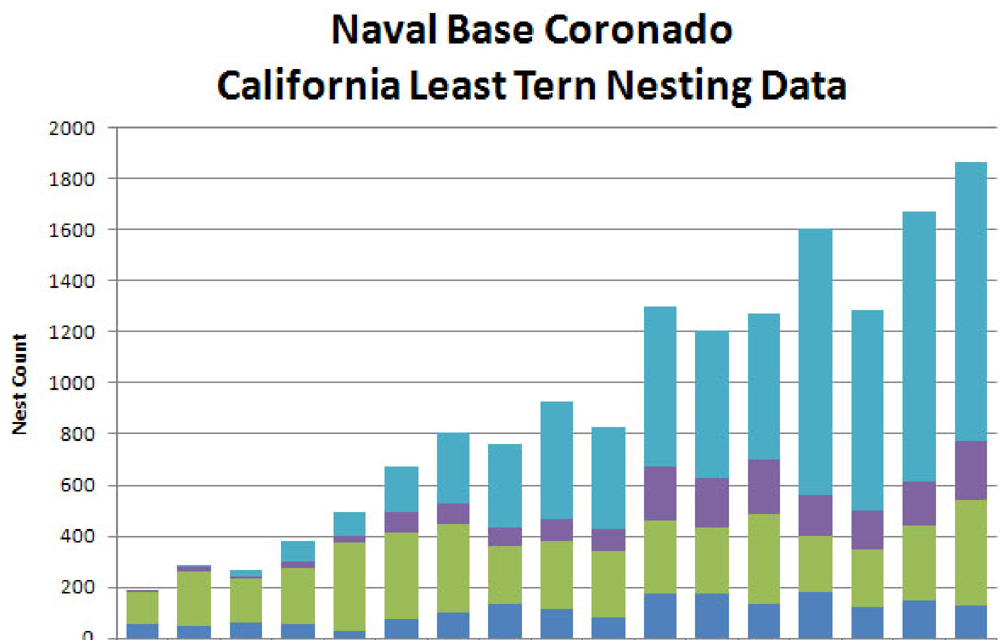
| | San Diego Bay California least tern pairs | | | NBC California least tern pairs | |
|---|---|---|---|---|---|
| **Year** | **Minimum (percent of statewide)** | **Maximum (percent of statewide)** | **San Diego Bay Occupied Sites[Δ]** | **Minimum (percent of statewide)** | **Maximum (percent of statewide)** |
| 2000 | 757 (17) | 765 (16) | 7 (a,c,d,e,f,g,i) | 669 (15) | 669 (14) |
| 2001 | 871 (19) | 873 (18) | 8 (a,b,c,d,e,f,g,i) | 769 (16) | 769 (16) |
| 2002 | 705 (20) | 712 (20) | 8 (a,c,d,e,f,g,h,i) | 605 (17) | 605 (17) |
| 2003 | 1308 (20) | 1331 (19) | 8 (a,c,d,e,f,g,h,i) | 1119 (17) | 1119 (17) |
| 2004 | 1245 (20) | 1294 (19) | 9 (a,c,d,e,f,g,h,i,j) | 1041 (16) | 1041 (15) |
| 2005 | 1375 (20) | 1440 (20) | 8 (a,c,d,e,f,g,h,i) | 1135 (17) | 1135 (15) |
| 2006 | 1611 (23) | 1638 (22) | 8 (a,c,d,e,f,g,h,i) | 1356 (19) | 1356 (19) |
| 2007 | 1452 (22) | 1503 (22) | 8 (a,c,d,e,f,g,h,i) | 1149 (17) | 1149 (16) |
| 2008 | 1813 (26) | 2038 (26) | 8 (a,c,d,e,f,g,h,i) | 1573 (22) | 1795 (23) |

* Totals do not include nesting from the Tijuana Estuary National Estuarine Research Reserve site. Statewide and some NBC data from least tern annual reports. NBC data also included from Navy/Copper unpublished data.

Δ Occupied Sites (data from California least tern Annual Reports):

| | | | | | |
|---|---|---|---|---|---|
| a | Lindbergh Field | b | Former Naval Training Center | c | NASNI |
| d | Delta Beach North | e | Delta Beach South | f | NAB Ocean |
| g | D Street Fill/Sweetwater Marsh National Wildlife Refuge | h | Chula Vista Wildlife Reserve | i | South San Diego Bay National Wildlife Refuge – Saltworks |
| j | Silver Strand State Beach | | | | |

Nesting colonies have spread to almost all oceanside beaches along NAB where nest numbers have increased over the past decade in the same fashion as the number of tern pairs described above. The number of California least tern nests on Naval Base Coronado (NBC) lands has increased overall from 187 nests in 1993 to 1,810 nests in 2008 (Figure 3.12-9). Nesting data records for each location on Navy managed beaches is used to estimate incidental take as well as to gauge the success of various management strategies. The number of mated pairs on NAB from 1990 to 2008 showed an overall increasing trend. Over the same period of time the number of fledglings produced by these nests varied considerably, as it has statewide.




| | '93 | '94 | '95 | '96 | '97 | '98 | '99 | '00 | '01 | '02 | '03 | '04 | '05 | '06 | '07 | '08 | '09 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NAB OCEAN SIDE BEACHES | 0 | 1 | 31 | 84 | 91 | 182 | 278 | 330 | 462 | 401 | 623 | 577 | 570 | 1047 | 782 | 1055 | 1093 |
| NAB DELTA BEACH SOUTH | 8 | 18 | 1 | 21 | 25 | 80 | 80 | 71 | 81 | 84 | 216 | 195 | 215 | 155 | 156 | 174 | 235 |
| NAB DELTA BEACH NORTH | 127 | 210 | 177 | 224 | 349 | 337 | 344 | 229 | 271 | 257 | 285 | 263 | 351 | 223 | 224 | 295 | 413 |
| NASNI RUNWAY 11 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 4 | 0 | 0 |
| NASNI MAT SITE (1977 = 13) | 52 | 51 | 60 | 53 | 27 | 77 | 102 | 133 | 113 | 83 | 172 | 172 | 134 | 180 | 119 | 146 | 125 |
| TOTAL | 187 | 280 | 269 | 382 | 492 | 676 | 804 | 763 | 927 | 825 | 1299 | 1207 | 1270 | 1605 | 1285 | 1670 | 1866 |

**Figure 3.12-9: California Least Tern Nest Numbers from Naval Base Coronado Nesting Sites**

The Recovery Plan (USFWS Revised 27 Sept 1985) identified the population size, distribution, secure nesting site numbers, and reproductive rates necessary for recovery of the California least tern. The Recovery Plan states that for delisting, the terns must have an annual rangewide breeding population of at least 1,200 pairs. This goal has been far surpassed; breeding pairs throughout the range are currently estimated at over 7,000. In 2008, the following were statewide statistics: fledglings 2,254- 2,573; fledgling/pair 0.29-0.37; 8223-8226 nests, 6998-7698 pairs; 31 data sites at 56 locations. In 2006, the USFSW initiated a five year review which has resulted in a recommendation to delist the species to Threatened under the Endangered Species Act. Without continued intensive management of least tern sites, the USFWS anticipates that the threats of habitat loss and predation would reverse the population recovery that has been seen since the species was listed. Current recommendations for future actions include revisiting and revising management goals and recovery criteria. The USFWS recognizes that the management goals and recovery criteria identified in the 1985 Recovery Plan are outdated and that the plan needs to be revised (USFWS 2006).

**Population Viability Analyses and Metapopulation Dynamics of the California Least Tern**

Population modeling conducted in support of the current revision of the Recovery Plan indicates that the recovery objectives set in 1985 are insufficient to assure a viable population for 50 years (described in Appendix to USFWS 2005 Biological Opinion 3452.3), and based on intensive data sets from Venice Beach and Santa Margarita cited by the USFWS in that Opinion. The number of breeding pairs is predicted to decline with mild supplemental disturbance and normal El Nino/Southern Oscillation (ENSO) frequency unless the starting number of pairs is at least 3,000. When starting with the number of breeding pairs at 7,000 (close to the current level), over 25 percent losses coupled with overly-frequent ENSO events were the only circumstance that resulted in a decline in numbers after 50 years. Once the population drops to 1,000 pairs state-wide (close to the Recovery Plan goal), recovery is slow and uncertain.

The model simulated seriously poor performance in an ENSO year that occurred at Venice Beach in 1982-1983. This “bad year” could represent attenuated survival and productivity or poor performance years for other reasons, such as predation. The probability of an exceptionally poor year was varied from between one in 12 years to one in five years. At the same time, supplemental disturbance was forced to vary in three categories: None (maintaining current conditions), Moderate Losses (10 percent), and Substantial Disruption (25 percent). The authors believed the central parameters to be the more realistic (exceptionally poor year about once in seven years, and moderate supplemental disturbance level).

At high levels of disturbance, there was poor performance across the board at high ENSO levels or low starting populations. With moderate disturbance and ENSO levels, populations of 4,000 or more pairs state-wide appear to have at least 87 percent chance of growth over a 50-year period.

The authors concluded that 4,000 pairs is a safe population based on the model, and an additional 1,000 pairs would provide a margin to account for the unknown. Thus, the number of 5,000 pairs is considered sufficiently protective to account for substantial losses from extreme events, plus the added buffer for gaps in understanding or model accuracy, or sources of unknown disruption.

Akcakaya et al. (2003) modeled metapopulation dynamics of the California least tern. The model uses survival rates, fledgling productivity, and inter-colony movement to derive a variety of simulated frequencies of exceptionally unproductive years and levels of disruptive disturbance. Within each population (cluster of nearby sites), the model includes age structure, annual changes in survival and fecundity, regional catastrophes such as strong ENSOs, and local catastrophes (reproductive failure due to predation). The modelers, using state-wide data 1980-1998 assumed a bimodal distribution of fledglings per pair, with a very high rate of zero fecundity years. These were modeled as random local catastrophes.

The survival rate from hatchling to fledgling was based on Venice Beach data from 1981 to 1984 (Massey et al. 1992) and an interior site (Smith and Renken 1993). The resulting productivity was 0.6237 for normal years and 0.27 for ENSO years. The modelers used a wide range of vital rates because of the high uncertainty, using maximum and minimum plausible values. They modeled density dependence and a ceiling carrying capacity of a site assuming a range of between 1.5 and 2.5 times the maximum number of individuals, respectively.

The model predicted a continuing population increase with a low risk of substantial decline over the next 50 years. Pessimistically, the model was sensitive to assumptions about fecundity and survival and resulted in predictions of a high rate of decline but a low probability of extinction. The number and location of sites selected for focused management influenced how effective predator management outcomes were.

The authors provide reasons why their matrices may underestimate growth rates. First, the data sets used included a very strong ENSO year 1982-1983. Second, the observed growth rate in the last decade or so was much higher than the predicted. Third, fledgling production numbers from the field, even from experienced observers, are likely underestimates (Massey 1988; Thompson and Slack 1984). These models employ data up until about 1998. There are approximately ten more years of data currently available.

#### 3.12.1.3.2 Western Snowy Plover

The western snowy plover is listed by the USFWS as threatened and by the California Department of Fish and game (CDFG) as a species of special concern (USFWS Recovery Documents: Final Recovery Plan August 13, 2007 and Five-Year Review May 31, 2006). 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). Larger concentrations of breeding birds occur in the south rather than the north, suggesting that the center of the plover’s coastal distribution lies closer to the southern boundary of California (Page and Stenzel 1981). Prior to 1970, snowy plovers bred at 53 locations along coastal California (Page and Stenzel 1981). Presently, breeding occurs at only 20 locations representing a 62 percent decline in breeding sites. The greatest losses of habitat have occurred in southern California, in some of Orange County and all of Los Angeles County. In all of these areas, the plovers' absence can be correlated with industrial or residential development and/or heavy recreational use of former beach nesting areas (Page and Stenzel 1981). The plover is a common winter migrant, winter visitor, and a declining, local resident in San Diego County (Unitt 2004, 1984).

The average life span of western snowy plovers is estimated at 2.7 years, although a bird of 15 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, Patton 1994b).

Collated information concerning the rangewide status of the snowy plover is incomplete, due to the fact that the species does not nest in discrete, intensively managed colonies. Definitive information concerning nest numbers and breeding success is unavailable for many sites. The predominant method available to assess the U.S. range-wide status of this species is the "window survey" technique, which is conducted in both summer and winter months. The window survey, while uninformative in terms of breeding success and precise numbers, gives an overview of how the species is faring on a rangewide basis. Figure 3.12-10 displays state of California breeding season window survey results only for years when coast-wide surveys were performed (USFWS 2007b) and are not connected in nonsequential years due to lack of plover information.

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). Other areas used by nesting snowy plovers include dredge spoil fill, dry salt evaporation ponds, airfield ovals, and salt pond levees (Page and Stenzel 1981; US Navy 2004; Widrig 1980; Wilson 1980). These cited studies observed snowy plovers moving between salt pans, tidal flats, and beaches indicating these areas function together in providing habitat for the species.

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).

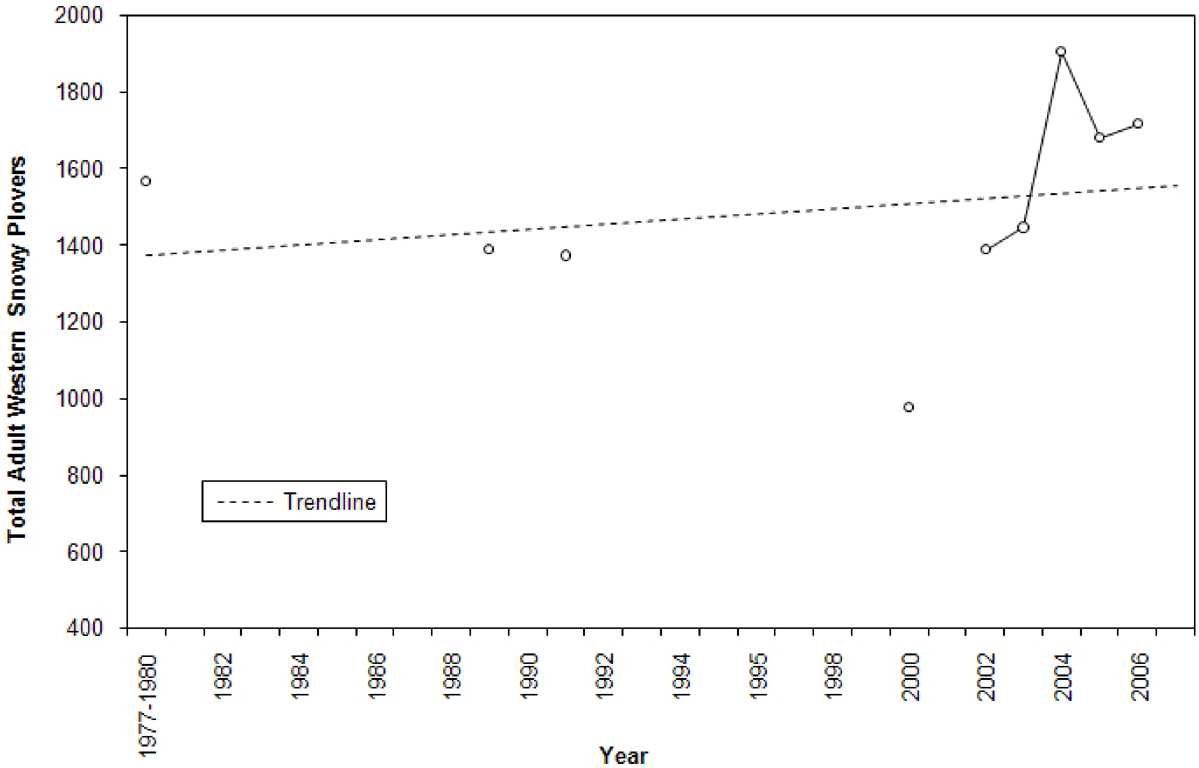



**Figure 3.12-10: Total Adult Western Snowy Plovers Recorded for the California Coast during Breeding Season Window Surveys**

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 at Mono Lake where predatory pressure is high, while 20 nests per 15 acres 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). Snowy plovers are sometimes found nesting in similar habitats as the least tern, such as occurs at Batiquitos Lagoon (Welchell and Keane 1998), Camp Pendleton (Powell et al. 1996), and the SSTC. Of these sites mentioned, only the SSTC is a Navy site.

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 6 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.

Locally, the species is declining because of increased human disturbance, loss of feeding and nesting areas, and increased predation by birds and mammals. The western snowy plover has been described as one of the "scarcest and most threatened breeding birds in San Diego County" (Unitt 2004). Window surveys of this species between 1995 and 1998 put San Diego County's breeding population between 240 and 325 individuals that are concentrated in Camp Pendleton and the Silver Strand (Powell et al. 2002). In 2006, 32 western snowy plovers were discovered injured, sick, or dead in San Diego County; at least 6 were later released. Due to this unknown cause of mortality in adult snowy plovers in and around San Diego Bay, the Navy supports any studies and efforts by the USFWS to determine the cause of the mortality. Based on breeding season window survey data collected between 1977 and 1989, the breeding population of snowy plovers in California, Oregon, and Washington experienced a 17 percent decline (Page et al. 1991). Using the same techniques, the breeding population in California declined from an estimated 1,565 adults in 1980 (Page and Stenzel 1981) to 1,386 adults in 1989, with a 55 percent decline occurring in north San Diego County and a 41 percent decline at San Diego Bay (Page et al. 1991). Between 1991 and 2004, however, the snowy plover population increased rangewide. Most areas suffered a decline between 2006 and 2007, including San Diego County, but numbers were higher in 2008 statewide, in San Diego County, and on SSTC properties. An unknown cause of mortality in adult snowy plovers took place in and around San Diego Bay that began in 2005. In 2006, 11 adult snowy plovers were found sick and 21 dead from unknown causes in the County of San Diego, including 16 from the oceanside beaches of NAB Coronado. There were 4 snowy plovers found dead at NBC in 2007, 3 adults and 1 fledgling. There was only 1 snowy plover found dead on NBC in 2008, an adult. The data are compiled by various biologists in San Diego County with assistance from the Navy and provided through snowyplover@yahoogroups.com and http://tech.groups.yahoo.com/group/snowyplover/.

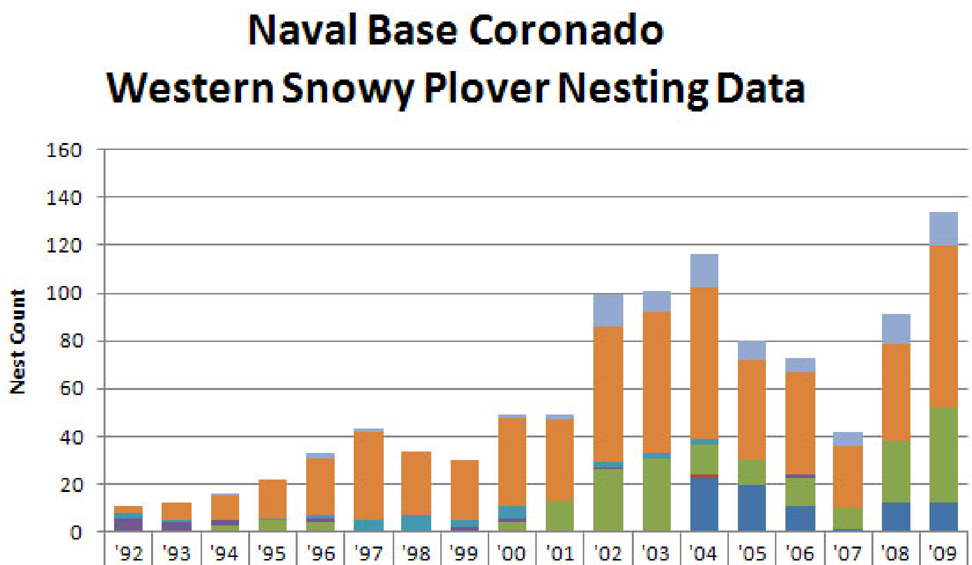
Human disturbances include unintentional disturbance and destruction of eggs and chicks, off-road vehicle use, horseback riding, and beach raking. Intensive beach use by humans has resulted in abandonment of nesting sites, and reductions in nesting density and nesting success. When coupled with positive management, some colonies have increased in size despite concurrent human use of nesting beaches (USFWS 2003 BO 1-03-F-3452.1). Few undisturbed beaches remain in San Diego County. In the few instances where human activity in snowy plover nesting areas has been precluded either through area closures or by natural events, nesting success has improved.

Areas which receive significant off-road vehicle activity support lower densities of plover nests (Page and Stenzel 1981). Powell and Collier (1994) reported a shift in beach usage by snowy plovers from areas of heavy vehicular traffic to more protected sites. Direct mortality to snowy plovers as a result of vehicular activity on beaches has been documented (Copper 1997b; Persons 1994). Research has shown a decrease in piping plover chick survivorship with as little as 10 vehicular passes per day (Melvin et al. 1994). The snowy plover's flightless young are particularly vulnerable to being run over or trampled since crouching in depressions, such as footprints and tire tracks, appears to be a behavioral characteristic when the young feel threatened (James et al. 1992). Vehicle closure on a portion of Pismo Beach, California, led to an eight-fold increase in the nesting plover population (Radasky et al. 2003).

Human disturbance can also interfere with normal snowy plover behavior. Disturbances to incubating adults can leave nests exposed to extreme temperatures resulting in inviable eggs or blowing sand that buries the eggs. Snowy plover chicks that are separated from their attending adult as a result of human disturbance or predators may become more susceptible to hypothermia since young chicks are unable to thermoregulate. It has been shown that increased human disturbance forces piping plover chicks (*Charadrius melodies*), an east coast species with habitat requirements very similar to the snowy plover, to expend more energy avoiding disturbances and less time foraging (Flemming et al. 1987). Frequently disturbed piping plover chicks fed less often and at a reduced rate resulted in fewer chicks surviving to 17 days in areas heavily disturbed by humans (Flemming et al. 1987). However, there are levels of disturbance that have been documented to occur within the NAB training areas that appear not to have significantly affected snowy plover nesting efforts. In 2001, five snowy plover nests were established in beach area Red 1. The nests were established on, or about, May 6, 18, and 23, June 12, and July 3, 2001. In spite of training occurring almost daily in beach lane Red 1 throughout the nesting season, all five nests successfully hatched three eggs each (Copper 2002). The fate of the fledglings was not determined, but the numbers on NBC beaches increased in 2002, 2003, and 2004 despite training activities concurrent with nesting efforts. Increases in snowy plover numbers on co-used beaches are largely due to management efforts to reduce impacts to nest sites. For example, the Navy marks a boundary around nest sites to preclude trampling or vehicular disturbance to nests. This conservation measure has resulted in successful hatching of nests in areas where training occurs.

The Navy began managing the western snowy plover at its properties in San Diego Bay in 1992, prior to the listing of the species as federally threatened in 1993. Nest numbers on NBC lands for the plover have shown an overall increase from 11 in 1992 to 42 in 2007, then 91 in 2008 (Copper 2008; Figure 3.12-11).

In recent years the snowy plover nested in three main areas: NASNI, the oceanside training lanes of NAB, and the beaches of SSTC-S. The snowy plover's nesting colonies are less dense than those of the California least tern and are more sporadically distributed. There were 80 snowy plover nests documented in 2005 on NBC, representing a decrease of 32 percent from the 116 snowy plover nests present in 2004. Nesting in 2005 remained more or less steady in 2006 when there were 73 nests documented on NBC, and when mortality of many adults was documented due to unknown causes. Comparing Navy nesting plover numbers to regional data is difficult because the Navy records nests while much of the available state- and countywide data are available only for adults detected via breeding-season window surveys. These window survey data indicate that in San Diego County the Navy is second only to the Marine Corps at Camp Pendleton in plover numbers. Between 2005 and 2008 the Navy’s San Diego Bay properties held between 14 and 28 percent of the plovers surveyed in San Diego County. Restriction of the beaches to primarily training use (rather than recreational access), predator control efforts, as well as nest buffers and training lane restrictions help to maintain these numbers.




| | '92 | '93 | '94 | '95 | '96 | '97 | '98 | '99 | '00 | '01 | '02 | '03 | '04 | '05 | '06 | '07 | '08 | '09 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NRRF | 0 | 0 | 1 | 0 | 2 | 1 | 0 | 0 | 1 | 2 | 13 | 9 | 14 | 8 | 6 | 6 | 12 | 14 |
| NAB OCEAN BEACHES | 3 | 7 | 10 | 16 | 24 | 37 | 27 | 25 | 37 | 34 | 57 | 59 | 63 | 42 | 43 | 26 | 41 | 68 |
| NAB DELTA BEACH SOUTH | 2 | 1 | 0 | 1 | 1 | 5 | 7 | 3 | 5 | 0 | 2 | 2 | 2 | 0 | 0 | 0 | 0 | 0 |
| NAB DELTA BEACH NORTH | 6 | 4 | 2 | 0 | 2 | 0 | 0 | 2 | 2 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| NASNI OCEAN | 0 | 0 | 3 | 5 | 4 | 0 | 0 | 0 | 4 | 13 | 26 | 31 | 13 | 10 | 12 | 9 | 26 | 40 |
| UNKNOWN | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| NASNI AIRFIELD | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 23 | 20 | 11 | 1 | 12 | 12 |
| TOTAL | 11 | 12 | 16 | 22 | 33 | 43 | 34 | 30 | 49 | 49 | 99 | 101 | 116 | 80 | 73 | 42 | 91 | 134 |

Source: Copper 2007

**Figure 3.12-11: Distribution of Western Snowy Plover Nests by Location from 1992 to 2008.**

Since the western snowy plover often re-nests multiple times in a season, the number of maximum active nests at one time can give a better picture of the actual number of plovers supported at a site. Table 3-12.4 displays maximum active nest numbers for Navy-controlled nesting sites in San Diego Bay. The “Total NBC” and “Total SSTC oceanside” columns do not add up across sites because re-nesting by the same plovers occurred at separate sites. This total maximum active nest number gives a conservative approximation for the number of snowy plovers supported on SSTC oceanside and NBC total beaches.

**Table 3-12.4: Summary of Snowy Plover Maximum Active Nest at One Time Numbers, NBC 1999-2009**

| Year | North Island | Delta Beach North | Delta Beach South | SSTC-N Ocean | SSTC-S | Total SSTC Oceanside* | Total NBC* |
|---|---|---|---|---|---|---|---|
| 1999 | 0 | 2 | 2 | 11 | 0 | | 12 |
| 2000 | 2 | 2 | 3 | 13 | 1 | | 17 |
| 2001 | 5 | 0 | 0 | 13 | 2 | | 16 |
| 2002 | 12 | 1 | 2 | 20 | 5 | | 33 |
| 2003 | 13 | 0 | 1 | 20 | 5 | 22 | 33 |
| 2004 | 12 | 0 | 1 | 20 | 5 | 24 | 32 |
| 2005 | 7 | 0 | 0 | 15 | 3 | 18 | 21 |
| 2006 | 7 | 1 | 0 | 19 | 3 | 22 | 24 |
| 2007 | 3 | 0 | 0 | 9 | 3 | 11 | 13 |
| 2008 | 10 | 0 | 0 | 14 | 4 | 16 | 26 |
| 2009 | 15 | 0 | 0 | 19 | 4 | 22 | 33 |

Source: Copper 2009, unpublished data

* Maximum active nests at each site cannot be added together to determine the maximum active nests at one for all of SSTC Oceanside or NBC because re-nesting by the same plovers occurred at separate sites.

The Recovery Plan criteria set a target of 95 breeding adults for Silver Strand sites (NASNI, NAB and Naval Radio Receiving Facility [NRRF]) plus Silver Strand State Beach and portions of Coronado. The current method used by the Navy for determining breeding pairs is maximum nests at one time. This method is used because it is an objective count that does not require that an observer track whether a breeding pair has established more than one nest in a season. If one assumes that 95 breeding adults correlate to roughly 48 pairs necessary for the Silver Strand beaches, this implies that the count of maximum nests at one time will be at least 48 nests; on average over the years, across all the Silver Strand to meet recovery goals. This goal has not been met based on Navy site reports. It is unknown whether other parcels contribute sufficiently to achieving the target because the number of breeding adults is not counted elsewhere. As an index, San Diego Bay Navy total adults observed during the rangewide window surveys have varied: 25 (2005); 66 (2006); 20 (2007); and 56 (2008) (see http://www.fws.gov/arcata/es/birds/WSP/documents/2006-07WinterWindowSurveyfinalrange-wide.pdf).

### 3.12.1.3.3 Light-Footed Clapper Rail

The light-footed clapper rail is listed by both the USFWS (35 FR 16047 16048 13 October 1970) and the CDFG as endangered under the California Endangered Species Act. The light-footed clapper rail is currently found from Carpinteria in Santa Barbara County to San Quentin, Baja California, Mexico (USFWS 1985). Historically it was found further north (AOU 1957) due to a more contiguous system of marshes than currently exists. This species lives, nests, and forages entirely within its preferred habitat of large estuaries with salt marsh habitat dominated by cordgrass (*Spartina foliosa*) and pickleweed (*Salicornia* spp.) (Jorgensen 1979). Clapper rails require cordgrass of the lower marsh habitat for nesting, and an abundance of intertidal marine invertebrates for their food supply (Massey et al. 1984; Zedler 1993). Light-footed clapper rails have declined dramatically in recent decades due to destruction of its salt marsh habitat (Garrett and Dunn 1981, Macdonald et al. 1990). This destruction and fragmentation of their environment by urban development leaves the birds in isolated populations, increasing the chance of extirpation of the colony (Hoffman 2005).

The rail is a brown marsh bird with long legs; short, upturned tail; long bill; and barred flanks. It is not a strong flyer and does not seasonally migrate. It will feed on insects, small fish (including larval fish), and some plant material. Zembal et al. (1989) showed that this species roosts in dense vegetation during the day and are most active at dawn and dusk. This 1989 study also showed that the minimum home range of this species was from 0.36 to 1.66 hectare and its maximum movements were restricted to about 1,350 feet. Adjacent middle and upper marsh and upland transition habitat is important as a safe area during very high tides, large storms, or as a temporary refuge if lower marsh habitats become degraded (Zembal 1993). Light-footed clapper rails tether their nests with cordgrass, so that the nests do not wash away or become inundated during high tide (Massey and Zembal 1980). Nests are usually built of cordgrass stems, though may also include pickleweed, reed stems, salt grass (*Distichlis spicata*; Massey et al. 1984). Clapper rails have been documented nesting in cattails (*Typha latifolia*), and cordgrass is also used to camouflage the nest (Massey et al.1984; Zedler 1993). They generally lay six eggs between March and August (Massey and Zembal 1980), and the chicks hatch from April to June (Unitt 1984) though pairs remain on aggressively defended territories throughout the year (Zembal et al. 1989). Both sexes incubate and care for the young, which are precocial and nidifugous (leave nest short time after hatching; Meanly 1985). Once the young leave the nest they immediately follow the adults: parental care lasts for six to seven weeks (Adams and Quay 1958; Johnson 1973) and the young can fly by nine or ten weeks (Schmidt and McLain 1951, Adams and Quay 1958; Meanley 1985). A pair may mate again after the fledging of the first brood (Blandin 1963). Dispersion and movement of juveniles is poorly understood due to limited evidence and in 20-plus years of banding studies there has been only two light-footed clapper rails ever documented outside the wetland in which it was banded (Zembal et al. 2005; Zembal et al. 1985).

The entire southern California population decreased from 277 pairs in 1984 to 142 pairs in 1985, partly due to tidal closure of the Tijuana Estuary (Zedler 1992). Statewide, an estimated 325 light-footed clapper rail pairs, nesting in 14 wetlands, were known to exist in 1996 (DoN 2002). Tidal inundation and predation by raptors and mammals are the main causes of nest failure (Macdonald et al. 1990). Large storm events may destroy nests and make the habitat unsuitable for clapper rail use (Zedler 1993). Lower marsh habitats can also be damaged from watershed runoff and made unsuitable for nesting. The lack of nesting cover due to habitat loss is a major concern for this species (Massey et al. 1984 and Schmidt and McLain 1951). In the absence of habitat degradation and major predation pressures, high tides are the main threat to nesting success (Adams and Quay 1958; Meanly 1985; Massey et al. 1984).

The clapper rail occurs on two NBC installations, Naval Outlying Landing Field (NOLF), Imperial Beach, which is outside of the ROI, and NRRF in the marsh on the bay side (South Bay Marine Biological Study Area), bounded on the west by State Route 75 and to the south by a salt pond levee. NRRF has historically held zero to five pairs of rails since surveying began in 1980, and has held at least one rail pair 18 out of 26 survey years (Zembal et al. 2007; Hoffman 2007) at this same location. While the NRRF population does not contribute significantly to the overall population, it provides an insurance against extirpation and a preservation of genetic diversity (Hoffman 2007; Zembal et al. 2007). The population at Tijuana Slough National Wildlife Refuge (TSNWR) doubled between 1980 and 1983 due to the restoration, enhancement, and management of the area. Due to sedimentation of the Tijuana Estuary, the population crashed in 1985. An ocean inlet was created by the USFWS to keep the lagoon open, but sedimentation remains a problem and the inlet must be excavated every year, especially after heavy rainfall during winter. The population recovered in 1986. During this recovery period there was an increase in noise over the marsh by helicopter overflights. This increased noise may have disrupted communication signals of birds as well as how they detect predators: in 1989 an unusually high number of unpaired rails were located, indicating loss of one partner of the pairs. With cessation of helicopter flights over the marsh, and tighter restrictions on human intrusions through the area, the population recovered by 1995. The restoration of the marsh also contributed to the successful population of clapper rails (Hoffman 2005).

Since 1994, a single unpaired clapper rail was detected in 1997 and one pair in 1998. No clapper rails were detected between 1999 and 2004. During focused surveys in July 2005, one adult clapper rail with a downy chick was detected at the bayside marsh at the South Bay Marine Biological Preserve (about 27 acres) on the west shore of San Diego Bay at NRRF bounded on the west by State Route 75 (Hoffman 2007). Another pair was detected in 2006 (Zembal et al. 2007). Hoffman (2005) stated that in 2005 the population at the TSNWR was the second largest in California. The first was the population at Upper Newport Bay Ecological Reserve. This sporadic appearance and disappearance is common in this species life history, and at NRRF may be partially due to the ease in which the rail can be targeted by predators in this marginal habitat fragment. The Upper Newport Bay Ecological Reserve is also now connected to a protected upland, which may serve as a buffer to the species.

### 3.12.1.4 Other Special Status Birds

A list of special status birds documented in or near the project area is provided in Table 3.12-5. Location records are shown Section 3.11 (Terrestrial Biological Resources) on Figures 3.11-4 through 3.11-6. The list of special status avian species includes Federal Species of Concern, State of California Endangered, California Special Concern species, and CDFG fully protected species. The list also contains species on the Audubon Watch List and Birds Species of Conservation Concern (USFWS 2008), as well as those covered in the City of San Diego's Multiple Species Conservation Plan.

**Table 3.12-5: Special Status Avian Species Documented in the ROI**

| Common Name (*Scientific Name*) | Status* |
|---|---|
| American oystercatcher (*Haematopus canadensi*) | HC |
| American peregrine falcon (*Falco peregrinus anatum*) | Recovered, BCC, CE, CFP, MSCP |
| American white pelican (*Pelecanus erythrorynchos*) | CSC |
| ashy storm-petrel (*Oceanodroma homochroa*) | CSC, BCC |
| bald eagle (*Haliaeetus leucocephalus*) | FT, CE, CFP, BEPA, MSCP, RSD |
| Barrow's goldeneye (*Bucephala islandica*) | CSC, RSD |
| Belding's savannah sparrow (*Ammodramus sandwichensis beldingi*) | CE, MSCP |
| black oystercatcher (*Haematopus bachmani*) | BCC, HC |
| black skimmer (*Rynchops niger niger*) | BCC, CSC |
| black storm-petrel (*Oceanodroma melania*) | CSC |
| black turnstone (*Arenaria melanocephala*) | BCC, HC |
| burrowing owl (*Athene cunicularia hypugaea*) | BCC, CSC, MSCP |
| California brown pelican (*Pelecanus occidentalis californicus*) | Recovered, CE, CFP, MSCP |
| California least tern (*Sternula antillarum browni*) | FE, CE, CFP, MSCP |
| California rufous-crowned sparrow (*Aimophila ruficeps canescens*) | MSCP |
| Canada goose (*Branta canadensis*) | MSCP |
| common loon (*Gavia immer*) | CSC |
| Cooper's hawk (*Accipiter cooperii*) | MSCP |
| dunlin (*Calidris alpine arcticola/pacifica*) | HI/HC |
| elegant tern (*Sterna elegans*) | BCC, MSCP |
| ferruginous hawk (*Buteo regalis*) | MSCP |
| fulvous whistling-duck (*Dendrocygna bicolor*) | CSC, RSD |
| golden eagle (*Aquila chrysaetos canadensis*) | CFP, BEPA, MSCP |
| gull-billed tern (*Sterna nilotica vanrossemi*) | BCC, CSC |

**Table 3.12-5: Special Status Avian Species Documented in the ROI (Continued)**

| Common Name (*Scientific Name*) | Status* |
|---|---|
| harlequin duck (*Histrionicus histrionicus*) | CSC |
| large-billed Savannah sparrow (*Ammodramus sandwichensis rostratus*) | CSC, MSCP |
| Lawrence's goldfinch (*Carduelis lawrencei*) | BCC |
| least bittern (*Ixobrychus exilis hesperis*) | CSC |
| light-footed clapper rail (*Rallus longirostris levipes*) | FE, CE, CFP, MSCP, RSD |
| loggerhead shrike (*Lanius ludovicianus*) | CSC, BCC |
| long-billed curlew (*Numenius americanus*) | BCC, MSCP, HI |
| marbled godwit (*Limosa fedoa fedoa*) | BCC, HC |
| mountain plover (*Charadrius montanus*) | BCC, CSC, MSCP, RSD |
| northern harrier (*Circus cyaneus hudsonius*) | CSC, MSCP |
| prairie falcon (*Falco mexicanus*) | BCC |
| purple martin (*Progne subis subis*) | CSC, RSD |
| red knot (*Calidris canutus roselaari*) | BCC, HC |
| reddish egret (*Egretta rufescens dickeyi*) | MSCP |
| ruddy turnstone (*Arenaria interpres*) | HC |
| sanderling (*Calidris alba*) | HC |
| short-billed dowitcher (*Limnodromus griseus*) | BCC, HC |
| short-eared owl (*Asio flammeus flammeus*) | CSC |
| surfbird (*Aphriza virgata*) | HC |
| Swainson's hawk (*Buteo swainsoni*) | CT, BCC, MSCP |
| tricolored blackbird (*Agelaius tricolor*) | CSC, BCC, MSCP |
| Vaux's swift (*Chaetura vauxi vauxi*) | CSC |
| western sandpiper (*Calidris mauri*) | HC |
| western snowy plover (*Charadrius alexandrinus nivosus*) | FT, CSC, MSCP, HI |
| whimbrel (*Numenius phaeopus hudsonicus*) | BCC, HI |
| white-faced ibis (*Plegadis chihi*) | MSCP |
| white-tailed kite (*Elanus leucurus*) | CFP |
| Wilson's phalarope (*Phalaropus tricolor*) | HC |
| wood stork (*Mycteria americana*) | CSC |

Status derived from the USFWS Birds of Conservation Concern, 2008; CDFG Special Animals Lists, July 2003; and the CNPS's Inventory of Rare and Endangered Plants of California, 2001: FE=Federal Endangered; FT=Federal Threatened; FSC=Federal Species of Concern; C=Candidate (USFWS); BEPA=Bald Eagle Protection Act; CE=State Endangered; CT=California Threatened;
CSC=California Special Concern Species; CFP=CDFG fully protected=Species may not be taken without permit from Fish and Game Commission; BCC watch list= Birds of Conservation Concern for California region (USFWS 2002); Audubon=National Audubon Society Watch List species; MSCP = Covered under the City of San Diego Multiple Species Conservation Plan; RSD = Rare in San Diego County; US Shorebird Conservation Plan (2004) High Priority Shorebirds: HC = High Concern, HI = Highly Imperiled
*Other species with some sensitive status but not considered a management concern in San Diego Bay: black-crowned night heron (Audubon Watch List); California black rail (RSD, CT) (currently extirpated). Cooper's hawk (upland)

The tables that follow present abundance estimates for special status birds from various sources, as close as possible to the ROI, as described, listed in Table 3.12-6. Information from maps and text was estimated in a consistent manner to fit the particulars of each table when numerical records were not readily available. The methodology of the research producing this data varies among studies. In all cases, the chosen source was deemed most appropriate for the information it provided. This information is compiled so that the effects analysis can include an estimate of the effect to local and total population levels of migratory birds.

**Table 3.12-6: Habitat Usage and Abundance Estimates for Special Status Birds Observed in the ROI**

| **Common Name** ***(Scientific Name)*** | **Habitat Usage/ Seasonality[1]** | **Count[2] (Local region)** | **Total Observed (San Diego Bay)[3]** | **Total Observed (NASNI / NRRF)[4]** | **Pop. Estimate[5] (National)** |
|---|---|---|---|---|---|
| American oystercatcher (*Haematopus palliatus*) | i b / ‡ | < 5 | 3 | - / - | 7,500 |
| American Peregrine Falcon (*Falco alexandrin anatum*)* | i b e m | < 5 | 39 | 1 / - | - |
| American white pelican (*Pelecanus erythrorynchos*) | o i b e / W | Max ct. 20-100 | 93 | - / - | - |
| Ashy Storm-petrel (*Oceanodroma homochroa*)* | o i | < 10 | - | - / - | - |
| Barrow's Goldeneye (*Bucephala islandica*) | o i b / W | < 5 | 3 | - / - | - |
| Belding's Savannah Sparrow (*Ammodramus sandwichensis beldingi*) | b e m | Max ct. 100-2000 | 746 | - / 65 | - |
| Black Oystercatcher (*Haematopus bachmani*)* | i b / ‡ | <10 | 22 | - / - | 8,900 |
| Black Skimmer (*Rynchops niger niger*)* | i b e | Max ct. 25-200 | 1,282 | 2 / 3 | - |
| Black Storm-Petrel (*Oceanodroma melania*) | o i / S | < 2000 | - | - / - | - |
| Black Turnstone (*Arenaria melanocephala*)* | o i b / W | Max ct. 50-100 | 567 | 44 / 8 | 80,000 |
| Burrowing Owl (*Athene cunicularia hypugaea*) | c g | Max ct. 7 | 2 | 8 / - | 618,000 |
| California Brown Pelican (*Pelecanus occidentalis californicus*) | o i b e / B W | Max ct. 150-400 | 10,319 | 311 / 41 | - |
| California Gull (*Larus californicus californicus*) | o i b e / W | Max ct. 150-400 | 5608 | 16 / - | - |
| California Horned Lark (*Eremophila alpestris actia*) | g | Max ct. 50-175 | 1,741 | 37 / 35 | - |
| California Least Tern (*Sternula antillarum browni*) | i b / B | 100-250 pairs | 1,108 | 2 / 3 | |
| California Rufous-crowned Sparrow (*Aimophila ruficeps canescens*) | c g | 0.5 birds/hour | - | - / - | - |
| Canada Goose (*Branta canadensis*) | i b m / W | Max ct. 1-25 | 3 | - / - | - |
| Common Loon (*Gavia immer*) | i b e m / W | Max ct. 25-75 | 126 | - / - | - |
| Cooper's Hawk (*Accipiter cooperii*) | b c g | 3 birds/hour | 15 | 2 / 2 | 462,660 |
| Double-crested Cormorant (*Phalacrocorax auritus*) | i b e m / B W | Max ct. 100-500 | 10,088 | 54 / 43 | 750,000/ 550,000 |
| Dunlin (*Calidris alpine arcticola/pacifica*) | i b e m / W | Max ct. 100-300 | 4,900 | 4 / - | - |
| Elegant Tern (*Sterna elegans*)* | b e m / B | 10-3000 pairs | 8,740 | 457 / 3 | - |

**Table 3.12-6: Habitat Usage and Abundance Estimates for Special Status Birds Observed in the ROI (Continued)**

| **Common Name** ***(Scientific Name)*** | **Habitat Usage/ Seasonality[1]** | **Count[2] (Local region)** | **Total Observed (San Diego Bay)[3]** | **Total Observed (NASNI / NRRF)[4]** | **Pop. Estimate[5] (National)** |
|---|---|---|---|---|---|
| Ferruginous Hawk (*Buteo regalis*) | c g / W | Max count 5-10 | - | - / - | 19,750 |
| Fulvous Whistling-duck (*Dendrocygna bicolor*) | e m / S | < 5 | - | - / - | - |
| Golden Eagle (*Aquila chrysaetos alexandrin*) | e m s g | < 5 | - | - / - | 33,110 |
| Gull-billed Tern (*Sterna nilotica vanrossemi*)* | i b e m / B | 20-50 pairs | 273 | 12 / 58 | - |
| Harlequin Duck (*Histrionicus histrionicus*) | i b e / W | < 10 | - | - / - | - |
| Large-billed Savannah Sparrow (*Ammodramus sandwichensis rostratus*) | e m | < 50 | 57 | - / - | - |
| Laughing Gull (*Larus atricilla*) | i b / ‡ | < 25 | - | - / - | - |
| Lawrence's Goldfinch (*Carduelis lawrencei*)* | c g | Max ct. 1-5 | - | - / - | 130,300 |
| Least Bittern (*Ixobrychus exilis hesperis*) | e m / B | < 10 | - | - / - | - |
| Light-Footed Clapper Rail (*Rallus longirostris levipes*) | e m / B | 20-75 pairs | 1 | - / - | - |
| Loggerhead Shrike (*Lanius ludovicianus*)* | c g | 2 birds/hour | 20 | - / 15 | 3,568,310 |
| Long-billed Curlew (*Numenius americanus*) | b e m / W | Max ct. 50-150 | 709 | 1 / 4 | 20,000 |
| Marbled Godwit (*Limosa fedoa fedoa*) | b e m / W | Max ct. 200-4000 | 27,614 | 295 / 125 | 168,000 |
| Merlin (*Falco columbiarus columbiarus*) | i b e m / W | 0.15 birds/hour | 11 | - / - | - |
| Mountain Plover (*Charadrius montanus*) | c g / W | < 5 | - | - / - | - |
| Northern Harrier (*Circus cyaneus hudsonius*) | m c g | 1.5 birds/hour | 55 | - / 3 | 275,850 |
| Osprey (*Pandion haliaetus carolinensis*) | e m / W | Max ct. 10-15 | 309 | 5 / 2 | 100,236 |
| Prairie Falcon (*Falco mexicanus*)* | i b e m / W | < 5 | - | - / - | 33,950 |
| Purple Martin (*Progne subis subis*) | c g / B | < 10 | - | - / - | 9,861,437 |
| Red Knot (*Calidris canutus roselaari*)* | i b e / W | Max ct. 100-300 | 4,785 | 1 / - | 150,000 |
| Reddish Egret (*Egretta rufescens dickeyi*) | e m / W | Max ct. 5 | 36 | - / - | - |
| Ruddy Turnstone (*Arenaria interpres*) | b e m / W | Max ct. 25-50 | 657 | 2 / 3 | 20,000 |
| Sanderling (*Calidris alba*) | b e / W | Max ct. 200-300 | 13,821 | 301 / 245 | 300,000 |

**Table 3.12-6: Habitat Usage and Abundance Estimates for Special Status Birds Observed in the ROI (Continued)**

| **Common Name** ***(Scientific Name)*** | **Habitat Usage/ Seasonality[1]** | **Count[2] (Local region)** | **Total Observed (San Diego Bay)[3]** | **Total Observed (NASNI / NRRF)[4]** | **Pop. Estimate[5] (National)** |
|---|---|---|---|---|---|
| Sharp-shinned Hawk (*Accipiter striatus velox*) | c g / W | 0.3 birds/hour | 1 | - / - | 293,800 |
| Short-billed Dowitcher (*Limnodromus griseus*)* | e m / W | Max ct. 200-500 | 12,937 | - / 22 | 150,000 |
| Short-eared Owl (*Asio flammeus flammeus*) | e m g / N | Max ct. 4 | 4 | - / - | 362,700 |
| Surfbird (*Aphriza virgata*) | b e / W | Max ct. 15-45 | 290 | 4 / - | 70,000 |
| Swainson's Hawk (*Buteo swainsoni*)* | m g c / YR | < 100 | - | - / - | 341,300 |
| Tricolored Blackbird (*Agelaius tricolor*)* | e m | Max ct. 25-100 | - | - / - | - |
| Vaux's Swift (*Chaetura vauxi vauxi*) | c / W | < 5 | 28 | - / - | 411,101 |
| Western Sandpiper (*Calidris mauri*) | b e / W | Max ct. 500-5000 | 68,205 | - / 27 | 3,500,000 |
| Western Snowy Plover (*Charadrius alexandrines nivosus*) | b e | Max count 25-75 | 23 | 45 / 19 | 2,000 |
| Whimbrel (*Numenius phaeopus hudsonicus*)* | b e m / W | Max ct. 11-50 | 277 | - / 8 | 17,000 |
| White-faced Ibis (*Plegadis chihi*) | e m / W | < 25 | 31 | - / - | - |
| White-tailed Kite (*Elanus leucurus*) | m g | .25 birds/hour | 2 | - / - | 10,770 |
| Wilson's Phalarope (*Phalaropus tricolor*) | e m / S F | < 250 | 5 | - / - | 1,500,000 |
| Wood Stork (*Mycteria americana*) | e m / ‡ | < 5 | - | - / - | - |

**Habitat Usage Categories: o**-offshore; **i**-inshore; **b**-beaches, shores; **e**-estuaries, mudflats, brackish waters; **m**-marshes; **g**-grasslands; **c**-coastal scrub. **Seasonality: W**-winter; **S**-Spring; **F**-Fall; **YR**-Year Round; **B**-Breeding; ‡-not well understood; *-BCC

**Sources:** [1] Baird 1993 [2] San Diego Co. Bird Atlas, Unitt 2004 [3] SD Bay Avian Surveys, Tierra Data Inc. 2006-07 [4] NASNI-NRI-2005 (RECON 2006) / Naval Radio Receiving Facility (NRRF)-NRI-2001-02 (RECON 2004) [5] United States Shorebird Conservation Plan-2001, Partners in Flight Land Bird Population Estimates Database

The following species reports are for selected species due to their sensitivity status and their presence in the ROI.

### 3.12.1.4.1 Former Federally Listed Species

#### American Peregrine Falcon

The American peregrine falcon (*Falco peregrinus anatum*) was listed by the federal and state governments as an endangered species in 1970. On August 25, 1999, the USFWS removed the American peregrine falcon from the Endangered Species List, although it currently remains on the state endangered species list, and is considered a federal Bird of Conservation Concern (USFWS 2008). Current nesting locations include the San Diego metropolitan area and Point Loma. Preferring to hunt along larger waterways and coastal areas, particularly where large numbers of shorebirds and waterfowl congregate, peregrine falcons utilize the SSTC ROI on an occasional basis. It ranges along the West Coast of the

United States into Mexico. Peregrine falcons inhabit open coastal areas and mudflats near cliffs. Peregrine falcons forage on a variety of birds including pigeons, ducks, grebes, coots, sandpipers, other raptors, and songbirds. They will also forage on small mammals, fish, and insects. Nesting sites are typically located on high cliffs, in trees, or on man-made structures. The same nest site may be used for many years. The decline of the peregrine falcon is attributed to widespread use of the pesticide dichlorodiphenyltricholoroethane (DDT), which caused the birds to lay eggs too thin to withstand incubation (Zeiner et al. 1990). DDT was banned in the early 1970s, and a recovery program for the species began soon after.

In San Diego County, several pairs are known to nest on the cliffs of Naval Base Point Loma (Unitt 2004) and several locations around San Diego Bay. Peregrine falcons are observed frequently at the least tern MAT nesting site and occasionally hunt the SSTC nesting sites. During RECON’s 2005 surveys, one adult peregrine falcon was observed foraging just off Zuniga Point.

### California Brown Pelican

The California brown pelican was previously listed by the USFWS as threatened (35 FR 16047 October 13, 1970) and by the CDFG as endangered under the California ESA. However, The USFWS published the final rule to delist the Brown Pelican on Nov 17, 2009. The delisting went into effect on the 17th of December, 2009.

The California brown pelican is found primarily in estuarine, marine subtidal, and marine pelagic waters, especially within 12 miles of shore, but regularly to 100 miles. Nesting colonies occur on the Channel Islands and on the Coronado Islands (Garrett and Dunn 1981), with the largest breeding colony located on West Anacapa Island. The brown pelican is common along the coast throughout the year and, aside from being a regular visitor to the Salton Sea, is rare elsewhere away from the coast.

The brown pelican requires water, rocky cliffs, jetties, sandy beaches or mudflats for roosting, and open water for foraging. Its nesting season is January to September. Females do not breed before their third year, males even later. Eggs are laid from March to April in clutches that average three eggs and then are incubated for four weeks. Young fly from the nest in about nine weeks and beginning in mid-May pelicans disperse along the entire California coastline.

The primary food of the brown pelican in southern California is northern anchovy, although it also feeds on mullet (*Mugilidae* sp.), sardines (*Clupeidae* sp.), pinfish (*Lagodon rhomboides*), prawns, crustaceans, carrion, and other fish (Ehrlich et al. 1988; USFWS 2006b).

The population declined sharply in the 1960s due to the introduction of pesticides such as DDT into the food chain. After the banning of DDT and the pelican gaining federal protective status, nesting pair and productivity numbers began to improve, though numbers fluctuated widely by year in response to food availability (USFWS 2007a). The most recent estimate of the current population in 2002 is 150,000 birds (Gress 2005). Current threats include oil spills, commercial over-fishing of their food, entanglement in fishing tackle, disease, and pollution. Even though recovery plan criteria for de-listing have not been met, a Five-Year Review of the status of the California brown pelican recommended de-listing the species. This is because of the significant progress made toward its recovery as well as a lack of identified limiting threats, such as pesticide pollution, that likely initially caused its decline (USFWS 2007a). The productivity goals set in the recovery plan to de-list the species do not appear necessary to meet to maintain a stable population as breeding pair criteria have been exceeded in every year since 1985, with the exception of 1990 and 1992. The California brown pelican population in the SCB appears to be stable and healthy (Gress et. al. 2003).

California brown pelicans are regularly observed at all coastal or bayside Navy installations in San Diego Bay including NAB and NRRF. The California brown pelican is known to fly over, and rest in, San Diego Bay in the vicinity of the Delta Beaches as well as on the Navy Enhancement Island and the Fiddler's Cove wave attenuators (RECON 1996). The most recent avian species surveys in San Diego Bay focused on the water (November 2006 through February 2007) or on falling-tide shore areas (March 2006 through February 2007, excluding May and July), with many pelicans observed (Figure 3.12-12). The California brown pelican does not nest or breed in San Diego Bay.

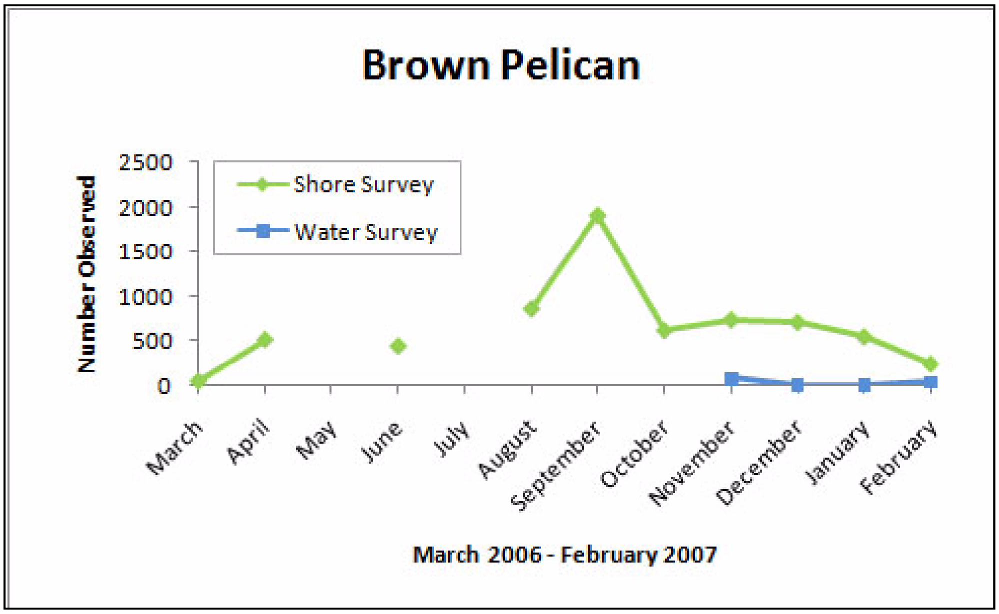



**Figure 3.12-12: Number of California Brown Pelicans Observed during the Most Recent San Diego Bay Bird Surveys**

### 3.12.1.4.2 Shorebirds

The U.S. Shorebird Conservation Plan (Brown et al. 2001) provides population estimates based on a synthesis of existing information from the Western Hemisphere. These numbers are sure to be revised as data become available. Population changes need to exceed 50 percent before they are detectable using databases such as the International Shorebird Surveys. Nevertheless, evaluations of existing databases indicate declines in many of the species that have been examined, declines that in some cases have been large and rapid. A 1995 summary showed that more than half of the shorebird species evaluated were declining, while only one species was increasing nationally (Brown et al. 2001). The following species descriptions are selected because these species are documented in San Diego Bay or nearshore area, are on the Birds of Conservation Concern List (USFWS 2008), are considered Highly Imperiled in the U.S. Shorebird Conservation Plan (Brown et al. 2001), and are classed as declining in California (Bird Species of Special Concern [BSSC] list (http://www.dfg.ca.gov/wildlife/species/ssc/docs/bird/BSSC-FrontMatter.pdf [Shuford et al. 2008]).

### Long-Billed Curlew

Just over 700 long-billed curlews were seen during the course of the San Diego Bay Avian Species Surveys (TDI 2006-2007). The majority of birds were found in the southern portion of San Diego Bay near the Saltworks. Several birds were also seen in the north, south-central and salt ponds regions of the San Diego Bay.

### Whimbrel

Whimbrel observations were just short of 300 during the course of the previously mentioned survey. These observations were made practically throughout the entire San Diego Bay. The most frequent sightings were recorded within the ocean grid and in the north, south-central, and south regions of the San Diego Bay.

### Dunlin

A total of 4,899 dunlins were recorded during the course of the San Diego Bay Avian Species Surveys with the highest count in March at 1,486, and the lowest in June with a count of only 2 birds. Dunlins were mostly seen in the southern salt ponds, and south-central eco-regions of San Diego Bay. However, a few were also seen in the oceanside of Silver Strand, as well as in the Harbor Island area.

### 3.12.1.4.3 Seabird

The gull-billed tern is on the BCC List (USFWS 2008), is a California Species of Concern, and is classified as declining in California on the BSSC list (Shuford et al. 2008). There were 273 gull-billed tern observations made during the course of the Navy-Port 2006-07 bird survey (Tierra Data Inc. 2008). This bird was mostly found in the ocean grid and in the south-central, south, and salt pond regions of San Diego Bay. They nest on bare ground and surround the perimeter with nearby pebbles and pieces of shells. These birds have a very broad diet which often includes insects and even other birds. The broad wings and black bill of this tern species along with a breeding season dark hood make it recognizable among co-occurring shorebirds. While the gull-billed tern itself is a conservation priority due to low population numbers, this bird preys upon and consumes offspring of other vulnerable species throughout San Diego Bay, making its management challenging.

### 3.12.1.4.4 Marsh Passerine Birds

The Belding's savannah sparrow (California endangered species) and the large-billed savannah sparrow (California Species of Concern and BSSC) are both passerines that reside in the salt marsh and are concerns to the State of California. Recent survey results are described below.

### Belding's Savannah Sparrow

Belding's savannah sparrows nest in the pickleweed salt marsh vegetation that occurs along the outer levees of the salt ponds, within the lower reach of the Otay River, and along the edges of the South Bay in remnant patches of salt marsh vegetation. The Belding's savannah sparrow is unique in that it represents one of only two wetland dependant avian species that reside year-round in the coastal salt marshes of southern California (Powell and Collier 1998). There were 746 Belding's savannah sparrows observed during the course of the 2006-2007 survey. Most of these sightings were in the south part of San Diego Bay and salt pond regions. This sparrow subspecies nests in salt marshes with low vegetation. Characteristically this bird is found in communities that are dominated by pickleweed, foraging at nearby beaches, mudflats, and lagoons. Increased development of coastal regions limits the preferred natural habitat that savannah sparrow favors, and thus its population is rather small. The Belding's savannah sparrow population estimate in California has increased over the years: 1,084 pairs in 1973, 1,610 pairs in 1977, 2,274 pairs in 1986, 1,844 pairs in 1991, 2,350 pairs in 1996, and 2,902 pairs in 2001 (Zembal and Hoffman 2002). However, statewide censuses of Belding's savannah sparrows reveal wide fluctuations in local population sizes, with local extirpations occurring in some years.

Belding's surveys conducted every five years since 1986 show a regular presence, but fluctuating numbers, within San Diego Bay National Wildlife Refuge (NWR). Habitat fragmentation, disturbance/predation, and changing conditions within the marsh are contributors to these fluctuations.

During the 2001 survey (Zembal and Hoffman 2002) identified 109 territories within the Sweetwater Marsh Unit, including 7 in Paradise Marsh, 93 in Sweetwater Marsh, and 9 at the F&G Street Marsh.

#### Large-billed Savannah Sparrow

Large-billed savannah sparrows were observed mostly in the south-central San Diego Bay between the Sweetwater River channel and Naval Station San Diego. A total of 57 accounts of this sparrow subspecies were recorded during the course of the 2007-2006 survey. Large-billed savannahs typically inhabit marshes, beaches and tidal flats, however they have been historically noted as city birds. Previously, even though this sparrow was a common fall and winter visitor, breeding pairs were not recorded.

### 3.12.1.5 Natural Resources Management Program and Current Mitigation Measures

#### 3.12.1.5.1 Program Overview

This section provides an overview of the Navy's long-standing Natural Resources Program that oversees the management of migratory birds and their habitat, as well as all other natural resources related to the SSTC. The specific measures directly related to protecting birds are part of this broader natural resources management program from which avian species also benefit.

All species groups are managed through INRMPs, including, at a minimum, baseline inventory and regular monitoring. The NBC INRMP addresses terrestrial and shoreline resources, while the San Diego Bay INRMP covers in-water resources jointly with the Port of San Diego. The latter is considered a bay-wide plan by local and regional resource agencies, which provided letters of concurrence or signatures.

These plans are developed collaboratively with the USFWS and CDFG, and are the primary vehicle by which natural resource projects are planned and funded. A broad range of goals, objectives, strategies and projects are identified and prioritized based on the need for regulatory compliance or stewardship.

An ecosystem management approach is incorporated into the INRMP to protect the properties and functions of natural ecosystems (Chief of Naval Operations Instruction [OPNAVINST] 5090.1 2007 and DoD Instruction 4715.3, the Navy's Environmental and Natural Resources Program Manual). Navy guidelines require that ecosystem-based management includes: a shift from single species to multiple species conservation, best available science, partnerships for ecosystems that cross boundaries, and adaptive management. The ecosystem mandate is accomplished by applying principles of sustainable use at several scales and long-term monitoring. Adaptive, day-to-day management takes place with emerging circumstances and new information by the Navy's natural resources professionals.

Under the NBC INRMP, which is currently under revision, baseline biological surveys in all species groups were recently completed for Naval Radio Receiving Facility and NASNI (RECON 2004, 2005). The San Diego Bay INRMP is also now undergoing a revision, in collaboration with state and federal agencies, and representatives from non-governmental organizations. Many stewardship projects and studies are proposed, as well as jointly funded, baywide surveys of natural resources such as eelgrass, fish, and birds.

All natural resources are also managed through the project site approval process, through which avoidance and minimization measures are considered during project development and implementation, and site-specific surveys are initiated as necessary.

Under the San Diego Bay INRMP, the first all-bay avian species survey was conducted in 2006-2007 of shorebirds, water birds, and seabirds, co-funded by the U.S. Navy and the Port of San Diego (Tierra Data Inc. 2008). These surveys covered shoreline and water areas only, and also covered all seasons. Results of this survey are incorporated into the sections that follow. Previous to this, avian surveys were conducted only on land or covered only certain parts of the bay or certain species groups. Though less comprehensive, these past surveys still provide value for the species groups and locations for which they were designed.

At NASNI, terrestrial avian surveys were most recently completed in 2004-2005 (RECON 2006). Both general and focused avian surveys have taken place other than those for federally listed species previous to this time. For 12 months, from 1999-2000, surveys were conducted monthly by the National Wildlife Research Center (NWRC) to provide information for the Bird/Animal Aircraft Strike Hazard (BASH) program (NWRC and U.S. Department of Agriculture [USDA] Wildlife Services 2000). At NAB Coronado, RECON conducted a general bird survey in 1996 to support a Navy INRMP (U.S. Navy 1998), building on earlier surveys in 1981 (U.S. Navy 1982). Avian surveys were also conducted at NRRF by RECON in 1996 (U.S. Navy 1998). Additional information was added from the 2001-2002 surveys (RECON 2004).

Previous to the baywide and terrestrial surveys described above and used as a basis for much of the data analysis in this document, several efforts had documented abundances in bay waters that focused on particular species groups or locations in San Diego Bay. Those separate surveys of avifauna of San Diego Bay in 1993-1994 resulted in an estimate of over seven million bird-use days per year, or an average of over 19,000 birds per day (with substantial peaks and lows), based on the average number of sightings during survey days (Ogden 1994, 1995; USFWS 1994, 1995). The 2006-2007 surveys, which covered all classes of birds on the water and on the shore, doubled this estimate to over 14,000,000 bird-use days per year, also with substantial highs and lows (Tierra Data Inc. 2008). The average number of birds observed per survey event (a three-day period to cover the entire bay) for the 2006-2007 surveys was almost 39,000.

For most routine maintenance or construction projects implemented by NBC, migratory birds are typically managed through measures to avoid the breeding season, and routine checking for nests before undertaking activities that may affect nesting birds. Trees are typically not removed unless it is unavoidable (related to the mission and or safety) if migratory birds are present.

Migratory birds also benefit incidentally from the threatened and endangered species conservation strategies associated with that specific management and monitoring. Surveys for listed species are conducted at potential construction sites if there is a possibility of their presence. Results of these surveys are reported within the planning documents (e.g. Biological Assessments, Environmental Assessments) for the proposed project.

The Navy pet management policy as well as the requirement to keep dogs on leash on Dog Beach are means to protect birds. The U.S. Navy policy regarding control of feral animals can be found in the following regulations: SECNAVINST 6401-1A, Veterinary Health Services; AFPMB TIM #37, Guidelines for Reducing Feral/Stray Cat Populations on Military Installations in the United States; OPNAVINST 6250.4B, dated 27 Aug. 1998, Pest Management Programs; and Family Housing Occupant Handbook; A Commander Navy Region Southwest (CNRSW) Metro Area Instruction and Family Housing Occupant Handbook have been developed to advise personnel of what to do if they come in contact with sick, dead or injured wildlife. Except for dogs restrained by fences in family housing areas, animals (including cats and birds) are not permitted to run loose on NBC. Possession or feeding of wild animals (including feral animals), regardless of docility or tameness, is prohibited. All dogs must be licensed, registered with security, and confined to a leash. Stray/loose animals should be reported to San Diego County Animal Control, or Station Police for violations of policy. The Family Housing Occupant Handbook contains guidelines for properly disposing of trash so as not to attract feral animals. NBC has a domestic cat management policy associated with the Housing Area. Cats are not allowed to be loose outdoors, nor may pet food be left outdoors.

Consistent with several BOs on federally listed species, avian predators of federally listed birds are harassed to avoid incidental take of the listed species. For instance, pyrotechnics are used to frighten waterfowl, shorebirds, and seagulls from loafing or roosting around the airfield, and a wire grid is placed on ponds of the NASNI golf course to discourage the use of these water features by birds that may pose a risk to federally listed species. Avian predator management occurs consistent with ESA Section 7 consultation with the USFWS, as well as with USFWS permitted actions by the Navy's contractor (USDA- Animal and Plant Health Inspection Service Wildlife Service). The Navy continues to cooperate with USFWS in removing peregrine falcons in the vicinity of nesting terns and plovers. In addition, as described in the BO on the Navy Lodge Expansion and the BO on airfield activities at NASNI, building and project design incorporates the use of anti-perching devices and materials in the vicinity of nesting western snowy plovers or California least terns.

### 3.12.1.5.2 History of Management for Listed Avian Species

The following describes efforts the Navy has undertaken to protect avian species listed under ESA present in military training areas. For over 30 years, the Navy has built a comprehensive program to protect and manage resources on SSTC and NASNI. The program has been adaptive in nature, adjusting to changes in natural resource conditions and training needs, and adding to and modifying management measures based on experience and past effectiveness. The Navy and USFWS have worked extensively together to hone these measures over the years. The Navy's current mitigation measures are discussed in Section 3.12.4. Areas mentioned in the following text are indicated on figures in the Terrestrial Section of this EIS, Figures 3.11-7 and 3.11-8.

### Origin of the Navy's Establishment of Protected Nesting Sites for Terns

The early days of the Navy's tern management program originated with the construction of a helicopter MAT facility, including a Light Airborne Multipurpose System (LAMPS) MK III, that resulted in the loss of a nesting area and displacement of what was 13 tern nests in 1977, the year terns were first documented as nesting there. By 1979, according to the BO that was signed in 1980 (USFWS BO 1-1-80-F-18 5 March 1980), about 68 nests were located at the facility. A total of 63.45 acres were affected by the project, including 36 acres to resurface the asphalt.

In order to establish a defined site where the nests could be protected, a 21.55-acre area of the existing nesting area called the MAT site was preserved, indefinitely, for nesting terns at NASNI. An additional 29.2 acres were prepared on an annual basis as alternate nest sites, including predator and vegetation control, in the event the MAT site was not successful.

In addition to the sites at NASNI, the Navy agreed in a 1983 BO (USFWS BO 1-1-82-F-123 2 March 1983) to "exclude 75 acres of land at Delta Beach from public access by fencing for least terns under the terms of a Memorandum of Understanding between the USFWS and NAB Coronado…" The BO required that the area be "fenced and officially established as a nesting site." The designation of the Delta beaches as a "least tern preserve" was formalized in a 1984 MOU between the U.S. Navy and USFWS (DoN and USFWS 1984) that was drawn up to provide long-term management of the 75 acres identified for least tern nesting at the Delta beaches in the 1983 BO 1-F-82-F-123. The MOU did not intend to inhibit the use of Delta beaches for military maneuvers, but it attempted to restrict these maneuvers to the north and east perimeters during the nesting season. Up until the time of this BO and MOU, Delta Beach North had been used both for Navy training and as a public boat launching facility. Installing fencing around the area eliminated the site for use as a public boat launch facility. The Navy was required to address the loss of public recreational access to the site, and under a California Coastal Commission (CCC) Consistency Determination (CD-4-84 22 February 1984), was required to lease 40 acres of land (Alpha Beach) to the State of California to develop for park and recreation purposes. The Navy also graded a road to Alpha Beach to facilitate public access there.

The Navy implemented a number of measures to promote nesting at the Delta site. The Navy began controlling vegetation at the site to enhance suitability for terns which do not prefer highly vegetated areas for nesting habitat. The Navy also added sand to the site to enhancing the substrate for nesting. The Navy employed decoys at the beginning of the nesting season to attract nesting terns to the protected site. The Navy also began a program for controlling predators and a program for monitoring the site for nesting success.

### Navy Adapts to the Expansion of Least Tern and Snowy Plover Nesting Colonies on SSTC

In 1994, California least terns began nesting on oceanside beaches where military training takes place. Protections had to be established to protect the terns, and this began the development and evolution of a series of adaptive set of measures, with each year bringing ever-increasing tern numbers and a new set of circumstances. As nesting on oceanside training beaches continued to increase, the Navy adapted and improved their approach as a result of information gained from monitoring and experimentation.

In 1996, the Navy coned off 500 yards of Green 2 Beach from training activity to avoid incidental take of nests, and also added decoys to attract birds to a designated nesting area where they could be protected and training could continue unimpeded elsewhere (BO 1-6-97-F-37 2 June 1997). Around the same time, the Navy enhanced the substrate of Delta Beach South, which expanded that nesting area from 10 to 15 acres. This resulted in an increase from one nest to 21 nests at Delta Beach South, and the expansion of nesting on the oceanside beaches continued, amplifying the challenge of protecting the terns (Copper 2003).

In 1992, western snowy plover nests began appearing on the SSTC-N oceanside beaches. The Navy began establishing avoidance zones by emplacing stakes less than 30 meters around the nests which were avoided during training. 1,200 yards of Green Beach were coned off by the Navy to protect nesting in the lanes. Poles for powerlines along the Silver Strand Highway were also removed and the powerlines were placed underground to reduce perches for predators. The Navy also purchased receivers to monitor peregrine falcons and increased predator control on SSTC-N. Along the eastern boundary of SSTC-N Oceanside beaches, the Navy installed no trespassing signs to deter the public from entering or wandering into the nesting area.

The Navy and USFWS continued to collaboratively re-think the strategy to protect terns. In 2000, the Navy added beach crossing lanes to allow training groups to move between the sand road near Highway 75 and the hard-packed area near the water's edge (BO 1-6-99-F-28 3 May 1999 and extensions in 2000 and 2001). This was to protect nesting birds from accidental disturbance or mortality due to military activities (there had been incidental take (mortality) due to military activities of one western snowy plover and several terns in 2000). The coning off of Green Beach was discontinued as attempts to attract the birds to this safe area had failed, and by then almost 50 percent of San Diego Bay Navy terns were on the oceanside beaches. The bright orange and large cones were abandoned in favor of smaller and more portable blue stakes. The blue color was selected as it was believed that the bright orange color of the cones might attract avian predators (primarily ravens and crows). Instead of coning off the entire beach, individual tern nests were marked with a three-foot stake, but this created confusion for operators as to where training was permitted to occur.

The Navy changed its strategy in 2002 when lanes Green 2 and Blue 1 became the focus of concern about nesting in needed training areas (BO 1-6-02-F-2645.1 16 April 2002) . The beaches were raked with an instrument dragged behind a High Mobility Multipurpose Wheeled Vehicle to deter nesting in those lanes and eggs were collected if present during pre-raking surveys. Collected eggs were taken for care to Project Wildlife (a wildlife rehabilitation non-governmental organization). Raking continued as often as twice per day, with the intent of discouraging tern nesting without affecting plovers. Other measures to discourage nesting were also undertaken, such as placing wooden stakes with flagging. Beach raking was found to be labor intensive, costly, and generally ineffective since terns continued to attempt to nest behind the raking activity. Raking was abandoned after one year (2002) as ineffective. However, the Navy continued to collect eggs that were in harm's way and take them to Sea World to be hatched, where it was determined if the chicks could be reared in captivity. The Navy set aside three unraked lanes for nesting. Tern nests outside the three lanes were marked with tongue depressors and subject to incidental take. Plover nests continued to be afforded protection with marking and buffer distances of less than 30 meters; military personnel were instructed to avoid the staked areas. At the same time, efforts continued to attract the oceanside birds to nest on the Delta beaches. A fence was removed at Delta Beach South and grading was expanded to the entire southern site (Copper 2003). At the same time, the Navy also implemented efforts to retain washed-up vegetation on the Oceanside beaches to promote foraging of western snowy plover where it didn't interfere with military operations.

Around 2003, it was determined that annual disking of the Delta sites to improve the substrate for nesting habitat was promoting undesirable weeds, so the Navy switched its practice of disking to grading the sites. Also, despite efforts to deconflict training activity on the beaches and attract the birds to the Delta nesting sites, there were double the birds on the oceanside beaches compared to the previous year. For unknown reasons, the training beaches continued to be preferred by the birds despite efforts at preparing the Delta beach sites and heavier training activity on the Oceanside training lanes. Despite this, the Navy successfully avoided incidental take of the birds, which remained far below the incidental take authorized in its biological opinions.

Pursuant to BO FWS-SDG-3452.1, the Navy continued the seasonal restriction of training in the three beach lanes in 2003, with beach crossing lane alignments modified, as needed, to minimize the number of nests requiring relocation (15 May 2003). Trying another approach, a lane in front of Green 1, called the Alpha lane, was added to allow high tide crossing by training groups. Incidental take was permitted for up to 50 eggs to be collected and taken to Sea World for captive rearing. Up until the 2003 breeding season, predator management was conducted in all Navy nesting areas; however, in another effort to deter terns from nesting on the beach, predator control was discontinued on the NAB ocean beaches in 2003 (only conducted in Orange 1 and 2). The effort was undertaken as an experiment, to see if discontinuing predator control would deter terns and move to the safer Delta Beach areas to nest, as previous efforts had been costly and unsuccessful (Kenney 2004). A change in nesting pattern was never apparent, and predator management on all sites resumed in 2004. Around this time, the Navy also began installing mini-exclosures around western snowy plover nests to reduce predation on eggs and fledglings.

In 2005, the Navy worked to further improve its predator control efforts. Nixilite™ (a deterrent material applied to structures to prevent roosting and repel birds) was installed on the fence by Delta South to deter predators from perching on the fence and preying on nests on Delta South. The Navy also installed video and still cameras to better understand which species are predating on the terns. In a new approach to attract terns to where they could be protected, about 3,000 cubic yards of sand were added to Delta Beach to benefit the substrate conditions for both least tern and snowy plover nesting there. The Navy graded and topographically modified Green 1 and Green 2 with hummocks (small sand hills) to reduce their attractiveness for nesting; the hummocks were effective in deterring terns from nesting in that area. The Delta beaches, Blue 2, Orange 1, and Orange 2 were treated with herbicides to enhance nesting attractiveness. The same management strategies used in 2005 and 2006 were implemented in 2007 with an extension of the 2005 BO (FWS-SDG-3452.3 16 July 2007).

### Western Snowy Plover Management Evolves With Measures Adapted for NASNI Airfield and Expansion of the Navy Lodge

Two BOs discuss snowy plover management at NASNI and resulted in changes in the action area regarding how snowy plovers are managed. The BO on NASNI Ongoing Operations addressed Bird/Animal airstrike hazards on the runway, as well as recreational and military training use of the southern NASNI beaches) (FWS-SDG-3908.3 2005). One of the historic problems at NASNI has been plover nesting on the airfield runway to the north, which may be due to inadequate availability of alternative areas for the plovers closer to the shoreline. Also, in some years the southern beaches have narrowed and have been temporarily unsuitable for nesting. The Navy Lodge Expansion (BO FWS-SDG-3908.5 20 July 2005) addressed the expansion of the Navy Lodge and its potential effect on western snowy plovers that nest on adjacent beaches. Among other requirements, the BO required (1) continued marking for 30-meter diameter buffers and monitoring; (2) avoidance of staked areas when beach raking; (3) setting aside of 14.9 acres of suitable (and historically used) plover habitat as off-limits to foot traffic, vehicle traffic, beach raking, and pets during the snowy plover breeding season; (4) implementation of predator controls including anti-perch materials on buildings; (5) placement of signage and distribution of educational materials to patrons, employees, life guards; (6) training for construction workers; and (7) shielding of lighting away from the beach during nesting season. The CCC added a requirement in its Consistency Determination (CCC ND-93-05 15 December 2005) as follows: “During the plover nesting season (March 1 through August 15), the Navy agrees to monitor the beach for plover nests in front of the NASNI Navy Lodge prior to each raking event. However if our [i.e. Navy] natural resources personnel determine that our efforts are meeting the objectives set forth in our BOs, specifically that NASNI supports 12-13 pairs or a maximum number of 12 nests. The Navy, at its discretion, may refrain from monitoring prior to raking.” The stated informal management objective of 12-13 nesting pairs (20 breeding season adults) for NASNI is carried forward in the Final Recovery Plan for the western snowy plover (Unit CA-127 in USFWS 2007b).

### Other Navy Agreements Related to California Least Terns

The Navy’s management measures for the California least tern and western snowy plover with regard to training activities in the SSTC are covered above. In addition to these measures, further avoidance and minimization measures are undertaken for past military construction projects, and for routine in-water construction and maintenance works. Two important elements of the Navy program are described below.

**In-Water Construction Noise and Turbidity Programmatic Agreement.** A programmatic agreement between the USFWS and the U.S. Navy establishes standards and conditions for in-water construction activities in San Diego Bay to protect the endangered California least tern (DoN and USFWS 1987, 1993, 1999, 2000, 2004). Originally a five-year MOU, it was most recently renewed for two years in 2004, and a letter from USFWS allows for recognition of that MOU until a new one is signed (Letter from Therese O’Rourke to Capt. Anthony T. Gaiani FWS-SDG-08B0211-08I0203 December 18, 2007). This MOU was developed concurrently with the development and improvement of the management program on SSTC, and many of the protective measures described above were formalized in this MOU agreement. The MOU provided an additional 10 acres of tern nesting area at South Delta Beach, as well as an additional three to five acres of California least tern foraging habitat, the removal of overhead power lines at Delta Beach, predator control efforts for tern colonies, studies to determine effects of various in-water construction activities, end-of-year reports on tern population monitoring, and a list of proposed U.S. Navy projects to be conducted in San Diego Bay. In exchange, ongoing maintenance and new construction activities could be conducted by the U.S. Navy in San Diego Bay without the need for formal consultation with USFWS on each activity as long as specific, delineated least tern foraging areas were not affected. Under the agreement, the U.S. Navy provides an annual funding source of $250,000 for management and monitoring of the least tern, as well as a one-time funding source of $500,000 to be used to create additional tern foraging or nesting habitat. In addition, the U.S. Navy provides a permanent position within the U.S. Navy to oversee the implementation of the MOU. The 1987 MOU was updated in 1993 and provided for annual funding by the U.S. Navy to continue least tern management and predator control.

The western snowy plover derives coincident benefit from the California least tern protection measures afforded through the Navy-USFWS MOU on in-water construction activities, as well as other measures that enhance nesting success in the same locations where the plovers nest.

**Fiddler's Cove Surface Coverage Biological Opinion.** A BO addressing marina repairs and improvements at Fiddler's Cove was issued in 2007 regarding least tern foraging concerns (FWS-SDG-4032.6). These concerns arose as the result of the development of additional dock structures in Fiddler's Cove Marina that would cover bay waters adjacent to the Delta South least tern colony. The USFWS determined that this project would not result in any incidental take of the California least tern, but noted that the significance of any future net losses of such habitat on the survival and recovery of the species would be magnified, given the importance of protecting or enhancing high quality foraging habitat in San Diego Bay in close proximity to nesting colonies.

### 3.12.1.5.3 Current Management and Mitigation Measures for Listed Species

Based on the experience gained by the Navy and its agency partners over the years, the following sections list current management that would be carried forward under the No Action Alternative for both the least tern and snowy plover on training beaches. Modifications to this management under Alternatives 1 and 2 are discussed in Sections 3.12.2.3 and 3.12.2.4, respectively. Management measures have been adaptive in the past and will continue to be in the future as changing circumstances dictate a modified approach.

#### Beach Lane Seasonal Conservation Areas and Marking/Avoidance Measures

- Two bayside training areas (Delta North and South) of beachfront Navy-administered lands are restricted from military foot and vehicle traffic during the breeding seasons of western snowy plover and California least tern except for a Beach Crossing Lane on South Delta. Access to the three oceanside lanes (Blue 2, Orange 1, and Orange 2), which under current management measures are set aside during the breeding season, will be modified by the two access criteria discussed in Section 3.12.2.3 for Alternative 1. When restricted from use, the perimeter of the oceanside training lanes is delineated with blue flexi-stakes or cones when terns first arrive. No military training is permitted within the protected areas except for designated beach crossing lanes. Since plovers nest individually or in loose groups rather than in dense colonies like the terns do, plover nest scrapes are marked with approximately 30-meter buffers for avoidance beginning approximately March 1. The beach crossing lanes are positioned to avoid the largest number of nests that would require relocation. Beach crossing lanes are marked with stakes for their entire length. Differences in training lane access do occur between the alternatives in this EIS, such that all SSTC-N surfside beach training areas would be available for use under Alternative 2, regardless of time of year, whereas usage is dependent on training needs in Alternative 1.
- Beach scheduling procedures bias activities with heavier beach use towards beach lanes with fewer nests, when it does not impact the realism of training or training needs.
- Plover nests are marked except in the training lanes set aside during nesting season. A surrounding buffer area of approximately 30 meters, or smaller, is also marked with blue flexi-stakes which are removed seven days after hatching, or when biologically practical to minimize impacts to plovers. No military training is permitted to occur within the delineated buffer or protected areas. Under Alternative 1 and 2, the Navy would post stakes around up to 22 western snowy plover nests at one time on SSTC oceanside beaches, plus any additional nests that are initiated in beach lanes Orange 1 and Orange 2.

- Also depending on site-specific circumstances, some plover nests are covered with a mini-enclosures (MEs) to protect from mammalian and avian predators. Once chicks hatch, markers and MEs are removed within seven days, or when biologically practical to minimize impacts to plovers. The MEs are not installed when the risk of attracting humans that will potential disturb the nest appears to outweigh the risk of predation.
- Due to the high predation rate from gull-billed terns, “wickets” or domes are used to offset predation by this species. Wickets are made of two pieces of small gage wire and formed into a one-foot dome. Domes are placed over least tern nests to discourage gull-billed terns from preying on eggs or chicks and/or destroying eggs when feeding from flight. A study on the effectiveness of domes that documents reproductive success of the terns with domes is being funded by the Navy. Due to this study wickets or any other form of exclusion that is developed will be used unless they are determined to be ineffective.
- To reduce harassment of nesting plovers, symbolic fencing with blue stakes (fencing that marks the area for people to avoid but does not prevent birds from entering or leaving) is practiced on NASNI in front of the golf course, building 710 of Breakers Beach (the recreational beach), and the Small Arms Range surface danger zone.

### Communication of Training Area Protocols

- The Navy works to ensure effective communication and coordination among the biological monitors, the Natural Resource Office, and the scheduling commands for NASNI, SSTC-N and SSTC-S. Beach users are informed: (1) that blue flexi-stakes or cones denote the boundaries of nests or protected nesting areas for least terns and snowy plovers; (2) that the presence of tongue depressors within beach lanes mark the location of least tern nests; (3) which training areas are authorized; and (4) that incidental take of least terns and snowy plovers at SSTC-N and SSTC-S shall be avoided to the extent consistent with effective, realistic training. These access restrictions will be modified and communicated as necessary as the Navy meets criteria and thresholds for opening additional lanes.

### Nest Relocation

- Nests may be moved small distances, as necessary and appropriate, to reduce conflicts with training, although such moving is infrequent. Snowy plover and least tern nests located in the Beach Crossing Lanes are typically relocated to safe areas as conflict is expected, and nests have been relocated due to the threat of flooding. The Navy reports to the USFWS any circumstance that necessitates movement of any tern or plover nest. This is done with submittal of the Navy’s weekly reports to the USFWS Carlsbad Field Office. If relocation is necessary, nests are moved the shortest distance possible into suitable habitat to increase the chance for nest success.

### Predator Management and Control

- Predator control of mammalian and avian predators of the least tern and snowy plover is conducted at all nesting sites. Due to the very rare status of the gull-billed tern, control of this known predator has not been approved by the USFWS. To date, the Navy has not been authorized to capture, relocate, shoot, or otherwise deter this species although annual Migratory Bird Depredation permit applications have been submitted to the USFWS since 2005. Isolated attempts by USDA Wildlife Services to discourage gull-billed terns from entering least tern nesting colonies were considered ineffective.
- The Navy has been using pole traps on and off since the inception of the program dependent on discussions with the USDA and the USFWS. These pole traps are designed to catch avian predators of least tern and plover chicks, such as the American kestrel.

- Predator control to manage southern fire ants, field ants, Argentine ants, and pyramid ants found on North and South Delta Beaches and NASNI is conducted prior to and during the snowy plover and least tern nesting season.
- The Navy, USFWS, and CDFG work cooperatively each season regarding the relocation of American peregrine falcons if they are determined to be impacting the least tern or snowy plover.
- Cameras are used to monitor least tern colonies on Navy property for predators. Cameras are also used as a tool for monitoring, specifically collecting status information. Cameras allow documentation of what species is predating least tern chicks.

### Nesting Deterrence through Habitat Modification and Harassment

- Sand hummocks or other substrate modification may occur in the Green Beach lanes prior to the breeding season to discourage nesting there. If necessary, sand hummocks or other substrate modification may be considered for other lanes, in a manner that is compatible with military training requirements.

### Continued Site Preparation for Maintaining Nest Site Suitability

- Site preparation, in accordance with the USFWS's BO on the MAT Development Program (1980-BO 1-1-80-F-18; 1983-BO 1-1-82-F-123 Navy's LAMPS MKIII facilities development program) and the California least tern MOUs, is performed on North and South Delta Beach and NASNI. Continued maintenance of these sites offsets the effects of previous construction projects and associated loss of habitat at NASNI as well as some of the effects of the current Proposed Action. Site preparation includes grading or mowing to remove annual plant growth, inspection, replacement or reinstallation of the site grid poles and of chick barriers around the site perimeter, use of tern decoys, and placement of chick shelters throughout the nesting colony.
- Sand enhancement of nesting sites occurs as feasible.
- Although site preparation was discontinued on all NASNI alternate nest sites in the past, it will continue at the current alternate nest site north of Weapons as an experiment in the event that the MAT site needs to be moved.
- In order to provide nesting cover for chicks, minimize invasive weeds, and protect rare plants, the locations of coastal woolly-heads (*Nemacaulis denudata*), and Nuttall's lotus (*Lotus nuttallianus*), are marked for avoidance prior to grading or herbicide use. Coast woolly-heads and Nuttall's lotus are indicators of a healthy, natural habitat that is conducive to nesting by providing a mosaic of vegetation for chick shelter and escape cover.
- No kelp or other natural marine vegetation that collects on beach tidal areas is removed from the oceanside beaches of SSTC-N or SSTC-S. Kelp is managed at YMCA Camp Surf by relocating it to areas where it does not provide an unsafe environment for children. Marine vegetation at YMCA Camp Surf is not buried, but left on the surface for use as forage material by plovers.
- Mowing is practiced at NASNI airfield to maintain a habitat condition that is not preferred by nesting birds, in order to deter bird-related airstrikes. Areas within and adjacent to the airfield are mowed when 25 percent of the vegetation reaches eight inches or higher as measured from the soil. The mowing schedule is coordinated with the NBC Botanist and Wildlife Biologist.
- Regular beach cleanup in targeted areas will continue.

### Nest Substrate Enhancement

- In order to provide suitable nesting substrate that does not foster weed invasion that may harm nesting or fledging success, the Navy treats invasive exotic plants. Since iceplant can help dune stabilization and its removal can be expensive, some iceplant may be left in place. This iceplant may be subsequently removed when money is available for natives to be planted at the site.

- Substrate enhancement of nesting sites occurs as opportunities arise with available sand or dredge spoil.

### Signage and Education

- Signs have been positioned every 500 feet on the sand road that parallels SR-75. They inform the public of the need to avoid marked areas that designate nesting locations of snowy plovers or least terns on the beach.
- Signs are also placed at South Delta such as the large sign informing about least terns. Most plover areas also include a sign to explain the blue stakes.
- Signs are occasionally provided by State Parks to help with managing trespassers at Orange Beach and north of SSTC-S.
- An interpretive sign on least terns and snowy plovers is in development for the bike trail near South Delta Beach.

### Recreational Use Restriction

- The Navy works to eliminate recreational or casual use of the beaches by military personnel and their dependents who live in the Naval housing that is across SR-75 from Blue 2, Orange 1, and Orange 2. An annual letter is sent out to educate military housing residents about recreational use restrictions. In addition, the Navy works to eliminate nonmilitary civilian use of nesting beaches through security patrols and guards. Signage, fencing, public awareness campaigns, and/or enforcement are all necessary to achieve successful control.

### Rearing of Collected Eggs, Injured, and Sick Individuals

- All injured or sick individuals are taken to a wildlife rehabilitation center, such as Project Wildlife, for rehabilitation.
- If needed, least tern eggs that have been collected are provided to Project Wildlife or Sea World, as appropriate, for hatching and rearing. Terns were reared in captivity in 2002 and 2003 after the eggs were collected to discourage nesting on the operational beaches. The least tern chicks proved very difficult to raise, whereas snowy plover chicks, which are precocial, are easier to raise. Tern survival after rehabilitation proved to be minimal if at all. All chicks are released in areas approved by the Navy with guaranteed predator management.
- The success of reared western snowy plovers as adults is tracked and evaluated to develop more effective rearing methods, with a few releases that were preliminarily successful.

### Western Snowy Plover Health Study

- Due to an unknown cause of mortality in adult snowy plovers in and around San Diego Bay that began in 2005, the Navy supports studies and efforts by the USFWS to determine the cause of the mortality.

### Monitoring for Effects and Adaptive Management

- California least terns and western snowy plovers are monitored for incidental take at all San Diego Bay NBC training locations. The Navy prepares an end-of-the-year report that documents, at a minimum, the location of nests collected, number of nests/eggs collected, the hatch date of each egg collected, the unique band combination given each captive-reared chick, the approximate fledgling date and the release date/location of each fledgling, and suggestions to improve the efficacy of this process if used in future years. This information is necessary to assess the amount of incidental take, and the effectiveness of using this approach to minimize impacts.

- Biological monitoring of the least tern and the snowy plover during the breeding season is performed by qualified and USFWS-permitted experts at all nesting sites. The general schedule for monitoring is provided below but is modified based on findings in the field and/or operational requirements.
    - NAB Ocean Beach: Monitoring for least terns and snowy plovers is conducted three to four days each week from March 1 to April 15, five to six days per week from April 15 to August 1, and three to four days per week from August 1 to August 31.
    - NAB North and South Delta Beach: Monitoring for least terns and snowy plovers is conducted three days a week from April 15 to April 30, four to five days a week from April 30 to July 31, and three days a week from July 31 to August 31.
    - Monitoring for snowy plover occurs one day per week from September through February.
    - Monitoring at SSTC South for snowy plovers is conducted one to three days a week from March 1 to mid-September (and one day per week during the winter).
- Banding of least tern and snowy plover adults and chicks is done in conjunction with monitoring of nests at NASNI, SSTC-N and SSTC-S. Due to the large number of nests that must be monitored and the number of quality bands received from the USFWS, not all adults or chicks are banded. Any least tern or snowy plover nest relocations are reported to the USFWS Carlsbad Field Office. Semi-monthly and annual reports are provided to the USFWS.
- A California least tern foraging study was conducted in 2009 to examine foraging patterns to evaluate if certain areas have higher foraging value than others. This study report is currently under preparation.

### Light-Footed Clapper Rail Management

Since the light-footed clapper rail is listed as federally endangered, formal consultation with the USFWS under Section 7 of the ESA is required prior to any potential impacts to this species. The Navy currently does not conduct training activities at the location where this species may breed, which is leased to the City of Coronado for the South Bay Marine Biological Study Area. Periodic surveys are conducted to determine species presence and breeding status, and natural resources-related activities are possible at this location.

Management of the clapper rail is addressed in the NBC INRMP with a program at NOLF Imperial Beach driving the management of this species at SSTC-S. The NOLF Imperial Beach program was established in 1992 through an MOU between the U.S. Navy and the USFWS. The focus of management is a little over 600 acres of the south and west NOLF Imperial Beach property that is managed as part of the Tijuana River National Estuarine Research Reserve and TSNWR. The MOU is reviewed for renewal every five years.

The NBC INRMP identifies three primary approaches for protecting the light-footed clapper rail:

1. Develop and participate with other agencies in a regional approach and formal agreements for conserving salt marsh across the species' range in the context of local land use requirements;
2. Protect cordgrass sites from erosion; and
3. Improve nesting and foraging opportunities when habitat restoration or creation projects are undertaken. The Navy has participated as a partner in the light-footed clapper rail captive propagation program at the Sweetwater Marsh NWR (USFWS 2006).

### 3.12.1.5.4 Management of Birds of Conservation Concern and Heron Nesting Trees

The following species are special status birds that have received management attention in previous NEPA documents because of their occurrence in the action area.

#### Heron Management

The U.S. Navy has been managing herons at nesting sites on NASNI and NAB Coronado. At NASNI, colonies of great blue herons (*Ardea herodias*), black-crowned night herons, little blue herons (*Egretta caerulea*), and snowy egrets (*Egretta thula*) nest annually at a half dozen locations. Heron surveys of Naval Base Coronado, Naval Base Point Loma, and Naval Base San Diego were most recently conducted in 2008. .

As part of the mitigation for the berthing of a Nimitz Class Aircraft Carrier, the U.S. Navy committed to five-year monitoring of the heron populations on NAS North Island from 1996 to 2001, construction of Heron Park as an alternate nesting site to replace the main nesting site lost to construction associated with preparations for the carrier, and development of a heron management plan. The management plan is currently being developed. The U.S. Navy established "Heron Park" (NASNI) as a dedicated, protected safe nesting site. Ten new trees were planted interspersed with existing ones, and four platforms were erected as interim nesting structures while the new trees matured. This is a result of an EIS and ROD for locating the nuclear carrier (CVN I) in 1995 and addressed the removal of nesting trees (Torrey pines and eucalyptus). The attempt to attract herons to Heron Park has not yet been successful. The Navy is currently looking at ways to enhance the area through the Metro Heron Management Plan, which is in development by the U.S. Army Engineer Research and Development Center.

#### California Brown Pelican Management

No BO currently addresses incidental take of the California brown pelican because no impacts were anticipated during previous consultations. However, the California brown pelican benefits from the management of construction-related noise and turbidity addressed in the MOU on in-water construction. The MOU primarily addresses protection of California least terns, but also benefits the pelican because in subtidal habitats, turbidity plumes created during dredging in the upper water layers (to about 18 inches deep) are contained by silt curtains or otherwise mitigated. In addition, noise created during construction or maintenance activities such as pile driving is managed during periods when these species are foraging due to the potential effect of noise on fish forage (US DoN and USFWS 2004).

In addition to these construction-related measures, the employment of pyrotechnics to frighten birds from the NASNI airfield (a BASH concern) are not used at any shoreline being utilized by California brown pelicans. A letter from the USFWS to the Navy Natural Resources Office Director (19 October 2001 FWS-SDG-2321.1) authorizes the use of pyrotechnics at the NASNI airfield to discourage waterfowl, shorebirds, and seagulls from loafing or roosting around the airfield and the placement of a wire grid over ponded waters at the NASNI golf course. The letter concurred with the Navy's position that these measures are not considered "take" of a federally listed species such as the brown pelican or least tern. Pyrotechnics remain prohibited adjacent to the MAT site, the western beach areas south of Zuniga Point, or the immediate shoreline areas of NASNI when these areas are used by federally listed species. Individuals responsible for using pyrotechnics must be able to identify California brown pelicans and least terns by sight.

#### Burrowing Owl Management

The western burrowing owl is a federal species of concern, USFWS bird of conservation concern, and CDFG species of special concern. Western burrowing owls are commonly observed on NASNI. The NASNI owls have been monitored by the Navy for many years (see Figure 3.11-4), and their numbers are known to be declining, as they have been in many coastal areas across the state. Surveys have been conducted since 1989, with numbers varying from about eight to 30 pairs (Garcia and Conway 2007; Table 3.12-7). Map 3.11-4 in the previous chapter indicates burrowing owl locations in 2005-2007 on NASNI.

**Table 3.12-7: NASNI Burrowing Owl Data**

| Year | NASNI Burrowing Owl Estimate | |
|---|---|---|
| | pairs | nests |
| 1989 | - | 14 |
| 1990 | 14 | 13 |
| 1991 | 17 | - |
| 1992 | 26 | - |
| 1993 | 27 | - |
| 1994 | - | - |
| 1995 | - | 28-31 |
| 1996 | - | - |
| 1997 | - | - |
| 1998 | - | - |
| 1999 | 11.5 | 13 |
| 2000 | - | - |
| 2001 | - | 8 |
| 2002 | 6 | 12 |
| 2003 | 6 | 8 |
| 2004 | 4-8 | 14-16 |
| 2005 | 4-7 | 10 |
| 2006 | 4-7 (7 unpaired) | 12 |

NOTE: Blank cells indicate lack of available data

As a result of impacts to burrowing owls during the 1995 construction of berthing for a new nuclear carrier (CVN I, MILCON P-700) a number of measures were implemented as documented in the EIS ROD and subsequent correspondence between USFWS and the U.S. Navy. Burrowing owls were relocated as necessary. All burrows within the eelgrass mitigation site, before it was excavated, west of Moffet Road were examined for occupancy by burrowing owls or California ground squirrels (*Spermophilus beecheyi*) prior to mitigation work. Burrowing owls were discouraged from using this area. Twenty-five artificial burrows were constructed in the open space south of Taxiway 9 and north of Rogers Road to provide an alternate site for owls to occupy. Burrowing owl management areas at NASNI were identified north of Rogers Road (Site C in Figure 3.12-13). Activities and construction that negatively affect burrowing owls are prohibited within these areas. The area is excluded from future development and parking, unless discussion with the USFWS is reinitiated.


**Figure 3.12-13: Letter Designations for Burrowing Owl Management Areas on NASNI**

Other burrowing owl management areas (including sites E and F in the EIS) are historical nesting locations and are identified as set-aside areas where wildlife and their associated habitats are formally recognized as a land use priority. Due to potential conflicts with species protected under the ESA at sites E and F, no artificial burrows were constructed to assist or encourage owl nesting. Also, owls may be moved or discouraged from nesting in certain areas if they are determined to be preying on species protected under the ESA. Ground maintenance schedules for some areas may be altered to benefit nesting shorebirds and not owls, and ground squirrels may be controlled, if the control of rodents is determined to benefit federally listed species.

In supporting the Coastal Consistency Determination on the Navy Lodge Expansion at NASNI (15 December 2005), which addresses impacts to the Site C set-aside area from the construction of the Morale, Welfare, and Recreation cottages, the Navy committed to providing nest boxes in an area on the approach end of Runway 29 between golf course holes 16 and 17. While there has been no documented conflict between burrowing owls and the western snowy plover, the owl mitigation area (described above) was established where any potential conflict between plovers and terns would be minimized to the greatest extent possible. Owls are sometimes excluded from establishing a nest in areas of potential conflict. Since burrowing owls utilize burrows created by ground squirrels, these mammals are managed to benefit the owl where they are co-located, such as by controlling the use of rodenticides in the vicinity.

A burrowing owl management plan is in progress by the University of Arizona (in draft as of November 2009, and owl monitoring (including burrow marking) continues every year based on funding availability.

Mowing in areas of potential burrowing owl habitat continues on a regular basis as occurred in the mid-1990s so that vegetation never exceeds four inches.

The following procedures are common to all burrowing owl management areas:

- Small signs are placed next to each active burrow to identify the site as a nest and restrict any potentially harmful activities.
- The use of rodenticides, insecticides, and pesticides is forbidden. The use of pesticides that may affect ground squirrels in burrowing owl habitat is explicitly restricted in the NBC INRMP.
- Surveys are conducted during the breeding and nonbreeding seasons. Burrows are examined for condition and predation on sensitive species. Adults, and any relocated juveniles, are banded during breeding season surveys using USFWS leg bands. Winter surveys are conducted to measure productivity of each site. Artificial burrows have been installed in recent years.
- Burrowing owls and their habitat are managed to encourage successful breeding and sustainability with the goal of supporting a minimum number of nesting pairs.
- All active burrows are marked with standard markers to ensure that burrows are not destroyed by maintenance activities (e.g., mowing, pest management, and golf course maintenance).
- Beneficial mowing continues each year to allow for the success of burrowing owl foraging. Mowing contracts include language to avoid burrow markers.
- Ground squirrels are managed to benefit burrowing owls. Burrowing owls use burrows created by ground squirrels. Ground squirrel control is done in areas where the ground squirrels increase the BASH risk or negatively affect other essential operations. Golf Course management and maintenance personnel avoid using pesticides/herbicides and ground squirrels are not removed in areas that support burrowing owls. To sustain ground squirrel populations, no rodent control is conducted unless mandated by an outbreak of disease or the rodents are negatively impacting a listed species. Squirrel burrows are never filled, buried, or gassed without consulting the NBC Wildlife Biologist.
- Areas that support burrowing owls as well as current nesting areas and/or nesting areas from the previous year are considered mitigation sites, excluding areas on the Golf Course north of Sherman Road.
- Burrowing owls that are documented predators of the federally listed California least tern and western snowy plover are removed or managed in a manner that eliminates their impact on the listed birds (e.g. covered with a flight cage).

#### American Peregrine Falcon Management

Peregrine falcons are known predators of the chicks of California least terns. To date, the Navy has not received concurrence to add the peregrine falcon to the Predator Control Take Permit to trap and remove from nesting colonies. However, in cooperation with USFWS Refuges, the falcons are removed and relocated if necessary from Navy California least tern nesting sites, as described in the 2005 Training BO (FWS-SDG-3452.3 10 March 2005), under the USFWS take permit.

### 3.12.2 Environmental Consequences

This section presents the analysis of potential impacts to avian resources as a result of implementation of the project alternatives, including the No Action Alternative. There are 78 existing training activities included in the alternatives, including 11 that are new to the ROI under the action alternatives. Implementation of either of the action alternatives will result in an increase in the number of training activities that are conducted. The primary difference between the action alternatives is a change in training lane access; such that all SSTC-N surfside beach training beaches would be available for use, regardless of time of year under Alternative 2, while available on a contingent basis under Alternative 1. Therefore, any impacts associated with Alternative 2, while being similar to those for Alternative 1, would be dispersed across a larger area due to reduced training area restrictions.

The types of training activities that could affect birds include activities on land, water, and in the air. Waterbirds and shorebirds that regularly forage offshore or in the San Diego Bay could be affected by water activities while birds that primarily use the shoreline environment for nesting, feeding, or roosting could be affected by activities on land. Activities in the air could affect all bird species. Because birds are so widespread in the ROI, almost every training activity has the potential to affect them.

Training activities in the alternatives were divided into component activities which occur in a defined manner and space and can therefore be assessed for their impact on the environment. Each of these activities may be found in common among multiple training activities, and the increase in training activity tempo between the No Action Alternative and Alternatives 1 and 2 was assessed for its associated increase to the activities contained within. The activities defined for this analysis are: air activities, marine vessel activities, underwater detonations, and amphibious and beach activities including: vehicle use, fluid transfer activities, foot traffic, pyrotechnics including simunitions and blanks, manual excavations, and activities in the inland area of SSTC-S. The activity descriptions below provide general information about how large a footprint on the beach or inland areas each activity normally requires. Also noted is the general location on the land where the activity takes place, which can determine how it could affect resources that are not evenly dispersed across the landscape.

While the majority of the activities in the ROI have the potential to affect birds, several occur primarily indoors, or otherwise do not have much contact with avian species and are not analyzed in this document. These activities include Rappel and Fast Rope Training (Activity 35, see Table 2-1) that is conducted within the concrete fenced compound of NAB, portions of Breacher Training (Activity 31, see Table 2-1) which occur inside Bunker 99 and swimming activities, although any security vehicles that are part of swimming activities are still analyzed.

Additionally, birds are known to sometimes consume plastic and other trash, or become entangled in it. The presence of trash is inevitably associated with human presence. Non-military trash and plastics will accumulate on training beaches through transport of these wastes by prevailing currents. Due to the controlled access of the public within the training areas and policing procedures of training areas, there will be less trash on SSTC than on neighboring beaches. While a slight but persistent effect from solid waste on birds is present, solid waste from military training activities is limited. Military training will not increase trash or plastics on the beach because trainees check the training areas for trash at the conclusion of each activity; this effect is not discussed further in this EIS.

### 3.12.2.1 Approach to Analysis

The activities that may affect avian resources are described below. Adverse effects to a federally listed species such as the California least tern and western snowy plover are discussed in terms of disturbance and potential lethal effects to individuals, and the impact of these effects on the overall population. These impacts, for each alternative, are discussed in Section 3.12.3, Federally Listed Species Impacts, at the conclusion of the alternatives discussion under Section 3.12.2, Environmental Consequences.

The consequences of the proposed military readiness activities on non-federally listed migratory birds or on modification of their habitat are evaluated based on the criteria described in the final rule authorizing the DoD to take migratory birds during military readiness activities (50 CFR Part 21 28 February 2007). As mentioned previously (Section 3.12.1.1.1), military readiness activities are exempt from the take prohibitions of the MBTA provided they do not result in a significant adverse effect on a population of a migratory bird species. An activity has a significant adverse effect if, over a reasonable period of time, it diminishes the capacity of a population of migratory bird species to maintain genetic diversity, to reproduce, and to function effectively in its native ecosystem. A population is defined as "a group of distinct, coexisting, same species, whose breeding site fidelity, migration routes, and wintering areas are temporally and spatially stable, sufficiently distinct geographically (at some point of the year), and adequately described so that the population can be effectively monitored to discern changes in its status."

For the purposes of this effects analysis, species population numbers are considered on the scale of San Diego Bay, of the SCB, or rangewide, within the ROI, as data is available (see Tables 3.12-5 and 3.12-6). Monitoring occurs at each of these scales (as described in the MBTA above; Section 3.12.1.5.1); however, the proportion of each population using the ROI varies widely by species. The criteria are considered in the context of whether any consequence of the activities affects sufficient numbers of individuals compared to the population as a whole (at all three scales), or sufficient habitat degradation or loss occurs, such that the activity "diminishes the capacity of a migratory bird species to maintain genetic diversity, to reproduce, and to function effectively in its native ecosystem."

A total of 210 distinct species covered by the MBTA are found within the ROI (species were recorded in recent Navy-Port bird surveys of San Diego Bay). Some of these species are also federally listed and/or state listed as threatened or endangered (see Table 3.12-5). Sixty are assigned a special status by resource agencies or organizations that monitor the condition and trend of bird populations (see Table 3.12-5).

In each case, the area the individual activity encompasses and the value and type of habitat known to occur within the specific footprint are considered. Consequences to habitat are considered by whether they are substantial compared to habitat availability or scarcity, and whether the impacted bird species has a special sensitivity status as recognized by resource agencies. An effect is also evaluated as to the intensity, duration, or frequency of the activity such that the species may not return to its former abundance levels, or the loss of habitat or habitat value (based on disturbance) is considered permanent compared to background variation in these conditions. This is because most birds are very susceptible to human disturbance. Lights, noise, boats, the presence of people, free-running pets and feral animals may determine levels of bird use more than the biological suitability of the habitat. Abundance data from Tables 3.12-5 and 3.12-6 are used to support this assessment. Loss of habitat for those species that have a proportionally high dependency on the ROI's natural resources is also considered adverse, even if the species is not assigned a special status. Examples are black brant, bufflehead, surf scoters, scaup, and ducks (see Tables 3.12-5 and 3.12-6). Habitat loss could be roosting, foraging, or breeding habitat. However, in every case of adverse effect, the criteria are not met unless such adverse consequences impact a population rather than individual birds.

Whereas some baseline data exist for the relative abundance of waterbirds, seabirds, and shorebirds in both San Diego Bay and nearshore ocean waters (Tierra Data Inc. 2008), estimates for the absolute abundance of birds are few and usually site-specific, as well as insufficient for detecting abundance trends. Therefore, effects on birds are expressed in relative terms.

The single species that is state listed and not federally listed, the Belding's savannah sparrow, depends in large measure on pickleweed salt marsh, and these areas remain protected under all alternatives. Therefore, it is not considered further. Also, species that are assigned a special status but for which the ROI is of low importance compared to its distribution, range, or habitat preference, are not analyzed further. This includes all special status raptors (northern harrier, white-tailed kite, and Cooper's hawk).

All alternatives avoid effects in habitat protection areas such as the 40-acre lease to State Parks, the Biological Study Area under license to County Parks, and the Delta Beach North and Delta Beach South training areas during the least tern and snowy plover nesting season. Also, training activity does not take place in mudflats or salt marshes because they are either in out-lease areas or they are not conducive to training.

### 3.12.2.2 No Action Alternative

The No Action Alternative maintains the baseline level and types of training. Environmental management measures are unchanged. It should be noted that while the current management system of beach lanes was developed for protecting the California least tern and western snowy plover from training activities during the nesting season, it carries ancillary benefit to other bird species.

#### 3.12.2.2.1 Air Activity

Air activities consist of helicopter flights as well as Unmanned Aircraft System (UAS) takeoffs, landings, and activity practice. Under the No Action Alternative, there are 11 activities that involve aircraft training (Activities 4, 6, 7, 16, 25, 26, 29, 30, 35, 64 and 66, see Table 2-1). Many of the training activities that utilize helicopters do so over the open ocean environment; the helicopters are used for transport and dropping individuals off into the water, where they will either swim to shore or perform activities in the water. Helicopters may also drop individuals into the bayside drop zone. Helicopter landings are only proposed to occur during three types of activities and only at SSTC-S where they may land or hover over inland areas of SSTC-S to drop off or pick up personnel. Helicopter hovering over land typically occurs over SSTC-S inland areas.

Kushlan (1979) compared short-term responses in wading birds (mainly Ardeids) upon exposure to a propeller-driven fixed-wing aircraft and a Bell 47G-2 helicopter. Only two colonies were studied. Although the data presented were insufficient to determine the degree to which different species were disturbed by the helicopter, the helicopter caused fewer disturbances than the fixed-wing aircraft. In all cases, birds that were disturbed and left their nests returned within five minutes. Possible previous experience of these birds with helicopters is not mentioned, nor the frequency, altitude, or duration of the flights.

When occurring on the naturally disturbed (due to wave and wind action) beach environment, effects of landing and takeoff are temporary, short-duration, and minor. They are limited to sand blow and flushing of mobile birds that may be at the landing area. The habitat area available for fleeing, seeking refuge, or hiding is generally large in comparison to the footprint of the helicopter activity. SSTC-N is under training lane management during the avian breeding season, so lasting impacts to breeding birds are minimized. In the inland area of SSTC-S, birds could be startled and run or fly off. As pointed out by various researchers (for example, Bowles et al. 1991, U.S. Department of Interior [USDI] 1994), stress is not necessarily indicative of negative consequences to individual life histories or to populations. Researchers have documented a wide range of physiological and behavioral response with much variation, and anecdotal information about one animal’s response is not useful for drawing conclusions about that or other species. Overflights can induce physiological response in animals, such as increased heart rates, but whether or not such responses cause harm is unknown. Effects may be synergistic, as when combined with natural events such as harsh winters or water shortages (USDI 1994). The behavioral and physiological response of birds in the vicinity of overflights is also considered short-term and without lasting impact; however it is considered a moderate effect due to the fact that special status birds may be present during vulnerable life stages. This effect would be strongest for land birds at SSTC-S where helicopter activity is more frequent.

The effect of UAS activities would not be as much of a disturbance as helicopters. Migratory birds, including potentially nesting passerines at SSTC-S and the western snowy plover on the SSTC-S beach, may be disturbed by the presence of UASs overhead or the presence of a pilot on the ground. To test this, UAS activities were observed at SSTC-S on May 5, 2006 by USFWS permitted biologists to record western snowy plover response and that of other avian species in the area. One smaller UAS flew over the inland area of SSTC-S only, and no reactions from any bird species were observed. A larger UAS flight at SSTC-S did circle over a plover nest. The flight continued with the UAS flying back and forth over the beach at varying altitudes, frequently flying directly over the plover nest. The plover continued incubating throughout the test including when the UAS came in to land back at inland SSTC-S. The plover did not appear at any time to respond to the presence of the UAS. Approximately 45 sanderlings were foraging or roosting on the beach in front of the plover nest and the beach gate and were visible from our observation point, as were 10 willets. These birds all showed no alteration in their behaviors in response to the UAS. A C17 crossed over the site and no change in behavior was observed in either the plover or the other shorebirds. A Cessna high-wing crossed over the site and the plover crouched slightly in response to this plane, apparently reacting to the noise and speed of the plane. Neither the foraging nor roosting sanderlings showed any evident response to the UAS. Gull-billed terns were present throughout the observation period, foraging along the beach and in the dunes with a minimum of 12 visible at one time. They moved constantly back and forth across SSTC-S between the ocean and San Diego Bay. No alteration in behavior was observed in the gull-billed terns in response to either UAS.

Any effect of air activities are considered negligible to moderate, short term, and an effect on individuals of each migratory bird species rather than to any population.

### 3.12.2.2.2 Marine Vessels

Marine vessel use in the ROI consists of small craft, power-driven surface craft, and water jet-driven craft. Small craft, usually under oar, are used by trainees to navigate in San Diego Bay and ocean waters, as well as for transportation to shore for training activities. Interactions between personnel/craft and birds, which are anticipated to be rare, such as swimming or activities that utilize only non-motorized Combat Raiding Rubber Crafts, are excluded from the action analysis. This is because potential interactions would be minimal to nonexistent due to the large area of available habitat, the small footprint of a swimmer or CRRC, and opportunity for birds to avoid these marine activities with minimal energy expenditure because of their slower speed (swimmers and craft under oar). Under the No Action Alternative, marine vessels both power-driven and under oar are utilized in 54 of the 78 training activities (Activities 1-6, 8-16, 18, 20-26, 27-35, 37-46, 48, 49, 51-55, 60, 71, 73, 77, and 78, see Table 2-1). The effects of Elevated Causeway (ELCAS) activities on the shore environment are covered under Amphibious Actions in Section 3.12.2.2.4. The total number of vessels varies per activity, but multiplying the number of vessels by the number of events in which they are used, and summing over all the activities, results in approximately 11,500 vessel use events per year in the No Action Alternative (see Appendix C). Assuming use every day of the year equals 32 vessels using the ROI per day in varying activities. Power-driven surface craft are used for a variety of purposes in the ROI. They are used in entirely water-based activities, where trainees practice navigation, mock boat attacks, and boarding drills. These craft are also used to transport people or equipment to shore for raids or activities, as safety support for swimmers during physical fitness training, and to transport marine mammals for training. Under the No Action Alternative, training activities involve propeller and jet driven surface craft of various size and speeds. Activities occur in both San Diego Bay and oceanside training lanes, including landing on beaches to varying degrees. The number and types of boats that beach is discussed in Section 3.7.3.2.1, (Marine Vessel Actions).

An especially large marine vessel, the Landing Craft Air Cushion (LCAC), is used during four training events per year (Activity 27, see Table 2-1). They are scheduled to occur on any oceanside beach training area including lanes 1-14 and the Breakers Beach area of NASNI. An LCAC is a large, propeller-driven craft that uses fans to hover above the water. Its footprint includes its physical structure plus the area surrounding it, which is affected by the strong winds it produces. An LCAC beaches up near the crest of the beach. It also indirectly affects birds by disturbing foraging resources such as invertebrates in the sand or in the wrack line.

Waterfowl sensitized to boating disturbance will often flush (take flight suddenly) when a boat motor approaches within 0.6 mile or more (Kahl 1991). There is evidence that birds using an area for stopover resting and replenishment during migration are more vulnerable and susceptible to disturbance effects (Figley and Vandruff 1982). Migrating birds do not accustom themselves to boat movements as resident birds do (Figley and Vandruff 1982). Effects on foraging birds attempting to build energy reserves before continuing their migration can be significant enough at a physiologically vulnerable time to affect their productivity. A high level of disturbance can decrease the carrying capacity of an area to these birds (Dahlgren and Korschgen 1992). Disturbance by human activity can cause displacement, excess energy expenditure, disruption of feeding and nesting or roosting, and exposure of special status bird species to predation.

In the waters of the SSTC and for elsewhere, few data are available to quantify the effect of boat traffic on birds. Furthermore, it is rarely possible to separate the relative importance of population fluctuation in the ROI. This is due to an array of disturbance factors:

- Loss, fragmentation, and degradation of salt marsh, sandy beaches, mudflats, and upland transition habitats.
- New introductions of native species not previously observed in the ROI due to expanded ranges, perhaps due to problems elsewhere. This has occurred with the black skimmer, elegant tern, and gull-billed tern.
- Community level changes, such as the invasion of crows, as a result of continuing urbanization.
- Loss of breeding grounds outside the ROI.
- Effects from bioaccumulation. The brown pelican, peregrine falcon, and double-crested cormorant are all recovering from past effects of contaminant bioaccumulation, a process by which toxins build up in an organism over time because the substances are very slowly metabolized or excreted. Bonaparte's gulls may be susceptible due to their proclivity for sewage outfalls. Birds migrating from southern latitudes may be more susceptible to this problem.
- Over-harvesting of prey. Commercial fishing operations often crop 50 to 70 percent of fish production so that little is left for natural predators such as seabirds (Furness and Ainley 1984, cited in Baird 1993). While such harvesting does not occur in San Diego Bay itself, fishing offshore can affect forage fish abundance for fish that migrate into San Diego Bay or the San Diego Bay during their juvenile life stages.
- Climatic cycles or change.

Cywinski (2004) summarized the effects of motorized watercraft on waterfowl from the literature. When approached by powerboats or jet skis, waterfowl generally take flight, though the distance flushed and the amount of time spent in flight varies. Flushing can reduce feeding time, deplete energy resources, cause avoidance of prime feeding sites and decrease reproductive success. Boats also enable humans to enter remote areas such as small islands and wetlands that are essential foraging and breeding sites for waterfowl. Flushing increases the energy expenditure of waterfowl, which can be detrimental for migration and reproduction. The energy cost of flight is high, 12 times the basic metabolic rate of waterfowl (Ward and Andrews 1993). Therefore, waterfowl must increase their food intake to make up for the lost energy, which can be difficult when food supplies are limited (Ward and Andrews 1993). Cywinski (2004) also compared watercraft types in relation to disturbance of birds. Personal watercraft have the ability to operate at high speed in shallow areas, such as wetlands and near shorelines, where waterfowl feed and breed. They produce a large vertical and horizontal spray due to their deep-V hull (Rodgers and Schwikert 2002). Rodgers and Schwikert (2002) studied 23 species of waterfowl on the east and west coasts of Florida and observed that the great blue heron flushed farther when approached by personal watercraft than by boat, while little blue heron, willet, and osprey exhibited larger flush distances in response to the outboard powered boat (Rodgers and Schwikert 2002). A study by Havera et al. (1992) showed waterfowl took flight in response to hunting and fishing craft, while few flushed because of barges. Korschgen et al. (1985) found that birds were more sensitive to boats with outboard motors. In a study of management options to reduce boat disturbance on the foraging seabird black guillemots (*Cepphus grylle*) in Canada (Ronconi and St. Clair 2002), it was found that smaller boats had more tendency to flush than medium ones. The black guillemot is considered particularly sensitive to flushing because it forages close to its breeding colony.

Because of shallow, relatively calm water bayside and the proximity of shoreline habitats, as well as the absence of a dredged boat channel, shorebirds and waterbirds are relatively abundant in these training areas (see Figures 3.12-1 and 3.12-2). This abundance is concentrated in the period between late fall and early spring due to use of these areas by Pacific Flyway migratory birds. Water jet driven craft under the No Action Alternative do not precluded use of the area, but are likely to have some non-measurable effect on waterbird and shorebird energy expenditure. Because of the size of San Diego Bay compared to boat traffic patterns and the adjacency of the South San Diego Bay NWR for birds to take refuge, any temporarily displaced birds have ample opportunity to land elsewhere. Overall, the use of small boats is lower in the training lanes compared to areas of north San Diego Bay and south San Diego Bay (U.S. Navy 2000).

Actual vessel use is not evenly distributed in the water nor seasonally through the year; neither is bird use. Some of this partitioning results in a reduced potential for impacts on birds. For instance, marine vessels tend to avoid mudflats and adjacent marshes because these areas are shallow, liable to entrap their vessels, and generally difficult to beach in. These are locations of concentrated bird activity because they are food-rich; thus much of the potential for vessel-bird interaction is avoided. In contrast, marinas and docks tend to be avoided by birds while vessel activity is concentrated there. Avian survey data show, for example, relatively low waterbird and shorebird densities at Coronado Cays and other marinas (see Figures 3.12-1 and 3.12-2; Tierra Data Inc. 2008).

Flushing of birds is expected to be greatest with jet-driven, fast-moving, agile vessels, like jet skis. Most of the vessels used during training are large and slow moving. While much of the potential interaction between birds and marine vessels is naturally avoided by use preferences as described above, there may be an effect during the winter period when avian use of the SSTC waters is concentrated and the migrants are more vulnerable because of their need to rest. Due to a large area of available habitat in proportion to the area of interface between vessels and birds, this effect is considered short-term. While such flushing or other effects of marine vessels on individual birds may occur, none of these temporary effects are expected to have an adverse effect on migratory birds at the population level, as the temporarily displaced birds have ample space to land elsewhere.

### 3.12.2.2.3 Underwater Detonations

Underwater detonations that take place under the No Action Alternative are detailed in Section 3.7.2.2.2 of Marine Biological Resources (see Table 3.7-9). All detonations would occur in the oceanside training lanes within designated boat lanes 1 to 14. Detonations would occur in water ranging in depth from 6 to 72 feet, depending on the activity. Concern about potential animal mortality associated with the use of underwater explosives led military researchers to develop mathematical and computer models that predict safe ranges for birds and other animals from explosions of various sizes (e.g. Yelverton et al. 1973; Goertner 1994). A concern in the SSTC ROI is for diving waterbirds, since they can spend several minutes under water. Examples are grebes that winter along the coast line and may spend six minutes under water, or loons that can dive to depths of 75 meters for periods up to eight minutes at a time to forage for fish (Gill 1995).

Seabirds transiting through the area or performing brief diving behaviors may be affected by a short-term, transitory alarm or startle response while in the area. Shorebirds scavenge the shoreline primarily by wading, so they would not be directly exposed to the blast unless in flight.

The rapid rise time of the shock wave resulting from detonation of high explosives causes most of the tissue and organ damage in avian species. Mortality correlates better with impulse, measured in units of pressure-time, than with other blast parameters (Yelverton 1981). Injury or mortality to waterbirds due to underwater detonation occurs in a non-linear fashion with distance from the blast, and is complicated by bottom substrate, the position of the animal in relation to the blast, and the weight of the charge. Birds diving at depth would receive a larger impulse than at the surface of the water. A bird diving over a hard surface would receive a greater impulse than it would in open water (Yelverton et al. 1973, Yelverton 1981). Bottom reflection can also be enhanced if it is focused by bottom terrain. Yelverton et al. (1973) conducted tests to determine the far-field underwater blast effects on birds, using a test pond facility and explosive charges weighing up to eight pounds and detonated at ten feet of depth. Ducks were tested on the water surface and at two-foot depths. Underwater blast criteria were developed which correspond to safe and damaging impulse levels for birds along with curves relating the impulse criteria as a function of range and charge weight.

Table 3.12-8 presents the mortality data for rouen and mallard ducks tested at two-foot depths at ranges between 23 and 36 feet. Some survived at 31 and 33 feet. A probit analysis was run on the data relating mortality in probit units to the log impulse measured at two-foot depths. The equation below gives the probit mortality curve with its 95 percent confidence limits:

$$Y = -37.516 / 25.767 \log_{10}X$$

where Y is the percent mortality in probit units, X is the impulse in psi-ms (pound per square inches-milliseconds), and –37.516 and 25.767 are the intercept and slope constants, respectively. The impulse associated with the 95 percent confidence limits for 1 percent mortality (Lethal Dose $[LD]_1$) was 36.3 (28.0 to 39.1) psi-ms and the $LD_{50}$ (50 percent mortality) was 44.7 (42.8 to 47.8) psi-ms.

Table 3.12-9 presents mortality data for ducks exposed at the water surface. Death occurred at slant ranges of 13 and 14 feet from the 8-pound charges but not at 15 to 21 feet. The impulses at 13 and 14 feet were on the order of 129, 148, and 173 psi-ms. That high impulse levels were necessary to kill ducks on the surface probably was due to the fact that the birds were partly out of the water. Since the lungs of the birds were located dorsally along the vertebrae, these target organs were mostly above the water line. All of the ducks that died from the blast two feet underwater primarily had extensive pulmonary hemorrhage, ruptured livers, and ruptured kidneys. The ducks placed on the water surface had similar injuries except for the lack of kidney damage. Eardrum rupture was also evident.

**Table 3.12-8: Explosive Exposures and Mortality of Ducks**

| Mortality for Ducks at 2-foot Depths | | | |
|---|---|---|---|
| Slant Range, feet. | Peak Pressure, psi (Impulse, psi-ms) [Cut-Off Time, ms] | Mortality r/n[a] | Mortality Percent |
| 23 | 558 (70.9) [0.361] | 3/3 | 100 |
| 27 | 455 (55.3) [0.314] | 3/3 | 100 |
| 28 | 441 (51.7) [0.293] | 3/3 | 100 |
| 31 | 402 (46.1) [0.277] | 6/9 | 67 |
| 31-32 | 396 (43.3) [0.261] | 3/12 | 25 |
| 33 | 363 (39.9) [0.252] | 2/12 | 17 |
| 36 | 333 (35.6) [0.236] | 0/0 | 0 |

[a] r/n = the number killed over the number tested. All charges were 1 pound.
Source: Yelverton 1981

**Table 3.12-9: Mortality and Injuries for Ducks on the Water Surface**

| Charge Weight, pounds | Range, feet Slant/Horizontal | Peak Pressure, psi | Impulse, psi-ms | Cut-Off Time, ms | Effect | Lung Hemorrhage | Air Sacs | Liver Rupture |
|---|---|---|---|---|---|---|---|---|
| 8.0 | 13.0/8.6 | 2484 | 172 | 0.095 | Death[a] | Extensive | Ruptured | Extensive |
| 8.0 | 14.0/10.0 | 2007 | 148 | 0.093 | Death[a] | Extensive | Ruptured | Extensive |
| 8.0 | 13.0/8.6 | 2335 | 148 | 0.079 | Survived | Slight | Intact | Extensive |
| 8.0 | 14.0/10.0 | 2152 | 129 | 0.074 | Death | Extensive | Ruptured | Extensive |
| 8.0 | 15.0/11.4 | 1995 | 114 | 0.069 | Survived | Extensive | Ruptured | Extensive |
| 8.0 | 15.0/11.4 | 1753 | 100 | 0.073 | Survived[a] | Extensive | Ruptured | Extensive |
| 8.0 | 17.0/14.0 | 1813 | 95 | 0.064 | Survived[a] | Slight | Ruptured | Slight |
| 1.0 | 9.8/1.0 | 1495 | 94 | 0.105 | Survived | Extensive | Ruptured | Extensive |
| 1.0 | 10.0/2.3 | 1454 | 90 | 0.103 | Survived | Extensive | Intact | Extensive |
| 1.0 | 11.0/5.1 | 1309 | 77 | 0.094 | Survived | Extensive | Intact | Slight |
| 8.0 | 19.0/16.3 | 1383 | 77 | 0.067 | Survived[a] | Slight | Intact | Slight |
| 1.0 | 12.0/7.0 | 1189 | 67 | 0.086 | Survived | Slight | Intact | Slight |
| 1.0 | 14.8/11.2 | 931 | 46 | 0.09 | Survived | Slight | Intact | Slight |
| 8.0 | 21.0/18.6 | 1153 | 42 | 0.047 | Survived[a] | None | Intact | Slight |
| 1.0 | 17.9/15.0 | 762 | 34 | 0.058 | Survived | None | Intact | None |

[a] Mallard ducks, the others were Rouens.
Blast parameters measured at 0.25-feet depths.
Source: Yelverton 1981

For birds diving under the water, the 1 percent mortality threshold ($LD_1$) was 36 psi-ms (Table 3.12-10). Most of the birds that survive this impulse level would appear unhurt, but in fact sustained moderately-severe internal injuries from which they could recover on their own. At higher impulses, the mortality rate climbs sharply as does the severity of injury. At impulses below the $LD_1$ range, the severity and incidence of blast injuries is expected to rapidly decrease. At 20 psi-ms, there would be slight lung injury in half the cases and about a 50 percent probability of eardrum rupture. An impulse of 10 psi-ms resulted in little or no injury, and no eardrum rupture. A no-effect or safe impulse was 6 psi-ms.

**Table 3.12-10: Underwater-Blast Criteria for Birds Diving Beneath the Water Surface**

| Impulse (psi-ms) | Criteria |
|---|---|
| 45 | 50 percent mortality. Survivors seriously injured and might not survive on their own. |
| 36 | Mortality threshold ($LD_1$). Most survivors; moderate blast injuries and should survive on their own. |
| 20 | No mortality. Slight blast injuries and a low probability of eardrum rupture. |
| 10 | Low probability of trivial lung injuries and no eardrum rupture. |
| 5 | Safe level. No injuries. |

Source: Yelverton 1981

Birds on the surface were relatively unaffected by underwater explosions because the location of their vulnerable organs puts them at least partially above the water line. Consequently, separate criteria are used (Table 3.12-11), considering impulses occurring at a three-inch depth. The mortality threshold was on the order of 100 to 120 psi-ms. A safe impulse for birds on the water surface was taken to be 30 psi-ms.

**Table 3.12-11: Underwater-Blast Criteria for Birds Diving on the Water Surface**

| Impulse, (psi-ms) | Criteria |
|---|---|
| 130-150 | 50 percent mortality. Survivors seriously injured and might not survive on their own. |
| 100-120 | Mortality threshold ($LD_1$). Most survivors; moderate blast injuries and should survive on their own. |
| 40-60 | No mortality. Slight blast injuries. |
| 30 | Safe level. No injuries. |

Source: Yelverton 1981

According to Yelverton (1973), the safe impulse distance for birds, for all practical purposes, can be the same as that for diving mammals. That is, birds must be closer to the blast to sustain injury. Without a means to avoid blast impacts to diving birds, there is a potential for mortality due to injuries from these detonations. Transiting seabirds or those resting on the water may be startled and also experience concussive injury, although they do not spend as much time under water as waterbirds, or species such as cormorants.

The Navy has conducted empirical tests and modeling to determine appropriate buffers for underwater detonations (Section 3.9.2.4.2). Model results show that 31 psi-ms (which is more conservative than the 36 psi-ms underwater bird mortality threshold) translates into a maximum safety buffer radius of 240 feet (largest detonation and most extreme environmental conditions) in shallow water. With these modeled results, underwater detonation protective measures were developed to establish a safety buffer zone around each detonation point (Section 3.9.2.8.1) that is protective of marine mammals, sea turtles and birds. The buffer is 1,200 feet for detonations occurring in zero to four fathoms of water and 1,500 feet for detonations in four to 12 fathoms of water. Buffer zones were established based on marine mammal thresholds, but are also protective of birds. Two observers with binoculars and small craft survey the detonation area and buffer zone for birds. If flocks of birds or diving birds are sighted within the buffer zone or moving towards it, activities are suspended until the birds voluntarily leave the area. Immediately following the detonation, visual monitoring for birds within the buffer zone takes place for 30 minutes. Observations are made for animals with signs of injury; injured animals are reported to the NRSW Environmental Director and the Pacific Fleet (PACFLT) Environmental Office. The radius of the area searched is guided by that necessary for marine mammals and sea turtles; this is sufficient for diving birds. In this way potential effects to birds are minimized.

With these protective measures and distances, potential injury and mortality to birds due to underwater detonations are minimized. There remains the possibility of occasional injury or mortality for individual birds or bird flocks that are missed by the observer or enter the area after the time visual scanning is complete but before the detonation takes place. If trivial injury were to occur, these adverse effects would be to individual birds and not at the level that a population of migratory birds would be affected.

### 3.12.2.2.4 Amphibious and Beach Activities

Training activities encompassed in this section include amphibious beach activities. Amphibious activities include the use of amphibious vehicles (Amphibious Assault Vehicle [AAV] / Expeditionary Fighting Vehicle [EFVs], and Lighter, Amphibious, Resupply, Cargo 5-ton [LARC Vs]) and causeway/ELCAS training. Beach activities included in this analysis are fluid transfer activities, vehicle use, foot traffic, pyrotechnics including simunitions and blanks, and manual excavations. Training activities include the use of training areas within both San Diego Bay and the nearshore ocean environment.

### Amphibious Activities

Amphibious activities include amphibious vehicles such as AAV/EFVs, LCAC, and LARC Vs as well as impacts from floating causeway and ELCAS activities. It also includes amphibious offloading of equipment (Activity 49, see Table 2-1). Also included is pile driving associated with ELCAS (Activity 42, see Table 2-1). Finally, these activities sometimes involve the use of bulldozers on the beach for floating pier assemblage, excavating for Causeway Pier Insertion and Retraction, Landing Craft Utility (LCU) / Landing Craft Mechanized (LCM) Beaching, LCU/LCM Towing/Being Towed, or for insertion of the elevated causeway (Activities 41, 42, 45, and 46, see Table 2-1).

The LCAC approaches the sandy beach and disperses much in its path through wind and direct impact. The safety zone for humans around an LCAC is a 50-yard radius. Sand can be blown 10 to 20 yards at high velocity from around the bottom of the air cushion skirt.

Other amphibious vehicles in the ROI include AAV/EFVs and LARCs and are covered under Beach Activities/Vehicle Use below, because their impact is similar to large terrestrial rather than amphibious vehicles. ELCAS and Causeway beaching and associated activities involve accessing beach areas through the surf zone using floating and land-based heavy equipment. Construction of floating causeways and ELCAS requires movement of sand and heavy equipment to level the sand where the causeway is planned for construction and prepare it for pile driving and/or anchoring. ELCASs are installed on piles driven into the bottom. The floating causeway is inserted into a notch excavated on the beach and offshore sections remain floating. ELCAS and Causeway activities occur primarily on SSTC-N oceanside boat and beach lanes, and in the bayside Bravo Beach training lane. These training activities could occur on the SSTC-N oceanside training lanes as well as in the designated training lane within Bravo Beach during three separate training activities (41, 42 and 49, see Table 2-1) annually under the No Action Alternative, for a total of 12 training events.

Potential effects on birds due to amphibious activities include flushing on the water and on the beach of individuals or flocks of birds, and short-term and temporary disruption of foraging or roosting activity.

Habitat for foraging or roosting may be temporarily unavailable due to occupation of the amphibious landing area and associated activities on the nearby beach. The footprint are typically small (the vehicle itself plus a small buffer) or but on some infrequent activities could occupy a large portion of one or two trainings. Many of the amphibious activities do not impact nesting birds, since nesting birds are typically well above the high tide line (covered below under Beach Activities) and many amphibious activities stay below the high tide line.

Birds are less common in the surf of the oceanside beaches, whereas shorebirds may roost and forage in the tidal zone or in the beach wrack. Because of shallow, relatively calm water bayside and the proximity of shoreline habitats, as well as the absence of a dredged boat channel, shorebirds and waterbirds are relatively abundant on the bay shores (see Figures 3.12-1 and 3.12-2). Their abundance is concentrated in the period between late fall and early spring due to use of these areas by Pacific Flyway migratory birds, and in shallow waters near mudflats or marshes, or over eelgrass. Since amphibious activity is concentrated on the sandy beach, this partitioning along reduces the potential for impacts to birds.

The amphibious activities may have some non-measurable effect on waterbird and shorebird energy expenditure. Some birds may flush and thus avoid direct contact with the amphibious operations, since there is abundant habitat adjacent to where the activity takes place. Because of the size of San Diego Bay and the oceanside amphibious zone compared to amphibious traffic patterns and the adjacency of nearby habitat for birds to escape to, any temporarily displaced birds have ample opportunity to settle elsewhere.

Flushing of birds is expected to be greatest with fast-moving amphibious landings, which are rare in SSTC training. While much of the potential interaction between birds and marine vessels is naturally avoided by use preferences as described above, there remains an effect that is likely concentrated during the winter period when avian use of the SSTC waters is concentrated and the migrants are more vulnerable because of their need to rest and replenish their food energy supply. Due to a large area of available habitat in proportion to the area of interface between vessels and birds, this effect is considered short-term. While such flushing or other effects of amphibious activity on individual birds may occur, none of these effects are long-lasting, and none are expected to have an adverse effect on migratory birds at the population level.

### Beach Activities

Beach activities take place on the training beaches above the low tide. They may take place on both the soft and hard pack sand. As discussed below, different activities could have different levels of impact on the beach areas utilized by birds. Due to the limited locations where personnel and vehicles can enter onto the beach and extra time required to transit along the beach, training with heavy foot traffic and/or vehicle usage is often selectively scheduled on certain beach lanes, which also traditionally have low nesting densities.

#### Fluid Transfer

Fluid transfer training events involve two activities (1) the simulation of fueling transfers utilizing seawater and (2) the intake of seawater for desalination and the discharge of hypersaline brine back into San Diego Bay. Fluid transfer activities consist of transferring salt water to simulate fuel transfer, under the activity Offshore Petroleum Discharge System, Amphibious Bulk Liquid Transfer System, and bringing saltwater ashore for desalinization, under the activity reverse Osmosis Water Purification Unit (Activities 38, 39, and 50, see Table 2-1) and are described in detail in Section 3.7.2.2.3 of Marine Biological Resources. Components of these activities that may be located above the high tide line include Beach Party Teams and Safety and Logistical Vehicles. These activities are analyzed in Section 3.12.2.2.4. The in-water portion of fluid transfer includes the hose and associated vessels. These activities could impact a few foraging individual migratory birds or flocks by the presence of equipment and human activity that disrupts their foraging or roosting behavior. Birds could flush and move to adjacent habitat, with the area of activity becoming temporarily unavailable as for their use. However, this effect would be at the individual level and not the overall population level.

### Vehicle Use

Vehicle use on the beach during amphibious activities under the No Action Alternative consists of safety and logistical vehicles, bulldozers, four-wheel drive vehicle training, and amphibious vehicles on the shore, including AAV/EFVs and LARCs. Bulldozers are used to grade the beach, excavate sand, recreate hummocks, and push beached vessels that are stuck back into the water. Cranes are used to move equipment and boxes around. During equipment offloading, all types of equipment including LARCs can be offloaded, set up and operated on the beach. Beach party activities use vehicles for beach preparation, vessel rescue if one becomes breached, to deliver equipment, and to dig ravines or trenches using backhoes or bulldozers. Vehicle use is common to most of the activities that occur on SSTC; even activities that do not otherwise access the shore require on-shore vehicles monitoring for safety and logistical reasons.

As detailed in Appendix C, safety and logistical vehicles are utilized in the vast majority of training activities under the No Action Alternative. This activity consists of vehicles driving or sitting stationary on the beach from the best vantage point for the activity, and out of the way of other beach activities. If they are observing or supporting offshore activities they typically transit near the high tide line or on the hard pack sand between the crest and high tide line.

Equipment offloading occurs during two training activities, Maritime Prepositioning Ship Offload and Roll-on/Roll-off Discharge Facility (Activities 49 and 51, see Table 2-1). While only occurring two times per year under the No Action Alternative, this activity could take up a large area on the beach. Materials, equipment, and vehicles are unloaded from barge ferry sections onto the beach, and this activity always takes place on the SSTC-N beach lanes. The activity footprint includes the area used to store items on the beach. Depending on the amount of equipment to be offloaded, this staging and maneuvering area has the potential to impact an entire beach lane.

Bulldozers are also used on the beach to grade the beach, excavate sand, recreate hummocks, and push beached vessels that are stuck back into the water. They are used in 12 training activities in the ROI (Activities 25, 38, 39, 41-43, 45, 46, 48, 49, 51, and 52, see Table 2-1). Between one and two bulldozers are used typically for each activity that requires bulldozers for a total of 198 training events under the No Action Alternative.

Vehicle patrolling occurs approximately six times per year under the No Action Alternative for LARC V Operator Training (Activity 53, see Table 2-1). In this activity, operators learn to drive this amphibious vehicle on and offshore.

Potential effects on birds due to vehicle and heavy equipment use include short-term and temporary disruption of foraging, roosting, or nesting for both common and special status species. Habitat for foraging, roosting, or nesting may be temporarily unavailable due to occupation of the amphibious landing area and associated activities on the beach that could occupy a large footprint. Vehicle and heavy equipment use on the beach may result in substrate compaction and topographic modification of the beach surface. Much of this activity occurs below the high tide line and topography changes are typically reversed after the tide comes in. Continued use of the beach is likely to control vegetation, which may benefit some special status species, such as western snowy plover and California least terns. Vehicle noise can interfere with animal communication essential for reproduction. However, this noise is not likely to be much louder than the continuous noise of the surf, and people on foot may cause stronger behavioral reactions than people in vehicles (Larkin 1996).

Birds are less common on the sandy beaches compared to muddy or vegetated shores. Since amphibious activity is concentrated on the sandy beach, this partitioning along reduces the potential for impacts to birds. Nesting activity is also concentrated in the spring and summer, so this temporal separation also allows for some impact avoidance.

While much of vehicle and equipment use associated with amphibious landings occurs below the high tide line or on the sand road, and therefore away from nesting birds, activities that expand above the high tide line, especially those not on the hard pack sand road, could impact nesting, special status species including federally listed least terns and snowy plovers. Current training lane management practices minimize most adverse impacts, as evidenced by the very low incidental take history of the past 15 years of Navy management of these training areas to protect nesting least terns and snowy plovers. Other nesting species have benefited collaterally from these management measures.

Some vehicle effects are minimized, especially for safety and logistics vehicles, due to the routine use of a sand road that runs parallel to SR-75 and which is used by vehicles traveling to and from beach lanes. This reduces the amount of driving in nesting areas, and therefore reduces the impacts of vehicle usage on nesting birds. The majority of vehicle use is on established dirt or paved roads. While on the beach, vehicles often travel at relatively low speeds or are stationary. They could flush bird congregations, or crush a nest, but because of the small potential footprint of the vehicles, approximately 10 percent of the lane, the potential for damage is considered small. It is believed that birds habituate to the presence of vehicles to a certain extent, especially considering the local proximity of SR-75 and other vehicle activity.

Flushing of birds from roosting, foraging, or nesting is expected to be greatest with fast-moving vehicles. Due to a large area of available habitat in proportion to the area of interface between vehicles and birds, this effect is considered short-term.

The vehicle use associated with amphibious activities is likely to have some non-measurable effect on waterbird, shorebird, and seabird energy expenditure. Some birds may flush and thus avoid direct contact with the amphibious operations, since there is abundant habitat adjacent to where the activity takes place. Because of the size of San Diego Bay and the oceanside beach area compared to amphibious traffic patterns and the adjacency of nearby habitat for birds to escape to, any temporarily displaced birds have ample opportunity to settle elsewhere.

The likely effects on avian nesting and habitat modification of the beach are more long-term, and are considered moderate due to their frequency and footprint. While to some degree these effects are relatively permanent, nesting use of these same beaches continues in abundance by federally listed and other special status species.

While effects of vehicle use on individual birds may occur, none of these temporary effects are expected to have an adverse effect on migratory birds at the population level.

### Foot Traffic

Impacts from on foot training in the ROI are analyzed in several different ways. Depending on the type of activity involved, each activity may have a distinct footprint. Foot traffic is divided into Mine Countermeasures (MCM) beaching activities, beach camps, foot patrols, observation posts, visual observation, running and marching, reconnaissance, and raids, which are discussed in the following paragraphs.

MCM beaching activities occur during Mine Countermeasures (Activity 5, see Table 2-1), approximately 32 times per year under the No Action Alternative. They occur occasionally on SSTC-N, primarily at SSTC-S. This portion of the MCM activity occurs after the mine shape has been neutralized offshore and involves towing the mine to shore for follow-on procedures. Vessels and the mine itself remain on the hard pack sand. Personnel dragging the mine onto shore with a rope may walk up onto the crest.

Beach camps (Activity 48, see Table 2-1) are a fairly infrequent activity at SSTC but have a large potential footprint and impact. They occur only on the oceanside beach lanes and can take place at both SSTC-N and SSTC-S, occupying the entire beach of each lane they are assigned to. One 14-day training event takes place each year. The number of beach lanes requested varies, depending on the number of personnel that will take part in the particular camp. The content of this activity includes setting up a self-sustaining field camp. Mock aggressions may also be included.

Foot patrolling involves groups of individuals walking in single file line formation on the beach. Individuals typically patrol walking north and/or south (along the long axis of the beach). Patrols sometime include ambushes, which often include pop-ups or individuals that hide in designated places. When ambushed, patrolling individuals retreat and retain formation where possible. Foot patrolling and ambushes take place under six training activities annually during approximately 273 training events. These activities could occur on the SSTC-N oceanside beach lanes, with the rest distributed between SSTC-N bayside lanes, SSTC-S and the designated NASNI training area.

Beach crossing is fairly common and involves small groups on foot transiting across the beach. The groups typically transit in a line formation (may include multiple lines of personnel), and individuals may be carrying inflatable boats. This activity is analyzed separately from foot patrolling, ambush, and stalking because individuals are moving across the beach along a different axis (along the short axis). This results in a different footprint and potential impact. This activity could take place during five training activities under the No Action Alternative, during about 432 events per year, on the SSTC-N beaches and otherwise distributed across SSTC-S, bayside beaches, as well as the designated NASNI training area.

Observation posts involve individuals setting up two to three observation posts on the beach, approximately 10 x 10 square yards in dimension. Equipment and vehicles typically remain on the sand road or along the hard pack sand. Personnel will station the observation posts, and communicate and sneak between posts. The activity often includes coordinated attacks from the observation posts on a target, which is evaluated under the patrolling and ambush activity. Observation posts could take place 50 times per year under the No Action Alternative, 100 percent of the time on the SSTC-N beaches, and under one activity (32).

Visual observation could occur at SSTC-N, SSTC-S and NASNI. Individuals stand on the crest of the beach where they have a good view of the waves, offshore, and beach activities to observe and record their observations. Trainees are fairly stationary and therefore the activity does not cast a large footprint.

Running/marching takes place under six activities under the No Action Alternative (Activities 17, 68, 69, 71, 72, and 73, see Table 2-1) and consists of individuals or groups using the beach's varied sand conditions for physical conditioning. It typically takes place along the long axis of the beach in varied sand types depending on the type of conditioning desired. Individuals will run on the hard pack sand, along the crest where the sand is soft and challenging, and along the sand road at the back of the beach, which provides a medium level of difficulty. Under the No Action Alternative, physical fitness activities occur approximately 972 times per year, mostly at SSTC-N and otherwise at the SSTC-S and NASNI beaches. While training on beaches at SSTC-S during physical training runs (Activity 68, see Table 2-1), trainees may have a military working dog participating in the physical conditioning. The dogs are exercised on SSTC-N and SSTC-S beaches, and on tether while running. The dogs are trained to ignore wildlife, and to not relieve themselves while training, but any waste would be picked up afterwards if it were to occur. Military working dog physical conditioning is allowed at SSTC-N on the hard pack and sand road, but crossing the beach/dunes is only permitted just north of the demo pit. Military working dog exercise is allowed at SSTC-S year-round under five conditions:

- Handlers and dogs will enter and exit the beach at Camp Surf or the middle gate at SSTC-S.
- Only 1 military working dog can be on the beach at one time.
- Exercise will be primarily on the hard pack with occasional exercise on the soft sand above the mean high tide line.
- Exercise on the soft sand above the mean high tide line must be within 20 ft of the hard pack sand.
- To the maximum extent possible, handlers must remain a minimum of 30 m (90 ft) from markers that delineate the locations of plover nests. Outside of the nesting season (15 Sept through end of February), training may occur unencumbered.

Reconnaissance takes place approximately 187 times per year under the No Action Alternative, typically on the SSTC-N beaches. It consists of individuals possibly entering the beach area from the water, and reconnoitering the beach for potential aggressors as well noting characteristics about the beach to aid follow-on activities. It is generally conducted by two or three persons who will circuit the beach on foot to check for enemy aggressors prior to a larger group landing on shore.

Raids consist of groups of people entering the beach from the water, spreading out, hiding, and moving across the beach. This activity normally takes place in an east to west orientation (along the short axis of the beach) with troops moving inland from the water. Under the No Action Alternative, this activity occurs approximately 204 times per year, on SSTC-N ocean-side training lanes, SSTC-S and in the designated NASNI training area.

While often casting a nearly inconsequential footprint as individual activities, the volume of repeated activities adds up to the potential for effect when foot traffic becomes concentrated or repeated multiple times in the same location. There are four activities subsumed in the descriptions above that have heavy foot traffic: Amphibious Raid, Direct Action, Beach Camp, and Seahawk. The first two (Amphibious Raid and Direct Action) tend toward the beach. The latter three (Direct Action, Beach Camp and Seahawk) occupy the northern area of SSTC-S, with limited usage of other areas throughout SSTC if needed.

Personnel on foot in small groups can alter bird behavior, cause birds to avoid otherwise suitable habitat, or become stressed or expend energy in flushing that can ultimately affect reproductive success. Breeding season restrictions are in place under the No Action Alternative when foraging and nesting shorebirds and seabirds are present. Mostly upland or marsh species inhabit SSTC-S, and foot traffic could potentially become stressful to nesting species or waterfowl or shorebirds replenishing their energy reserves while on migration. Repeated disturbance by human presence or vegetation trampling could ultimately affect nest success. This effect is considered small because of the large inland area of SSTC-S allows for dispersal of the activities, the large proportion of the area that is vegetated with iceplant or grassland, and the concentration of foot traffic near roads and away from wetlands. Given the overall benefit of restricted public access, SSTC-S is expected to remain relatively quiet compared to neighboring properties. While effects of repeated disturbance by human presence or vegetation trampling on individual birds may occur, none of these temporary effects are expected to have an adverse effect on migratory birds at the population level.

The military dogs undergoing physical conditioning on beaches are in their final stages of training and are under visual, verbal, and tether control while typically running on the hard pack sand or elsewhere on the beach. As the military dogs are in their final stages of training and may not pursue or harass birds, they still may accidentally flush or disturb nesting birds, which could be detrimental to bird reproductive potential through energy expenditure and diversion from nesting duties. It is recognized in scientific literature that the mere presence of dogs can have a greater effect on nesting shorebirds than the presence of humans (Lord et al. 2001). For example, dogs off leash were a disproportionate source of disturbance to western snowy plovers compared to humans (Lafferty 2001; Lafferty et al. 2006). Similar observations have been made for nesting golden plovers, who increased their energy expenditure, decreased nest incubation time, and flushed more often due to the presence of dogs than of human recreationists (Yalden and Yalden 1990). In conservation areas of Australia, dog walking led to a decline in the number of birds and species diversity (Banks and Bryant 2007). Despite this recognized sensitivity to the presence of dogs, since the number of dogs and training events in avian nesting areas are few, and dogs are with a handler, the additional effect of the presence of dogs is considered minor and short-term.

### Manual Excavations

Manual excavations take place during 18 training events under the No Action Alternative, about 90 percent of the time on the SSTC-N oceanside beaches and otherwise at other areas in the training complex. Excavations consist of individuals digging trenches, latrines (which are not utilized by personnel), excavating, and concealing beached boats. Individuals will often excavate near the high tide line where the slope face makes the concealment easier. It is localized with a typically small (e.g., 10 x 10 yard) footprint on the beach. The effect to birds, if any, is expected to be minimal.

The effect of manual excavations on the beach is small scale and temporary because it has a small footprint (less than a fraction of one percent of the beach area), occurs in a naturally disturbed environment, and training land management reduces the exposure of nesting seabirds and shorebirds to the activity. The effect is also lessened because some of the excavations take place below the high tide line where there will be no effects to nesting birds, as they nest well above the high tide line.

### Pyrotechnics Including Simunitions and Blanks

Pyrotechnics include smoke grenades and flares as well as blasting caps. Blasting caps are used to ignite detonator cord during underwater detonation. Blasting caps and diver recall devices are used during approximately 180 training activities under the No Action Alternative; the available information does not allow for separation between these two devices (Appendix C). Smoke grenades and flares are used during approximately 760 training activities. The effect of pyrotechnics is considered minor because it is a short-term response that can only affect individual birds rather than a population (Bowles et al. 1995). It would have more effect on species from populations that are unstable and low in number compared to those that are relatively abundant. Long-lasting and repeated exposure could cause a bird to retreat from otherwise suitable habitat.

The effects of military noise on wildlife were reviewed by Larkin (1996). Noise affects wildlife differently from humans and the effects of noise on wildlife vary from serious to nonexistent in different species and situations. Pyrotechnics are known to result in bird dispersal because they are used as a tool in managing airport runways for bird-aircraft strike hazard (Blokpoel 1976). In many cases, such acoustic stimuli lose their effect as birds habituate to them (Larkin 1976). Flares and smoke are expected to have a SEL range of 60 to 65 dB at 50 feet (U.S. Army 2003). A greater effect is observed in species from populations that are unstable and low in number compared to those that are relatively abundant. Long-lasting and repeated exposure could cause a bird to retreat from otherwise suitable habitat.

Simunitions or blanks are used during many training activities on the SSTC. The use of live fire is not permitted, instead blanks and simunitions such as paint pellets (or paint balls) are used. Paintballs are similar to large round vitamin capsules or bath oil beads. The fill inside paintballs is non-toxic, non-caustic, water-soluble, and biodegradable, and is made of naturally occurring elements. It rinses out of clothing and off skin with mild soap and water. The skin of a paintball is most often gelatin, such as that used in making vitamins and many food products. There are some paintballs with a starch-like skin. Under the No Action Alternative simunitions or blanks would be used during 173 training activities in the ROI.

Since this activity mostly takes place inside of bunkers, the noise is considered less of an effect than the presence of human activity itself, and is considered negligible.

#### 3.12.2.2.5 Inland Activities

Inland activities are those that occur on the inland portion of SSTC-S. This includes individuals on foot and vehicle traffic on paved and unpaved roads, as well as manual excavations. Manual excavations on SSTC-S inland areas are typically done roadside. Restrictions on manual excavations are in place at the archeological site on the eastern boundary of SSTC-S inland (Section 3.13.1.5; Cultural Resources; Current Mitigation Measures). There are also restrictions barring excavations on the vernal pools. Individuals on foot may utilize the semi-developed area or buildings of the inland area or traverse off road for stalking or other on-foot activities. Off-road foot traffic in this inland area could potentially take place during 690 training events under the No Action Alternative. Activities that request the inland area as a training location could also potentially train at other SSTC locations.

Military dog training also takes place in the inland area of SSTC-S during Close Quarters Combat / Close Quarters Defense (Activity 64, see Table 2-1). These dogs are in the final stages of their training and are practicing the location of people hiding in bushes, buildings, or bunkers. As this is primarily training for an urban environment it takes place mostly inside the disturbed northern area of SSTC-S. The dogs (one dog trains at a time) are off-leash during the exercise but under strict verbal and visual control. They are trained not to pursue wildlife and to only bark when they have located their target object. The dogs are trained to leave wildlife alone, and to not relieve themselves while training, but this would be picked up afterwards if it were to occur.

The northern, disturbed area of SSTC-S contains foundations of a formerly-planned housing area, and is covered in iceplant and ruderal species. Other areas are grassland containing a high proportion of saltgrass typical of a marsh-upland transition environment, mixed with non-native annual grasses. Both of these environments are tolerant of disturbance. The semi-developed area with iceplant supports little bird use and few birds are observed here. The grassland supports grassland birds, such as foraging raptors and other coastal species adapted to this low-growing, open environment. Inland activities which are observed as small groups acting covertly are concentrated in the northern developed/disturbed area presently dominated by iceplant and have an existing road network, buildings, and bunkers. However, even if the small group activity disperses throughout close to 600 acres of inland area available, the activity is expected to have low impact on birds. A portion of the activities occur in wetland or semi-wetland areas or in low scrub where birds may be nesting and tend to be naturally more secretive in behavior. As the military dogs training at SSTC-S are in their final stages of training and will not pursue or harass birds in the inland area, they are not expected to have an impact greater than those trainees already present in the area. No activities are allowed in or near vernal pools under the No Action Alternative. The overall impact on birds is short-term and minor, and is at the individual and not population level.

### 3.12.2.3 Alternative 1 (Preferred Alternative)

Alternative 1 increases the baseline level of training, conducts existing routine training in additional locations within SSTC established training areas, and incorporates improved, but conditional, access to SSTC-N oceanside boat lanes and inland areas for training. Access to SSTC-N oceanside boat lanes (specifically Blue 2, Orange 1, and Orange 2) are provided under two separate criterion.

The first criteria is designed to allow usage of Blue 2, Orange 1, and/or Orange 2 in situations where a training lane(s) is needed and other similar training lanes are already occupied and unavailable for use. Under this criterion, SSTC-N beach training lanes Blue 2, Orange 1, and/or Orange 2 could be used during the California least tern nesting season if Beach Lanes Red 1 and 2, Green 1 and 2, and Blue 1 are being utilized and additional training lane(s) are needed for training. Lanes would be opened one at a time, based on need, with Blue 2 opened first, Orange 1 second, and Orange 2 last. Training will be preferentially scheduled for lanes with fewer nests, where appropriate. This means that activities occurring at the same time would be compared and, where appropriate, those that require use of larger beach areas would be preferentially scheduled on lanes that contain fewer nests.

The second criterion is designed to allow usage of Blue 2, Orange 1 and/or Orange 2 for training if attributes of Blue 2, Orange 1, and/or Orange 2 make those lanes more suitable for meeting training needs than other available training lanes. Examples of lane attributes which may allow usage of Blue 2, Orange 1 and/or Orange 2 include but would not necessarily be limited to: nearshore in-water conditions such as the presence of sand bars or holes, beach conditions such as slope and depth of the beach, distance from other training activities occurring on the SSTC-N oceanside beach and boat lanes, and a need for diversity in training locations.

Modeling conducted to predict lane usage under Alternative 1 predicted that in an average year, an anticipated 24 training activities that require use of the beach above the high tide line would be scheduled in Lanes 8 to 10 during the least tern and snowy plover nesting season. See the analysis presented in Section 3.12.3.1 for the California least tern for further information on this estimation.

The Navy is also proposing a limit to the number of western snowy plover nests that will be marked with stakes for avoidance on SSTC-N and SSTC-S oceanside beaches. The Navy is proposing to stake up to 22 nests at one time for avoidance on its oceanside beach lanes, which generally translates into two nests on each lane except for Yellow 1, Green 1 and Green 2 which have not historically contained plover nests, plus any additional nests that are initiated in beach lanes Orange 1 and Orange 2. Two nests in each of the remaining 11 lanes, while still encumbering the training area, allow the lanes to be used for training, and continue to provide protection for the western snowy plover. Staking would continue to be a 30-meter or less diameter buffer around the plover nests. If more than 22 western snowy plover nests are established in the oceanside SSTC training lanes at one time, those in excess of 22 at one time would not be buffered, excepting those initiated in Orange 1 and Orange 2. This does not mean that mortality to the nonbuffered nests would necessarily occur, just that they would not be staked for avoidance.

This change in management of the SSTC-N Beach Lanes Blue 2 through Orange 2 would affect the beach and dune complex of species by allowing increased potential for foot and vehicle traffic both outside and inside the avian breeding season. Beach lanes Blue 2 through Orange 2 would be opened for training as necessary under Alternative 1. In addition, the general increase in training tempo could affect shorebirds, waterfowl, seabirds, and neotropical migrants and residents of SSTC-S and the beach and dune complex.

The Navy is in the process of consulting formally on these proposals with the USFWS under Section 7 of ESA. Results of the consultation will be memorialized in a subsequent BO and INRMP updates.

#### 3.12.2.3.1 Air Activities

The types of air activities proposed for Alternative 1 are consistent with those described under the No Action Alternative, although the frequency would increase and five new activities would be conducted (Activities N4 – N8, see Table 2-2). Though helicopter activities over San Diego Bay and ocean waters within the ROI would increase from 724 activities under the No Action Alternative, to 1,262 annual activities under Alternative 1 (Appendix C), the majority of activities occur offshore and would have minimal effects on resident or migratory birds. Helicopter landings would increase from 4 to 40 activities under Alternative 1.

A 10-fold increase in helicopter landings and take-off would not result in a measurable increase in soil compaction, vegetation crushing, or flushing of birds because the activity occurs at multiple locations and only occasionally does a helicopter landing, and then using specially-designated offshore and inland drop zones. Grasslands and iceplant vegetation of the SSTC-S inland are tolerant and recover readily from trampling. A small area of crushed vegetation could result from take-off and landing activities, but coastal sage scrub, which would be the most sensitive to crushing, is not likely to be a choice for helicopter takeoffs and landings because it is usually located on a slope and contains plants unfavorable to a troops landing, such as cactus and thick brush. The temporary and short-duration effects of landing and takeoff would be limited to sand blow and flushing of mobile birds that may be at the landing area.

In the inland area of SSTC-S, both resident breeding and migrant birds may startle and run or fly off, expending energy that would affect reproductive success in the long term. Considering that SSTC lies beneath a helicopter flight line and that the activity already takes place under the No Action Alternative, resident birds may have habituated to helicopter noise. There are numerous intermittent acoustic sources that the animals encounter, such as ocean swell noise, weather/thunder, or vehicular noise from SR-75; the propensity to habituate may be increased with exposure to other intermittent noise sources.

Effects to federally listed nesting species are avoided because resource management practices would continue to be implemented under Alternative 1 and include training restrictions in the nesting area. The effect of air activities is considered negligible and no long term impacts would occur as a result of implementation of Alternative 1.

#### 3.12.2.3.2 Marine Vessels

Marine vessels, self propelled and power-driven, would increase in use and scope under Alternative 1 compared to the No Action Alternative. Seven new activities involving marine vessels would be added under Alternative 1 (N1, N2, N3, N4, N6, N7 and N9, see Table 2-2). The total number of vessels varies per activity (see Appendix C), but multiplying the number of vessels by the number of events in which they are used, and summing over all the activities, results in an approximate number of 12,304 vessels used per year. Assuming training occurs only on weekdays, the average number of marine vessels utilizing the ROI per weekday would be 34 vessels performing varying activities. The greatest increases to marine vessel activities would be attributed to new activities (see Table 2-2): SWAG (Activity N1), Surf Zone Test Detachment (Activity N2), and towed Organic Airborne Mine Countermeasures systems (Activities N4, N6, N7), as well as increases to existing activities (SEAL Delivery Vehicles [SDV]/ Advanced SEAL Delivery System Certification training and Barge Ferry/Causeway Coxswain training [Activities 37 and 40, respectively, see Table 2-1]). Implementation of Alternative 1 would result in similar effects to avian resources from LCAC landings as previously described under the No Action Alternative as no additional landings are proposed under Alternative 1. The increase in use of small vessels, especially jet-driven craft, in nearshore areas would increase the propensity for bird flushing and may affect reproductive capability of affected species, especially waterbirds. However, this effect is small and not quantifiable, with an increase of approximately eight vessels per weekday.

#### 3.12.2.3.3 Underwater Detonation

Underwater detonations occur in shallow water (less than 72 feet) within oceanside training lanes and the shock waves propagate over a mostly homogeneous sand substrate. As presented in Section 3.8.2.2.3 and 3.8.2.3.3 of Marine Biological Resources (see Table 3.8-10 and Table 3.8-11), underwater detonations would increase measurably from 103 activities under the No Action Alternative to 311 activities under Alternative 1. Under Alternative 1, five additional activities would be conducted: Shock Wave Action Generator (SWAG), Unmanned Underwater Vehicle Neutralization, Airborne Mine Neutralization System, Demolition Requalification and Training/Underwater Detonations, and Naval Special Warfare Underwater Demolition Training (Activities N1, N3, N7, N9, and N11, respectively, see Table 2-2) and the footprint of activities would be expanded to include SWAG detonations of up to 15 grams NEW within San Diego Bay.

Current mitigation measures associated with underwater detonation (Section 3.12.1.5.3) would be continued under Alternative 1, including additions to mitigate for the effects of the new activity, SWAG. A safety buffer zone of 180 feet will be established around each SWAG detonation point. Lookout(s) with binoculars and small craft will survey the detonation area and the safety buffer zone for birds from at least 10 minutes prior to commencement of the scheduled explosive event until at least 10 minutes after detonation. If a bird is sighted within the buffer zone or moving towards it, activities will be suspended until the animal has voluntarily left the area and the area is clear of birds for at least 10 minutes. Immediately following the detonation, visual monitoring for birds within the buffer zone will continue for 10 minutes. Any animals appearing will be observed for signs of injury. Injured animals will be reported to the CNRSW Environmental Director and the PACFLT Environmental Office.

While the observation distances utilized during monitoring are designed for marine mammals, these mammals require a greater distance than birds to be protected from injury (Yelverton 1973). The underwater detonation proposed for bayside areas are small, directed, and confined, and are unlikely to result in impacts to birds. Considering the relatively small and directed size of the proposed bayside detonations, it is likely that fish forage may be temporarily displaced but however not killed by this expanded footprint. Eelgrass will not be impacted by the expanded bayside underwater detonations because the detonation takes place midwater and not in the eelgrass beds.

#### 3.12.2.3.4 Amphibious and Beach Activities

Amphibious and Beach activities increase by varying degrees under Alternative 1; these differences are detailed below.

##### Amphibious Activities

ELCAS and causeway beaching activities would increase from 12 to 16 training activities under Alternative 1, but remain in the same locations. Due to mitigation of eelgrass impacts (discussed in Section 3.7) and other Navy management measures, effects to birds are avoided or minimized. The addition of three causeway-related activities would be considered minimal due to mitigation measures already in place. Eelgrass impacts and Navy mitigation for these impacts are described in Section 3.7.1.4.3 in the chapter on Marine Biological Resources in this document.

##### Beach Activities

###### Fluid Transfer

Fluid transfer activities increase by one event annually to 15 events per year under Alternative 1. This increase does not represent a quantifiable increase in effect on migratory birds in the ROI; the increase is considered negligible.

### Vehicle Use

In addition to an increase in safety and logistical vehicle use of approximately 29 percent from 3,034 to 3,921 times of use per year, vehicle patrolling would increase as well, from 6 to 56 events per year under Alternative 1. Equipment offloading would double from two occurrences per year to four of these five-day activities under Alternative 1. Bulldozer use would increase by 22 percent during 226 training events versus 202 under the No Action Alternative.

The increase in vehicle use between the No Action Alternative and Alternative 1 would impact migratory birds through the same mechanisms as described under the No Action Alternative, but to a somewhat greater degree. There is increased possibility of a general degradation of habitat value due to the increased interface of birds and humans with vehicles and equipment, which may cause birds to abandon certain otherwise adequate habitats for less disturbed areas. Additional flushing, noise, and sometimes nest impacts associated with vehicles and equipment may be tolerated due to the abundance of habitat available. There may be increased substrate compaction and topographic modification of the beach surface. However, like in the No Action Alternative, much of this activity occurs below the high tide line and topography changes are typically reversed after the tide comes in. Continued use of the beach is likely to control vegetation, which may benefit some special status species, such as western snowy plover and California least terns. Vehicle noise can interfere with animal communication essential for reproduction. However, this noise is not likely to be much louder than the continuous noise of the surf, and people on foot may cause stronger behavioral reactions than people in vehicles (Larkin 1996).

Impacts are also minimized by the natural partitioning of migratory birds in favor of mudflats over sand, seasonal preferences, as well as operator preference for the western third of oceanside training areas nearest to the shore. The likely effect would be most notable for nesting species that use the sand and dunes in spring and summer.

Vehicle patrolling and operator training could have a large footprint on the beach. Degradation of habitat value is possible for nesting, loafing, and foraging special status migratory birds that these and other beach, dune, and beach wrack areas. However, this impact is mitigated through concentrating the most intense vehicle use, Vehicle Patrolling and Testing, to beach training lanes Yellow and Green that have historically had minimal nesting due to beach depth and beach modifications.

All of the effects described are to individual birds or bird groups. None are expected to occur at the population level to migratory birds.

### Foot Traffic

As described in Chapter 2 (see Table 2-1), MCM beaching activities would increase to 58 events per year under the No Action Alternative. Beach camps would double to two events per year and foot patrolling would increase to 472 events per year. Over the beach crossings would increase to 480 events per year. Observation posts would increase 68 percent to 84 events per year. Visual observation activities stay almost the same, increasing from 156 to 160 events per year. Running and marching would increase by four events annually under Alternative 1, to 976 events. Reconnaissance activities would increase to 396 events per year. The number of raids and ambush activities would remain the same under Alternative 1 as under the No Action Alternative.

While seeming to cast a nearly inconsequential footprint as individual activities, the volume of repeated activities could add up to effects on nesting species when foot traffic becomes concentrated, repeated multiple times in the same location, or if it results in nest abandonment of ground-nesting birds or inland birds in the dunes or shrublands. There are four activities subsumed in the descriptions above that have heavy foot traffic: Amphibious Raid, Direct Action, Beach Camp, and Seahawk. The first two

(Amphibious Raid and Direct Action) occur mostly on the beach. The latter three (Direct Action, Beach Camp and Seahawk) occupy the northern area of SSTC-S, with limited usage of other areas throughout SSTC if needed.

The increase in foot traffic at SSTC-S will likely result in an increase in disturbance to birds. Foot traffic may be more disturbing to birds than vehicles because birds can habituate to vehicles more easily (Larkin 1996). In addition, the proposed tempo increase at SSTC-N combined with improved access to training beaches would be expected to have a small net increase in disturbance of birds. The effect is considered moderate due to the presence of many special status birds during vulnerable parts of their life cycle, but of short duration and temporary.

#### Pyrotechnics Including Simunitions and Blanks

Under Alternative 1 the use of smoke grenades and flares would be used during approximately 858 training activities. The use of blasting caps and diver recall devices would be used during 1,293 training activities during Alternative 1. The use of simunitions and blanks would increase to approximately 251 activities of training per year. The effects of simunitions would be the same or less than that associated with firing of pyrotechnics. The noise level between pyrotechnics and blanks is expected to be similar, while quieter for simunitions. Noise is considered less of an effect than the presence of human activity itself, and the increase in activities with Alternative 1 is negligible, considering that effects to nesting birds are avoided by training lane management at SSTC-N.

#### Manual Excavations

Under Alternative 1, manual excavations would increase to 52 total activities conducted per year. The effect of manual excavations on the beach would be minor and temporary because they occur in a naturally disturbed environment, and training land management reduces the exposure of nesting seabirds and shorebirds to the activity until nesting thresholds are reached. The effect would be lessened as much of the excavation takes place near the high tide line where there will be minor effects to nesting birds, as they nest away from the high tide line. It is also above the beach wrack line and the wet sand, so will not affect foraging resources. The beach slope itself may also act as a visual or physical barrier between the nesting birds above the crest. The potential remains for occasional disruption. However, any effect to migratory birds would be at the individual rather than the population level.

### 3.12.2.3.5 Inland Activities

Inland activities are those that occur on the inland portion of SSTC-S. This includes individuals on foot and vehicle traffic on paved and unpaved roads, as well as manual excavations. Manual excavations on SSTC-S inland areas are typically done roadside. Restrictions on manual excavations are in place at the archeological site on the eastern boundary of SSTC-S inland (Section 3.13.1.5; Cultural Resources; Current Mitigation Measures). There are also restrictions barring excavations on the vernal pools. Individuals on foot may utilize the semi-developed area or buildings of the inland area or traverse off road for stalking or other on-foot activities. Off-road foot traffic in this inland area could potentially take place during training events under Alternative 1.

A portion of these activities take place in a semi-developed area of SSTC-S consisting of foundations of a formerly-planned housing area covered in iceplant and ruderal species. Other areas are grassland containing a high proportion of saltgrass typical of a marsh-upland transition environment, mixed with non-native annual grasses. Both of these environments are tolerant of disturbance. The semi-developed area with iceplant supports little bird use and few birds are observed here. The grassland supports grassland birds, such as foraging raptors and other coastal species adapted to this low-growing, open environment. Inland activities are expected to have low impact on birds because small groups act covertly and disperse throughout the large inland area of the ROI. A portion of this activity occurs in wetland or semiwetland areas or in low scrub where birds may be nesting and tend to be naturally more secretive in behavior. The overall impact on birds is short-term and minor, and is at the individual species level and not at the overall population level.

Natural resource agencies such as the USFWS have been concerned for many years with construction and operation noise impacts to birds, especially to species listed under the ESA. The 60 dB (A-weighted) Leq (1 hour) criterion is usually applied as a threshold to assess impacts (James 2006); however, the criterion was based on incidental observations of least Bell's vireo nests along SR-75 and not a directed study (Barrett 1997). There are no specific noise standards set by the USFWS for the California least tern or the western snowy plover, or other special status species in the ROI. However, the noise standard set for nesting sites of other southern California threatened or endangered species (i.e. California gnatcatcher, least Bell's vireo) is the 1 hour Leq of 60 dBA (County of San Diego 1980). The generally accepted definition of excessive noise is an increase of 10 dBA or greater.

Noise pollution can interfere with the auditory signals birds rely on by making those signals inaudible, changing their perceived location, or reducing the distance over which the signal can be heard or interpreted. Birds depend on these signals for a variety of activities: contacting mates, warning of danger, monitoring their young, and detecting predators. The background noise produced by traffic, with its effect on birds' communication abilities, can render an otherwise suitable nesting area unsuitable. Under the ESA, this qualifies as degradation of habitat.

Sometimes animals become habituated to increased noise levels and apparently resume normal activity; however, birds and other wildlife that communicate by auditory signals may be at a disadvantage near roads, such as SR-75. Such highway noise can also disrupt territory establishment and defense and communication, with Endangered Species Act implications in a few cases. The greatest effects of transportation on wildlife have been documented from off-road vehicles (Bondello 1976, Bondello and Brattstrom 1979; Bunnell et al. 1981) and overhead flights. (Bunnell et al. 1981; Fletcher 1980). The effects of highway noise on bird populations have been studied in the U.S., particularly in California, and with regard to multiple species' breeding success in the Netherlands (Reijnen et al. 1997). Changes in breeding patterns and densities for 43 species of birds were examined in that study. Researchers examined pairs of nesting sites, with one near a busy road and one distant from it. Sixty percent of the species analyzed showed evidence of reduced densities close to the roads. The distance over which the effect was observed depended how busy the roads were: 10,000 cars a day affected birds up to 1.5 km from the roads; 60,000 cars a day affected birds up to 2.9 km from the road. For a zone of 250 m from the road the reduction of the density varied from 20 to 98 percent.

In a Marine Corps-sponsored study, the Hubbs-SeaWorld Research Institute (2006) studied the effect of helicopter noise on the coastal California gnatcatcher at Marine Corps Air Station (MCAS) Miramar. MCAS Miramar initiated a four year study to study the effects of helicopter noise and a one-year follow-up study to monitor reproductive success.

In order to separate natural from anthropogenic effects on nesting success of the gnatcatcher for this study, in addition to a suite of noise metrics a variety of factors were quantified including vegetation structure and composition, disturbance rates, predator density, distance to roads, geographic indices and climate. Data collected were used to test the null hypothesis of no adverse effect to nesting success rates, fledgling production rates and nest site selection patterns due to changes in helicopter noise levels.

Coastal California gnatcatcher nests were monitored for nesting productivity. Nests were monitored in 1998, 1999, 2000 and 2001 resulting in 421 nests available for analysis. Data was available from previous coastal California gnatcatcher studies and the metrics were consistent, so analysis was conducted on 760 nests monitored from 1995 through 2001. A nest was considered successful if it fledged one young.

Model results for predicted probability of nest success, predicted probability of nest site selection and predicted number of fledges per pair show that the coastal California gnatcatcher will find and inhabit suitable nesting habitat, in spite of the noise environment recorded at MCAS Miramar. Nest success was equally likely in quiet and noisy areas within the MCAS Miramar. After adjusting for spatial variation with habitat, nest site selection patterns were not associated with noise levels.

It is difficult to translate the gnatcatcher data results with regard to helicopters to all classes of birds including shorebirds and seabirds to the noise of training such as aircraft overflights, weapons, pile driving, and vehicles and equipment on the beach due to the variability of responses of differing species to a variety of stimuli. The effect of noise from such training activities could be most pronounced on birds that breed locally, which includes marsh birds, resident songbirds, foraging seabirds including the California least tern and other terns, and certain shorebirds including the western snowy plover. Although sustained exposure to continuous noise at or exceeding this level could be damaging, the noise expected is momentary; this exposure would not be expected to cause physiological damage or hearing loss to birds. At the moment of impact, most other sounds, such as bird songs, including contact calls from conspecifics or mates, and songs that attract mates, would be momentarily masked. In between impacts, noise levels would resume typical background levels (the high ambient surf noise levels are estimated to be 63 to 69 dBA Leq). Therefore, while some effect is likely, no long-term habitat degradation for the listed species and migratory birds nesting or foraging effects would be anticipated.

### 3.12.2.4 Alternative 2

Alternative 2 increases the level and types of training within the ROI to the exact same degree as under Alternative 1. Differences in training lane access do occur between the alternatives, such that all SSTC-N surfside beach training areas would be available for use under Alternative 2, regardless of time of year, and not dependent on criteria as in Alternative 1.

#### 3.12.2.4.1 Air Activities

The change in lane access restrictions under Alternative 2 would affect the placement of air activities such that they would be allowed to access Beach Lanes Blue 2 through Orange 2 throughout the year, creating more of an impact in these lanes but less of an impact in other oceanside training lanes. It is expected that the effect on avian resources in the ROI from Alternative 2 would not be different from those described under Alternative 1.

#### 3.12.2.4.2 Marine Vessels

The modification of beach lane management would only change the potential impacts of this activity as it concerns boat beaching, because it would be allowed year-round on all the SSTC-N beach lanes. As such, the effects of marine vessel beaching may be more diffuse under Alternative 2 as opposed to Alternative 1. Effects from water-only marine vessel activities would remain the same under this alternative because all SSTC-N boat lanes are available for use year-round under all alternatives.

#### 3.12.2.4.3 Underwater Detonation

The modification of beach lane management would not change the potential impacts of this activity, as increased beach access would not change the areas in which underwater detonations could occur. As such, the effects of underwater detonations are the same as discussed under Alternative 1.

#### 3.12.2.4.4 Amphibious and Beach Activities

##### Amphibious Activities

There could be a potential difference in the on-shore effects of amphibious activities between Alternative 1 and 2 in that additional SSTC-N beach lanes would be open for access year-round. Since the number and types of training would remain the same under Alternative 2, avian resources in the additionally opened lanes would be impacted more while resources in other oceanside training lanes would experience less training pressure.

##### Beach Activities

All beach activities would have a similar change in impact in Alternative 2 as opposed to Alternative 1. There could be a potential increase in activities in lanes Blue 2 through Orange 2, which would be opened for year round training under Alternative 2. Any increase in impact in these lanes would be accompanied by a decrease in training pressure in other SSTC-N training lanes.

#### 3.12.2.4.5 Inland Activities

There is no difference in effect to avian resources from inland activities at SSTC-S between Alternatives 1 and 2. Levels of on foot training remain the same as under Alternative 1, thereby having the same effect on resources in the inland area.

### 3.12.3 Federally Listed Species Impacts

Effects to listed species as a result of each alternative are discussed below.

### 3.12.3.1 California Least Tern

Due to the high density and differential nesting of California least tern nesting activity on the SSTC-N oceanside beaches (Beach Lanes 1-10), and the complicated nature of military training schedules on the beaches, models were developed to project the direct impact of training on California least tern nests on these beaches. Three separate models were developed. The first model simulation generated daily schedules of activities based on types of training and training tempos. These daily schedules were then inputted into a second model that assigned training activities to specific SSTC-N oceanside training lanes. Finally, a third model was developed and used to calculate the amount of beach area impacted by training in each of the lanes and the estimated loss of California least tern nests on these lanes. The models estimate take for highly intense training years, and were then used in combination with historical take data to estimate take for average/typical training years. The modeling and estimation processes are described in the following paragraphs.

**1. Generating Daily Schedules for Future Planned Training**

As previously discussed, the first model was developed and run to generate projected training schedules. Data was collected from activities that were conducted during the nesting season (April 1 through September 15) in 2006. The activities were grouped in four broad categories that drive how they are scheduled into training lanes. The data was then used to calculate means and standard deviations for training activity start time and duration for each category. This statistical information was then applied to the training types and tempos proposed under the No Action Alternative, Alternative 1 and Alternative 2, and input into a MATLAB model to generate simulated activities and future schedules.

### 2. Assigning Activities to Training Lanes

The second model was developed and run to assign simulated training events to specific training lanes on SSTC-N. The model functioned by receiving a request for a certain number of lanes for a training event and slotting that training into available lane(s). Rules for scheduling each of these activities were defined based on the specific training needs particular to the training activity. These scheduling rules are and would continue to be influenced by factors such as available beach access points, beach and very shallow water topography, safety of the students involved in the training, distance from public areas, and isolation from other training occurring at the same time.

Rules that allow some activities to use training lanes at the same time were also integrated into the model. Overlap of activities depends on a variety of factors, including safety of personnel and equipment, the need for isolated areas during training to simulate realistic environments and training, and the specific portion of the beach lane required for training.

There was inherent conservative bias in the model. For instance, the model did not fully account for the likelihood that organizations share command resources and would in some situations purposely schedule their activities back-to-back, which reduces the potential for scheduling conflict. It also does not fully account for the fact that a single group cannot schedule two activities using the same students at the same time. These and similar scheduling phenomena have the effect of reducing the number of lanes used in any given day, concentrating lane usage to lanes that typically have the least number of nests. It also reduces the likelihood that Lanes 8, 9, and 10 (Blue 2 through Orange 2) would need to be used in Alternatives 1 and 2.

The models were run 1,000 times for the No Action Alternative, Alternative 1 and Alternative 2 scenarios. Standard deviations were evaluated to ensure that variation in the results between model runs would not under or over represent impact results. The models found that Lanes 8, 9, and/or 10 would need to be used under the average and highly intense training scenario for Alternatives 1 and 2, due to the proposed increase in training tempo.

### 3. Incidental Take Analysis for Highly Intense Training Scenarios Considering Specific Activities and Tern Location in SSTC-N Oceanside Lanes

A third model was developed to calculate the direct impacts of training on California least tern nests within the SSTC-N oceanside training lanes in a highly intense training scenario. Estimated impacts were calculated first by determining the footprint of each training activity that would enter into areas where California least terns nest. About 20 feet inland of the high tide line is a beach feature called the crest. This feature is where the beach noticeably changes slope and becomes more horizontal. Least terns nest from this crest inland towards the SR-75, approximately 175 yards. Tern nesting is somewhat biased towards the crest than the highway, and this was considered in the impact analysis.

Neither least terns nor training activities are evenly spread between the SSTC-N oceanside beaches. The analysis of effect accounted for this differential nesting of terns on each of the oceanside beaches of SSTC-N. Training was assigned to lanes based on training needs, as discussed above. Training activities were then evaluated to determine whether they would occur in the nesting area or outside the nesting area (e.g. they may occur below the high tide line outside of the nesting area when the tide is out), and how often they would occur in the nesting area.

Once the location of the training and footprint were established, impacts to beach areas were multiplied by the number of training events that occur when nests are present on the SSTC-N oceanside beaches. The likelihood of overlapping use of beach areas during training was considered in the model. The total footprint of training on each beach was then overlaid on the potential nesting area (from the crest to 175 yards inland) to estimate the potential for direct impact to California least tern nests.

Conservative assumptions were made throughout this modeling procedure, including the usage of the highest historical number of nests on the beaches at the time the model was developed (years 2006 and 2007) to calculate potential impacts of training. The model also assumes no avoidance of trainees by birds. This and other conservative assumptions bias the results higher than may be seen in a typical year, and make the results more representative of a highly intense training scenario.

Modeling for the highly intense training scenario conservatively estimated that 88 California least tern nests would be directly impacted annually under the No Action Alternative, 105 California least tern nests under Alternative 1, and 156 nests under Alternative 2.

**4. Incidental Take Analysis for Average/Typical Scenarios Considering Historical Take**

The average or typical incidental take that might be experienced under the No Action Alternative was estimated by averaging the actual historical take levels for the years 2005 through 2009 determined through onsite monitoring during those years (Table 3.12-6). Data from 2005 through 2009 were included in the calculation because during this time the Navy had maintained the same management strategy of setting aside Lanes 8-10 for nesting. Due to varying management strategies, historical take data prior to 2005 would not be representative of the No Action Alternative and was not considered. To convert historical take of eggs and chicks to take of nests, a factor of 1.67 eggs or chicks per nest was used. The 1.67 factor was based on monitoring data of the average least tern clutch size at SSTC averaged for the years 2005 through 2009. Average incidental take was thus estimated to be 38 nests annually under the No Action Alternative.

Based on this analysis, the average incidental take for the No Action Alternative (38 nests) was approximately 2.3 times lower than the highly intense training scenarios estimate of incidental take (88 nests). This lower ratio of actual to highly intense (2.3 times less) was applied to the modeled highly intense take results for Alternatives 1 and 2 (105 and 156 nests, respectively) to generate an average estimated take for those Alternatives. Under Alternative 1, 45 nests are expected to be taken and under Alternative 2, 67 nests are expected to be taken in an average, typical year.

### 3.12.3.1.1 No Action Alternative

Modeling for the No Action Alternative discussed above considered that training activities would not be scheduled in Blue 2, Orange 1, or Orange 2 training lanes during the nesting season. It also considered that training activities with the largest footprint on the beach would be preferentially scheduled for the lanes with the fewest nests.

Historical average takes of California Least Terns can be used to provide a representation of estimated future takes under the No Action Alternative. Historical takes between 2005 and 2009 averaged 38 nests being directly impacted annually, potentially due to military training on SSTC-N Beach Lanes 1-7 (see Section 3.12.3.1). Modeling for the highly intense training scenario of the No Action Alternative conservatively estimated that 88 California least tern nests would be directly impacted annually (see Section 3.12.3.1 for modeling methodology). All birds present would be potentially subject to disturbance.

Nesting activity has increased despite the average historical annual loss of 38 nests (Figure 3.12-9), indicating a capability of the species to not only continue to persist on SSTC, but also to increase, with training occurring in the nesting beaches during the nesting season. Much of this has to do with the Navy's mitigation measures and management practices discussed below. Also, as discussed in Section

3.12.1.3.1, the most recent population viability analyses have determined that 5,000 breeding pairs would sustain a safe rangewide population of California least terns (USFWS 2005). Converting these pairs into nests using 2006 Navy nest per pair data (1.1443 nests per pair in Naval Base Coronado) translates 5,000 breeding pairs into 5,722 nests. Loss of an average of 38 nests annually would not decrease existing nesting levels (8,173 nests in 2006) below this 5,722 nest level. Table 3.12-12 indicates the level of authorized and actual take of least terns since 1999. Average loss of 38 nests falls well within the USFWS 2007 take allowance of 455 nests. The BO stated that the take exemption is not likely to actually occur, as it has not in the history of Navy management of the SSTC beaches.

**Table 3.12-12: Incidental Take Allowance and Actual Take for California Least Tern on Navy Beaches in the ROI**

| Year | Incidental Take Allowance | Actual Take (eggs and chicks) |
|---|---|---|
| 1999 | 20 eggs/chicks | 1 |
| 2000 | 20 eggs/chicks | 3 |
| 2001 | 20 eggs/chicks | 6 |
| 2002 | 75 eggs to rear in captivity, 30 eggs to relocate | 58* |
| 2003 | 68 nests or 135 eggs/chicks | 72* |
| 2004 | 129 nests or 387 eggs/chicks | 16 |
| 2005 | 263 nests | 38 |
| 2006 | 263 nests | 23 |
| 2007 | 455 nests | 42 |
| 2008 | 330 nests | 30 |
| 2009 | 330 nests (extension of 2008 take allowance) | 53 |

*This includes 50 eggs in 2002 and 51 eggs in 2003 removed from training areas and taken to Project Wildlife or SeaWorld for captive rearing.

As discussed in Sections 3.12.1.5.2 and 3.12.1.5.3, the Navy has a comprehensive program to protect, manage, and mitigate for impacts to sensitive natural resources on SSTC, with particular attention to nesting birds listed under ESA. The following is a discussion of the Navy's current and historical mitigation and management efforts, and their beneficial impacts on California least terns. The discussion looks at each management practice individually and considers its potential beneficial impacts on the species. Many mitigation measures are interrelated and beneficial impacts may in some cases be interconnected. For this reason, not all of the individual impacts discussed below can be directly summed with others to calculate an overall total beneficial impact.

***Historical Mitigation***

The Navy made physical investments in the Delta beaches in order to offset the potential effects of training on the oceanside beaches, starting with the 1997 BO on training on NAB Coronado beaches, when 91 nests on the oceanside beaches were addressed. These enhancements increased the capacity of the Delta sites to support both least terns and snowy plovers through site expansion and associated vegetation control, establishing chick barriers and chick shelters, trash removal, and using decoys. Physical enhancements included:

- Approximately 45 acres of additional carrying capacity have been added to Delta North and South and set aside as habitat during the nesting season, beyond what was previously committed to as mitigation for past projects. An estimated 34.1 additional acres of habitat on Delta North and South were established for nesting in addition to what was required for offsetting NASNI helicopter maintenance facility. Additional capacity was achieved between 1996-2005 by placing a four foot sand berm along the northern end and a portion of the eastern shoreline of North Delta to protect tern nests in areas prone to flood at high tides. In 1996, Delta Beach South was enhanced by expanding the 10 acre nesting site area to 15 acres by adding 1,000 $yards^3$ of sand, placed in the center portion of the site. Starting in 2002, voluntary enhancement of 4.3 acres (south of a fence that was removed to improve accessibility to plovers) provided an additional 4.3 acres of habitat. Delta North and South have had an average California least tern density of 5 nests/acre and 3 nests/acre between 2005 and 2009, respectively. The additional 45 acres of additional carrying capacity on Delta North and South is estimated to have provided 198 additional protected nests not previously committed to under past projects (34.1 acres*5 nests/acre on Delta North + (5.0 + 4.3 acres)*3 nests/acre on Delta South). Both sites, particularly Delta South, have a potential for higher tern nesting densities, and can support even more nests in the future. This increased carrying capacity can by itself mitigate for all anticipated training impacts to California Least terns on SSTC under the No Action Alternative, Alternative 1, and Alternative 2. The Navy continues to maintain these additional 45 acres, including predator control and site preparation, to encourage nesting:

- Fences were built or replaced at NAS North Island (1992) and the south edge of the South Delta Beach (1994) tern colonies. The fence at South Delta beach was added to restrict recreational access from the adjacent Fiddler's Cove Marina, and was later removed to improve access for western snowy plovers.

- Power lines that parallel Delta Beach along Highway 75 were placed underground in 1997 to reduce the presence of predator perches, which also eliminated the possibility for least tern mortality due to impact with overhead wires.

- Nixalite™ was added on the fence at South Delta beach as a deterrent to predators, and improved chick shelters were developed and installed (BO FWS 1-6-03-F-3452.1 2003; 3452.2 2004; 3452.3 2005). In 2005, the fence was reconfigured for added site security for the terns.

***Continuing Mitigation***

Under the No Action Alternative, the Navy restricts training in three oceanside training lanes (Blue 2, Orange 1, and Orange 2) during the breeding season. As modeled (Section 3.12.3.1) and discussed in Section 3.12.3.12.3, this restriction may avoid lethal loss of approximately 25 nests annually.

Beach scheduling procedures bias activities with heavier beach use towards beach lanes with fewer nests, when it does not impact the realism of training or training needs. This management practice has not been required by or historically proposed to the USFWS to minimize losses, but is rather undertaken by the Navy voluntarily in its efforts to further minimize impacts. It minimizes potential effects on nesting birds by allocating the distribution of heavy impact training activities to a few training lanes, thereby allowing beach areas with heavier nesting densities to remain untouched or with reduced disturbance.

Nests may be moved small distances, as necessary and appropriate, to minimize potential impacts from training in high traffic areas, such as beach crossing lanes.

The Navy has a number of predator management and control measures that it implements throughout the breeding season to minimize impacts from predators, including avian predators, ants, and mammals (see Section 3.12.1.5.3 for more detail). In 2009, 512 individual predators were managed (either lethally removed or freed away from the nesting sites). During that same year, there were 32 documented predation incidents on California least terns and western snowy plovers other than by gulled-billed terns. Predator control has beneficial impacts beyond protecting individual eggs or chicks from loss to predation. The presence of predators can cause disturbance, flushing or even nest abandonment, potentially leading to overall habitat degradation or loss. As discussed in Section 3.12.1.3.1, because California least terns are colony breeders, they are particularly susceptible to predation and disturbance.

Predator control is considered by many species experts to be one of the most crucial management strategies for reproductive success (Foster 2006; USFWS 2006c). On Camp Pendleton, a rough tripling of nesting California least tern adult pairs from 1995 to 2001 was considered to be associated with the active removal of predators (Shwiff et al. 2004). Without the Navy's predator control program, the SSTC nesting sites would likely have substantial reproductive failure. This predator control program has allowed for and is expected to continue to promote over one thousand nests that are annually found on SSTC-N.

Sand hummocks are constructed in Green Beach lanes prior to the breeding season to discourage nesting in those lanes. Green Beach is typically used by heavy equipment for training. The sand hummocks encourage birds to nest in safer alternate locations. Red beaches are similar to Green beaches in that they are also used for heavy equipment beach party training, albeit to a lesser degree, and operate under similar avoidance and minimization strategies. After sand hummocks were employed, nesting levels in the Green beach lanes were historically about one fourth that of the nesting in adjacent Red Beach Lanes (approximately 120 annual nests per year in Red beach lanes, and approximately 30 nests per year in Green beach lanes). California least terns generally have high site fidelity, and it can be reasonably assumed that the remaining three quarters of the nests were located somewhere else on SSTC, which had an overall average annual loss of 2.6% between 2005-2009 (a historical average of 37 nests lost divided by 1378 total average nests on both SSTC oceanside and bayside beaches). By comparison, the modeled estimated average loss in Green beach lanes was approximately 11%. As such, loss of an estimated 7 nests may be avoided by this measure ((120-30 nests) * (11% - 3%) = 7 nests).

The Navy conducts routine site preparation to ensure the continued success of the Delta beaches. This includes grading or mowing, invasive weed control, beach cleanup, and enhancement with additional sand where appropriate and available. California least terns prefer vegetation cover of 10 – 20% for optimal nesting conditions (Carreker 1985). Without this site preparation and maintenance, the sites have in the past, and would likely quickly fill with weedy vegetation and become unsuitable to support the high density of nesting that they currently support.

The Navy places signs around SSTC and works to educate the public on the importance of avoiding nesting areas. Recreational usage degrades the value of the nesting habitat for California least terns on the beaches, as can be shown by the virtual lack of presence of California least terns nesting on state beaches that allow recreational usage. The Navy's signage, education, and overall restriction of the area for public use has allowed SSTC to remain high-density nesting habitat despite public interest in this area for recreational usage. Without these recreational use controls, the training beaches could degrade to low-quality or unusable nesting areas, similar to other recreational beach areas.

The Navy collects injured and sick individuals that it finds and takes them to a wildlife rehabilitation center. Abandoned least tern eggs that have been collected are provided to a wildlife center for hatching and rearing. From 2005 through 2009, the Navy collected and brought an average of 6.4 California least tern eggs/chicks/adults annually from NBC beaches to Project Wildlife for rehabilitation. A large percentage of these individuals were collected from abandoned nests, and the chicks/adults showed signs of illness. It is unknown how many of these eggs/chicks/adults survived.

As part of its overall management program, the Navy conducts intensive monitoring of least tern nesting sites to evaluate the impacts of training on least tern nesting, impacts of predation, and the general conditions of the nesting sites. Routine monitoring allows the Navy to quickly identify issues that may be present on the site and adapt the natural resource conservation program to address these issues.

The Navy plans to continue its current natural resource management program and adapt it as appropriate to provide maximum protection to the species while still meeting training needs and realism. The program has, and is expected to continue to fully mitigate for impacts that training may have on California least tern nesting on the SSTC training beaches.

#### 3.12.3.1.2 Alternative 1 (Preferred Alternative)

Modeling for Alternative 1 (described in detail in Section 3.12.3.1) allowed training to be conditionally scheduled in Blue 2, Orange 1, and Orange 2, if training was conducted in Red 1 through Blue 1, and these lanes were unavailable for additional training use or the training lanes had attributes that made them better for training than other available lanes. It also preferentially scheduled training activities with the largest footprint in training lanes with the fewest nests.

The model results determined that Lanes 8, 9, and 10 (Blue 2 through Orange 2) would need to be utilized for limited training during the nesting season, and estimated that on an average year, 24 training events would occur above the high tide line. The training that would occur in these lanes would have a temporary footprint of less than one-third of the lane on the western edge of where terns nest. Twenty two of the 24 activities are anticipated to need use of the beach for logistical/safety vehicles or personnel maneuvers, which typically requires limited use of the soft pack sand along the western edge of where the least terns and snowy plovers nest. Two of the 24 activities are anticipated to require a beach party team, which typically requires slightly larger use of the soft pack sand along the western edge of where least terns nest.

An average yearly mortality of 45 California least tern nests was estimated for the SSTC-N oceanside training lanes under Alternative 1, or 3.1% of the nests on the training lanes (see Section 3.12.3.1 for modeling methodology). A high mortality of 105 California least tern nests was estimated for the SSTC-N oceanside training lanes, or 7% of the nests on the training lanes (see Section 3.12.3.1 for modeling methodology). Thus, in a typical/average year, Alternative 1 would take seven more nests than the No Action Alternative. In a worst case year, Alternative 1 would take 17 more nests than the No Action Alternative. All birds present would be subject to potential disturbance. This includes harassment in lanes Blue 2 through Orange 2 since they will receive some use.

The model estimated that of the average 45 nests annually taken, 41 nests would be taken in Lanes 1-7 (Yellow 1 through Blue 1) and 4 nests would be incidentally lost in Lanes 8, 9, and 10 (Blue 2, Orange 1 and 2). Losses in Lanes 8, 9, and 10 on an average year may be associated with beach party team activities, logistical vehicles, running, and MCM activities. The relatively low loss of nests in Lanes 8, 9, and 10 is due to a number of reasons, including:

- As discussed in Section 3.12.1.5.3, training activities with higher impact on the beach would be preferentially scheduled away from areas with the highest density of nests when it doesn't impact training realism or training needs. This means that heavy impact training would be preferentially scheduled in the Yellow and Green beach lanes where nest numbers are low. Water-borne activities that have no beach requirements/impacts would be preferentially scheduled in Lanes 8, 9, and 10. Even if a beach activity were to be scheduled in Lanes 8, 9, and/or 10, it would be expected to be an activity with a small footprint and low impact on nesting birds.

- Few training activities are expected to use Lanes 8, 9, and 10. Lanes 8, 9, and 10 have different qualities than Lanes 1 through 7, including: distance away from Naval Amphibious Base Coronado, distance to the Silver Strand State Beach, distance from the Silver Strand Highway entrance, slope and condition of the nearshore underwater terrain, etc. Because of these qualities, most training activities naturally gravitate away from these lanes. Of the few remaining training activities that prefer to or need to use Lanes 8, 9, and 10, their training footprints on the beach are generally small when compared with the size of the beach, and they naturally tend towards the same beach areas close to the high tide line rather than further back in the nesting area. California least terns (and western snowy plovers) do not typically nest next to the high tide line or when they do, they nest in low densities. This leaves the back nesting area with a higher nesting density minimally impacted by training.

- Nests are very small when compared with the overall size of the training lane. The probability of a small footprint, short duration, training activity impacting a small, temporary nest within a large training lane is low. Historical monitoring data between 2005 and 2009 shows that an average of 2.6% of California least tern nests on the SSTC-N oceanside training lanes were lost, and 97.4% of the nests were not lost, despite unrestricted training and unbuffered nesting on SSTC-N Training Lanes 1 through 7.

The take estimates assume continuation of the present configuration of tern nesting on the Navy training beaches as well as an immediate 30 percent increase in training, which will in fact increase gradually, or be phased in, over time. In reality, least tern nesting is likely to shift away from more heavily used training areas towards less utilized training areas, as they have historically. This would make actual nest loss less than the estimated nest loss. Even if this were not the case, average loss of 45 nests and worst case loss of 105 nests are both below the incidental take allowance in 2009 (330 nests). SSTC has historically had losses greater than 45 nests (2002, 2003, and 2009) and nesting has not only persisted, but continually increased, after these losses. Much of this has to do with the Navy's mitigation measures and management practices discussed herein. The losses also would not decrease existing rangewide nesting (8,173 nests in 2006) below the 5,722 nests discussed above that would sustain a safe rangewide population, based on population viability analysis discussed in Section 3.12.1.3.1 (Akçakaya et al. 2003; USFWS 2005).

***Historical and Continuing Mitigation***

Historical mitigation for Alternative 1 is the same as discussed for the No Action Alternative (Section 3.12.2.2.1), and includes: addition of 45 acres of nesting habitat on Deltas North and South as mitigation for training on SSTC Oceanside beaches, fencing at NASNI and Delta South, maintenance of kelp at Camp Surf, replacement of power poles with underground wiring to remove predator perches, and the addition of Nixilite and reconfiguring of the fencing. These historical efforts, by themselves, can compensate for the training-related impacts to least terns of Alternative 1.

Current mitigation for the Alternative 1 is the same as discussed for the No Action Alternative (Section 3.12.2.1.1), and includes: beach scheduling procedures that bias training activities with heavy footprints away from beach areas with high nesting densities when it doesn't impact training needs or the realism of training, nest relocation as appropriate to minimize potential impact from training, predator management and control at the nesting sites, nesting deterrence in high use areas, site preparation and substrate enhancement to optimize habitat suitability, signage/education/recreational use restrictions to minimize public impacts on nesting birds, rearing of collected eggs and individuals, and routine monitoring of the sites. These current efforts, by themselves, can fully compensate for the training-related impacts to least terns of Alternative 1.

The beneficial impacts of both historical and current mitigation are described in Section 3.12.3.1.1 and 3.12.3.1.2, and where possible, quantified. This mitigation is expected to fully mitigate for anticipated impacts to California Least Terns from the proposed increase in military training and access to training beaches in Alternative 1, without additional mitigation.

***New Proposed Mitigation***

As discussed above, historical and current mitigation measures are expected to well compensate for anticipated impacts to California least terns from proposed military training in Alternative 1, without any additional mitigation. However, the Navy is proposing additional mitigation to further promote the success of the species:

The Navy is proposing to develop and implement a long-term site enhancement plan for SSTC, including both the oceanside and the bayside beaches. This site enhancement plan will work to control and where possible remove invasive non-native vegetation on the beaches, and if appropriate, replace it with native vegetation. SSTC-N oceanside training lanes currently contain over 16 acres of overgrown invasive vegetation (Table 3.12-13), mostly towards the back one third of the beach. While this additional depth of beach is needed for several reasons, including to provide separation from the highway, most training has minimal footprint in this area. Training is most heavily concentrated in areas closest to the tide line. Removal or replacement of invasive overgrown vegetation in the back beach area will open these safer areas up to nesting activity. Considering the current nesting densities each beach lane (Table 3.12-7), the benefits of the site enhancement plan can be estimated. While Table 3.12-7 shows a potential increase in nesting of 744 nests at current densities, the long-term site enhancement plan is estimated to more realistically mitigate for an estimated 360 nests annually. Vegetation may not be removed on Green beaches and Blue 1 beach due to the more intensive training activities that occur there. Some vegetation on Red beaches may need to be preserved to prevent sand blowing onto the State Highway 75 (fifty percent is conservatively estimated).

**Table 3.12-13: Vegetation and Tern Densities in Nesting Beaches**

| Training Lane | % of Non-Native Vegetative Cover | Density of Nests in Non-Vegetated Areas (nests/acre) | Potential Increase in Nesting |
|---|---|---|---|
| Yellow 1 | 0 | 0 | 0 |
| Yellow 2 | 0 | 2 | 0 |
| Red 1 | 15 | 13 | 195 |
| Red 2 | 36 | 7 | 252 |
| Green 1 | 22 | 5 | 110 |
| Green 2 | 22 | 2 | 44 |
| Blue 1 | 3 | 2 | 6 |
| Blue 2 | 3 | 12 | 36 |
| Orange 1 | 5 | 10 | 50 |
| Orange 2 | 3 | 17 | 51 |
| Total | | | **744** |

The Navy also plans to restrict vehicle patrolling and LARC V operator training from Red, Blue, and Orange beaches. This restriction minimizes impacts of these high footprint activities on the SSTC-N oceanside training beaches with the highest density of nests. Modeling estimates that in an average year, this restriction may avoid the impact of 2 nests.

The Navy plans to continue its current natural resource management program, add the above two mitigation approaches, and adapt the overall program as appropriate in the future to provide maximum protection to the species while still meeting training needs and realism. The program has, and is expected to continue to fully mitigate for training-related impacts on California least tern nesting on the SSTC training beaches under Alternative 1.

As discussed earlier, the Navy has submitted a biological assessment for the Proposed Action, specifically its preferred alternative, and has consulted with the USFWS under Section 7 of ESA and received a biological opinion on Alternative 1. Analysis from the USFWS biological opinion has been integrated into this EIS as appropriate.

#### 3.12.3.1.3 Alternative 2

Modeling for Alternative 2 (described in detail in Section 3.12.3.1) allowed training activities to be scheduled in Blue 2, Orange 1, and Orange 2 without condition. Trainers' natural inclination towards particular beach lanes was considered in the modeling.

An average yearly mortality of 67 California least tern nests was estimated for the SSTC-N oceanside training lanes under Alternative 2 due to military training in the ROI, or 5% of the nests in the training lanes (see Section 3.12.3.1 for modeling methodology). Modeling conservatively estimated that 156 nests would be lost annually in a highly intense training scenario, or 11% of the nests in the training lanes (see Section 3.12.3.1 for modeling methodology). Thus, in a typical/average year, Alternative 2 would take 29 more nests than the No Action Alternative. In a worst case year, Alternative 2 would take 68 more nests than the No Action Alternative. All birds present would potentially be disturbed from training activities.

The model predicted that, of the estimated 67 average annual nests lost, 41 of the nests would be lost in lanes 1-7, and 25 nests would be lost in lanes 8-10, which would be opened for year-round training under Alternative 2. This loss would not decrease the nesting total below the 5,722 nests that would maintain a stable rangewide population in accordance with the population viability analysis discussed in Section 3.12.1.3.1 (Akçakaya et al. 2003; USFWS 2005).

The take estimates assume continuation of the present configuration of tern nesting on the Navy training beaches as well as an immediate 30 percent increase in training, which will in fact increase gradually, or be phased in, over time. In reality, least tern nesting is likely to shift away from more heavily used training areas towards less utilized training areas, as they have historically. This would make actual nest lost less than estimated nest loss. Even if this were not the case, average annual average loss of 67 nests and worst case loss of 156 nests are both below the USFWS incidental take allowance in 2007 (455 nests). The anticipated losses exceed historical losses seen on SSTC; however, current and proposed mitigation are expected to fully mitigate for these impacts.

***Mitigation***

Historical mitigation for Alternative 2 is the same as discussed for the No Action Alternative (Section 3.12.3.1.1), and includes: addition of 45 acres of nesting habitat on Deltas North and South as mitigation for training on SSTC Oceanside beaches, fencing at NASNI and Delta South, maintenance of kelp at Camp Surf, replacement of power poles with underground wiring to remove predator perches, and the addition of Nixilite and reconfiguring of the fencing. These historical efforts, by themselves, can compensate for the training-related impacts to least terns of Alternative 2.

Continuing mitigation for the Alternative 2 is the same as discussed for the No Action Alternative (Section 3.12.3.1.1), except beach scheduling procedures that bias training activities with heavy footprints would not be used. Continuing mitigation for Alternative 2 includes: nest relocation as appropriate to minimize potential impact from training, predator management and control at the nesting sites, nesting deterrence in high use areas, site preparation and substrate enhancement to optimize habitat suitability, signage/education/recreational use restrictions to minimize public impacts on nesting birds, rearing of collected eggs and individuals, and routine monitoring of the sites. These current efforts, by themselves, can compensate for the training-related impacts to least terns of Alternative 2.

Additional proposed mitigation for Alternative 2 includes a site enhancement plan for SSTC, as is discussed for Alternative 1 (Section 3.12.3.1.2).

The beneficial impacts of both historical and current mitigation are described in Section 3.12.3.1.1. The beneficial impacts of proposed training is discussed in Section 3.12.3.1.2. Beneficial impacts are quantified where possible. Historical and continuing mitigation is expected to fully mitigate for anticipated impacts to California Least Terns from the proposed increase in military training and access to training beaches, without the additional mitigation that the Navy is proposing.

### 3.12.3.2 Western Snowy Plover

#### 3.12.3.2.1 No Action Alternative

Under the No Action Alternative all western snowy plover nests would be buffered, and those in Lanes Blue 2 through Orange 2 would be avoided because of nesting season lane access restrictions. Since all plover nests would be avoided, it is anticipated that this would lead to incidental loss similar to what is currently experienced from Navy training activities. This level of loss as well as the annual take exemption authorized by the USFWS is given in Table 3.12-14. Causes for the losses are not known in all cases, and some may not be associated with military training activities. One fledgling known to be lost in 2004 was due to environmental monitoring, and five plover eggs were vandalized in 2005 by unknown individuals. In reality, there are other potential, and likely, causes unrelated to military training.

**Table 3.12-14: Western Snowy Plover Historical Incidental Take Allowance and Level of Take in the ROI**

| Year | Take Allowance | Actual Take (eggs and chicks) |
|---|---|---|
| 1999 | 3 eggs/chicks | 0 |
| 2000 | 1 nest or 3 eggs | 2 |
| 2001 | 3 eggs/chicks | 0 |
| 2002 | 3 eggs to training, 2 chicks to beach raking | 3 |
| 2003 | 5 nests or 15 eggs/chicks | 3* |
| 2004 | 5 nests or 15 eggs/chicks | 1 |
| 2005 | 7 nests or 21 eggs/chicks | 0 |
| 2006 | 7 nests or 21 eggs/chicks | 0 |
| 2007 | 3 nests or 9 eggs/chicks | 0 |
| 2008 | 2 nests or 6 eggs/chicks | 0 |
| 2009 | 2 nests or 6 eggs/chicks (extension of ’08 take allowance) | 0 |

*These eggs were collected from training areas.

Nesting activity has increased despite the average historical annual losses, indicating a capability of the species to not only continue to persist on SSTC, but also to increase, with training occurring in the nesting beaches during the nesting season. Much of this has to do with the Navy’s mitigation measures and management practices discussed below.

***Current Mitigation Measures***

Under the No Action Alternative, plover nests are buffered with blue flexistakes and training is prohibited from an approximate 30 meter diameter area, except in the training lanes set aside during the nesting season. The Navy also restricts training in three oceanside training lanes (Blue 2, Orange 1, and Orange 2) during the breeding season. As will be discussed in Section 3.12.3.2.2, this management practice is estimated to avoid the direct lethal loss of approximately 3.1% of nesting plovers on the beach, or one plover nest out of every 32 nests on the beach.

Scheduling procedures bias activities with heavier beach use towards beach lanes with fewer nests, when it does not impact the realism of training or training needs. This management practice has not been required by or historically proposed to the USFWS to minimize losses, but is rather undertaken by the Navy voluntarily in its efforts to further minimize impacts. It minimizes the distribution of heavy impact training activities to a select few training lanes, thereby allowing beach areas with heavier nesting densities to remain untouched or with reduced disturbance.

Nests may be moved small distances, as necessary and appropriate, to reduce conflicts with training.

Sand hummocks are constructed in Green Beach lanes prior to the breeding season to discourage nesting there. Green Beach is typically used by heavy equipment for training. The sand hummocks encourage birds to nest in alternative areas with fewer disturbances.

The Navy has a number of predator management and control measures that it implements throughout the breeding season to minimize impacts from predators, including avian predators, ants, and mammals (see Section 3.12.1.5.3 for more detail). In 2009, 512 individual predators were managed (either lethally removed or freed away from the nesting sites). During that same year, there were 32 documented predation incidents on California least terns and western snowy plovers other than by gulled-billed terns. Predator control has beneficial impacts beyond protecting individual eggs or chicks from being lost to predation. The presence of predators can cause disturbance, flushing or even nest abandonment, potentially leading to overall habitat degradation or loss. As discussed in Section 3.12.1.3.1, because the isolated nature of the sites, western snowy plovers on SSTC are particularly susceptible to predation and disturbance. Predator control is considered by many species experts to be one of the most crucial management strategies for reproductive success (Foster 2006; USFWS 2006c). On Camp Pendleton, a rough tripling of nesting California least tern adult pairs from 1995 to 2001 was considered to be associated with the active removal of predators (Shwiff et al. 2004). Without the Navy's predator control program, the SSTC nesting sites would likely have substantial reproductive failure. This predator control program has allowed for and is expected to continue to promote over 42 western snowy plover nests that are annually found on average at SSTC.

Depending on site conditions, some plover nests are covered with mini-enclosures (MEs) to protect them from mammalian and avian predators. The benefits of MEs at SSTC have not been quantified. They have been quantified for piping plovers in the Great Plains in beaches that extend along a narrow perimeter of a wetland and are relatively narrow between the water and upland vegetation. Nest cages were found to improve the fledging rates of Great Plains piping plovers 44% above baseline levels (Larson et. al 2002).

Kelp and other marine vegetation at YMCA Camp Surf were removed in certain sections of the beach to ensure safe operation of the facility beginning in 2003. Kelp management commenced because Camp Surf administrators were worried about the safety of the children; however, the kelp material was not buried and was stored where the western snowy plover had access to the invertebrates for foraging. This action continues annually.

The Navy collects injured and sick individuals that it finds and takes them to a wildlife rehabilitation center. Abandoned least tern eggs that have been collected are provided to a wildlife center for hatching and rearing. From 2005 through 2009, the Navy collected and brought an annual average of 22.8 western snowy plover eggs/chicks/adults from SSTC beaches to Project Wildlife for rehabilitation. A large percentage of these individuals were collected from abandoned nests, and the chicks/adults showed signs of illness. Approximately 35% of collected western snowy plover eggs/chicks survived and been released back into the wild.

As part of its overall management program, the Navy conducts monitoring of western snowy plover nesting sites to evaluate the impacts of training on the least tern nesting, impacts of predation, and the general conditions of the nesting sites. Routine monitoring allows the Navy to quickly identify issues that may be present on the site and adapt the natural resource conservation program to address these issues.

### 3.12.3.2.2 Alternative 1 (Preferred Alternative)

Under Alternative 1, the Navy would buffer a maximum of 22 western snowy plover nests at one time on SSTC-N and SSTC–S oceanside beaches, plus any additional nests that are initiated in beach lanes Orange 1 and Orange 2. For the buffered nests, the Navy anticipates that a historical average annual take of near zero nests due to military training would continue. Table 3.12-15 shows the historical loss levels. As discussed in Section 3.12.3.2.1, causes for the losses are not known in all cases, and some may not be associated with military training activities. One fledgling known to be lost in 2004 was due to environmental monitoring, and five plover eggs were vandalized in 2005 by unknown individuals. In reality, there are other potential, and likely, causes unrelated to military training.

Each nest that appears above 22 nests at one time would not be buffered (excepting those initiated in Orange 1 and Orange 2). Although the unbuffered nests are potentially subject to loss, the fact that the nests are not buffered does not necessarily mean they would be lost. Successful nesting could still occur, and would likely occur, at these sites. To estimate the potential impacts to unbuffered western snowy plover nests, the Navy considered the historical and estimated future impacts of military training on California least tern nests. California least tern nests are not buffered, and would be expected to experience similar loss as unbuffered western snowy plover nests. Nest distribution throughout the training area was compared for the two species and were found to be similar (Table 3.12-15).

**Table 3.12-15 Comparison of California Least Tern and Western Snowy Plover Historical Nest Distribution in SSTC-N Oceanside Training Lanes**

| Training Lane | California Least Tern | | Western Snowy Plover | |
|---|---|---|---|---|
| | Average # of nests from years 2005 - 2009 | % of nests in each training lane | Average # of nests from years 2005 - 2009 | % of nests in each training lane |
| Yellow 1 | 0 | 0% | 0 | 0% |
| Yellow 2 | 42.4 | 5% | 2.4 | 5% |
| Red 1 | 179.4 | 20% | 7 | 16% |
| Red 2 | 71.2 | 8% | 3 | 7% |
| Green 1 | 52.4 | 6% | 0.4 | 1% |
| Green 2 | 25 | 3% | 0.2 | 0% |
| Blue 1 | 27.8 | 3% | 3.4 | 8% |
| Blue 2 | 178.2 | 20% | 9 | 20% |
| Orange 1 | 138.6 | 15% | 8.2 | 19% |
| Orange 2 | 194.4 | 21% | 10.4 | 24% |
| **Total** | **909.4** | | **44** | |

Historically, most unbuffered California Least Tern nests have not been lost. Historical data between 2005 and 2009 shows that an average of 2.6% of California least tern nests on the SSTC-N oceanside training lanes were lost, and 97.4% of the nests were not lost. Impacts to unbufffered western snowy plover nests are expected to be similar due to their similar distribution throughout the training range.

Modeling (described in Section 3.12.3.1 and further discussed in Section 3.12.3.1.2) estimated that under Alternative 1 in an average year, 3.1% of the unbuffered least tern nests would be lost, which would translate to one lost Snowy Plover nest out of every 32 unbuffered nests. In a worst case year, 7% of unbuffered snowy plover nests would be lost, or one lost snowy plover nest out of every 14 unbuffered nests. Considering that snowy plovers nest on both SSTC-N and SSTC-S, and least terns nest only on SSTC-N, and that military training is more intensive on SSTC-N than SSTC-S, the percentage of overall unbuffered snowy plover nests lost is likely to be less than the percentage of overall unbuffered least tern nests lost.

When nests occur at the same time on the beach, each nest typically represents one pair of nesting birds. Maximum number of nests at one time is typically reflective of the number of pairs at a site. Under current conditions, the SSTC oceanside beaches typically have had 22 or fewer maximum concurrent nests at one time, or fewer than 22 nesting pairs of western snowy plovers (Table 3.12-15), all of which would be buffered under Alternative 1. If the population of western snowy plovers increases past 22 western snowy plover nesting pairs in the SSTC oceanside training lanes in the future, on average, less than 3.1% of the unbuffered additional nests at SSTC would be expected to be lost (greater than 96.9% of the unbuffered additional nests would not be lost) under Alternative 1. For example, if 54 pairs of western snowy plovers were to nest on SSTC oceanside beaches (22 buffered pairs plus 32 unbuffered pairs), it is anticipated that one of the unbuffered pairs' nests would be lost in an average year due to military training. On the central California coast, western snowy plovers may double brood, and females sometimes triple brood during a nesting season. If 86 pairs of western snowy plovers were to nest on SSTC oceanside beaches (22 buffered pairs plus 64 unbuffered pairs), it is anticipated that two of the unbuffered pairs' nests would be lost in an average year due to military training. Currently, fewer than 22 nests occur on SSTC beaches, and none of the 22 nests would be expected to be lost in an average year.

In addition to western snowy plovers on SSTC oceanside beaches, buffered/fenced nesting on NASNI beaches and SSTC Delta Beach North and South will continue. In 2002 and 2003, there were 12 (2002) and 13 (2003) maximum active nests on NASNI as well as 3 (2002) and 1 (2003) on Delta Beach North and South combined. Combining all the nesting on Naval Base Coronado property, it is estimated that if 68 pairs of western snowy plovers were to nest on Naval Base Coronado (54 pairs on SSTC oceanside beaches, 12 or more on NASNI, and 2 or more on the SSTC Delta Beaches), up to one pairs' nests may be lost in an average year due to military training.

The Final USFWS Recovery Plan management goal for western snowy plover on all Silver Strand beaches including non-Navy managed beaches (NASNI, SSTC-N, SSTC-S, Silver Strand State Beach, and the Coronado Beaches) is 95 breeding adults. The current preferred method for determining breeding pairs is maximum nests at one time. If one assumes that 95 breeding adults correlate to 48 pairs necessary for the Silver Strand beaches, this roughly correlates to 48 required active nests at one time to meet recovery goals. Given that the nesting of only one pair of the first 68 pairs is expected to be taken by training (67 viable nesting pairs), it may be possible for the Navy to meet the USFWS management goal for this area on its property alone.

***Current Mitigation***

Current mitigation for the Alternative 1 is the same as discussed for the No Action Alternative (Section 3.12.3.2.1), and includes: beach scheduling procedures that bias training activities with heavy footprints away from beach areas with high nesting densities when it doesn't impact training needs or the realism of training, nest relocation as appropriate to minimize potential impact from training, predator management and control at the nesting sites, nesting deterrence in high use areas, maintenance of kelp on the beaches, use of MEs, site preparation and substrate enhancement to optimize habitat suitability, signage/education/recreational use restrictions to minimize public impacts on nesting birds, rearing of collected eggs and individuals, and routine monitoring of the sites.

Some of the current mitigation measures play a larger role in protecting western snowy plover under Alternative 1, due to the proposed cap on buffers placed around western snowy plover nests and increased access to SSTC-N oceanside Beach Lanes 8, 9, and 10.

Sand hummocks constructed in Green Beach lanes prior to the breeding season to discourage nesting will not only reduce the potential for disturbance in a higher use area, but also encourage birds to nest in safer alternate locations. This is particularly beneficial for western snowy plovers that may not receive an avoidance buffer around their nests. After sand hummocks were employed, plovers didn’t typically nest in Green beach lanes, whereas Red Beach historically averaged approximately 10 nests. Western snowy plovers generally have high site fidelity, and it can be reasonably assumed that the nests that would have been constructed on Green Beaches were located somewhere else on SSTC. As discussed in Section 3.12.3.1.1, unbuffered California least tern nests had an overall average annual loss of 2.6% between 2005-2009, versus the modeled estimated average loss in Green Beach lanes of approximately 11% (9.4% difference). Due to their similarity in distribution, unbuffered western snowy plover nests could be expected to show similar benefits from sand hummocks in Green Beach as California least tern nests. An estimated 9.4% of the 3.1% potential loss to unbuffered western snowy plover nests that would have occurred in Green Beach could potentially be avoided by this measure.

Beach scheduling procedures bias activities with heavier beach use towards beach lanes with fewer nests, when it does not impact the realism of training or training needs. As discussed above, this management practice has not been required by or historically proposed to the USFWS to minimize losses, but is rather undertaken by the Navy voluntarily in its efforts to further minimize impacts. It minimizes the distribution of heavy impact training activities to a few training lanes, thereby allowing beach areas with heavier nesting densities to remain untouched or with reduced disturbance. This is particularly beneficial for western snowy plover nests that may be unbuffered.

***New Proposed Mitigation***

The Navy is proposing additional mitigation to further promote the success of the species:

The Navy is proposing to develop and implement a long-term site enhancement plan for SSTC, including both the oceanside and the bayside beaches. This site enhancement plan will work to control and where possible remove invasive non-native vegetation on the beaches and, if appropriate, replace it with native vegetation. SSTC-N Oceanside training lanes currently contain over 16 acres of overgrown invasive vegetation (Table 3.12-16), mostly towards the back one third of the beach. While this additional depth of beach is needed for several reasons, including to provide separation from the highway, most training has minimal footprint on this area. Training is most heavily concentrated in areas closest to the tide line. Removal or replacement of invasive overgrown vegetation in the back beach area will open these safer areas up to nesting activity. Considering the current nesting densities each beach lane (Table 3.12-15), the benefits of the site enhancement plan can be estimated. While Table 3.12-16 shows a potential increase in nesting of 43 nests at current densities, the long-term site enhancement plan is estimated to more realistically mitigate for an estimated 34 nests annually. Vegetation may not be removed on Green beaches and Blue 1 beach due to the more intensive training activities that occur there. Some vegetation on Red beaches may need to be preserved to prevent sand blowing onto the State Highway 75 (fifty percent is conservatively estimated).

**Table 3.12-16: Vegetation and Plover Densities in Nesting Beaches**

| Training Lane | % of Non-Native Vegetative Cover | Density of Nests in Non-Vegetated Areas (nests/acre) | Potential Increase in Nesting |
|---|---|---|---|
| Yellow 1 | 0 | 0 | 0 |
| Yellow 2 | 0 | 0 | 0 |
| Red 1 | 15 | 0.5 | 8 |
| Red 2 | 36 | 0.1 | 4 |
| Green 1 | 22 | 0 | 0 |
| Green 2 | 22 | 0 | 0 |
| Blue 1 | 3 | 1.1 | 3 |
| Blue 2 | 3 | 3.0 | 9 |
| Orange 1 | 5 | 1.6 | 8 |
| Orange 2 | 3 | 3.5 | 11 |
| Total | | | **43** |

The Navy also plans to restrict vehicle patrolling and LARC V operator training from Red, Blue, and Orange Beaches. This restriction minimizes impacts of these high footprint activities on the SSTC-N oceanside training beaches with the highest density of nests. Modeling estimates that in an average year, this restriction may avoid the impact of up to 1 nest.

The Navy plans to continue its current natural resource management program, add the above two mitigation approaches, and adapt the overall program as appropriate in the future to provide maximum protection to the species while still meeting training needs and realism. The program has, and is expected to continue to well compensate for impacts that training may have on western snowy plover nesting on the SSTC training beaches even under Alternative 1. It is expected that effects due to predation, specifically the gull-billed tern, and from yet unknown causes will continue to have a larger effect on the success of the species than Navy training.

### 3.12.3.2.3 Alternative 2

Under Alternative 2, modeling (described in Section 3.12.3.1) estimated that in an average year, 5% of the unbuffered nests would be lost, or one in every 22 unbuffered nests. In a worst case year, 11% of unbuffered nests would be lost, or one in 9 unbuffered nests. The modeling is conservative in that it does not included buffering of any nests initiated in Orange 1 or Orange 2.

As discussed in Section 3.12.3.2.2, maximum number of nests at one time is typically reflective of the number of pairs at a site and the SSTC oceanside beaches typically have had 22 or less maximum concurrent nests at one time, or less than 22 nesting pairs of western snowy plovers (Table 3.12-15), all of which would be buffered under Alternative 1. If the population of western snowy plovers increases past 22 western snowy plover nesting pairs in the SSTC-N and SSTC-S oceanside training lanes in the future, on average, an estimated 5% of the unbuffered additional nests would be lost (95% of the unbuffered additional nests would not be lost) under Alternative 1. Said another way, for the first 44 pairs of western snowy plovers nesting on SSTC oceanside beaches (22 buffered pairs plus 22 unbuffered pairs), it is anticipated that one of the unbuffered pairs' nests would be lost in an average year.

In addition to western snowy plovers on SSTC oceanside beaches, buffered/fenced nesting on NASNI beaches and SSTC Delta Beach North and South will continue. In 2002 and 2003, there were 12 (2002) and 13 (2003) maximum active nests on NASNI as well as 3 (2002) and 1 (2003) on Delta Beach North and South combined. Combining all the nesting on Naval Base Coronado property, it is estimated that if up to 58 pairs of western snowy plovers nest on Naval Base Coronado (44 pairs on SSTC oceanside beaches, 12 or more on NASNI, and 2 or more on the SSTC Delta Beaches), up to one of a pairs' nests may be lost in an average year.

The final USFWS Recovery Plan management goal for western snowy plovers on the all Silver Strand beaches including non-Navy managed beaches (NASNI, SSTC-N, SSTC-S, Silver Strand State Beach, and the Coronado Beaches) is 95 breeding adults. The current preferred method for determining breeding pairs is maximum nests at one time. If one assumes that 95 breeding adults correlate to 48 pairs necessary for the Silver Strand beaches, this roughly correlates to 48 required active nests at one time to meet recovery goals. Given that the nesting of only one pair of 58 pairs is expected to be not viable (57 viable nesting pairs), it may be possible for the Navy to meet the USFWS management goal for this area on its property alone under Alternative 2.

***Mitigation***

Current and proposed mitigation for the Alternative 2 is the same as discussed for the No Action Alternative and Alternative 1 (Sections 3.12.3.2.1 and 3.12.3.2.2), except LARC V and vehicle patrolling would not be restricted and beach scheduling procedures that bias training activities to particular lanes would not be implemented. Mitigation for Alternative 2 includes: nest relocation as appropriate to minimize potential impact from training, predator management and control at the nesting sites, nesting deterrence in high use areas, maintenance of kelp on the beaches, use of MEs, site preparation and substrate enhancement to optimize habitat suitability, signage/education/recreational use restrictions to minimize public impacts on nesting birds, rearing of collected eggs and individuals, routine monitoring of the sites, and a long term site enhancement plan.

The Navy plans to continue its current natural resource management program, and add additional mitigation, and adapt the overall program as appropriate in the future to provide maximum protection to the species while still meeting training needs and realism. The program has, and is expected to continue to well compensate for impacts that training may have on western snowy plover nesting on the SSTC training beaches even under Alternative 2. It is expected that effects due to predation, specifically the gull-billed tern, and from yet unknown causes will continue to have a larger effect on the success of the species than Navy training.

### 3.12.3.3 California Brown Pelican

Based on the limited potential contact as well as the status of the pelican stated in the five-year review, it is anticipated that none of the alternatives would adversely affect the population of California brown pelican. There are no known significant pelican roost sites on Navy training beaches in the SSTC. Pelicans do roost on Homeport Island which is located in the in-water bayside training area Delta III as well as along the wave attenuator at Fiddler's Cove Marina, which is between Navy in-water bayside training areas Delta I and Charlie. The numbers of pelicans that use San Diego Bay and Silver Strand ocean beaches were counted over a year long 2006-07 Port-Navy bird survey effort. Brown pelicans counted in grid cells overlapping the ROI totaled 4,845 for the entire year, compared to 10,164 observed in the entire survey area. Birds in or adjacent to the ROI were most numerous along Zuniga Jetty, around Fiddler's Cove Marina, and around Homeport Island. Maximum counts at these sites include 175 along Zuniga Jetty in September, 75 at Fiddler's Cove Marina in November, and 104 at Homeport Island in September.

These roost areas are likely to receive disturbance from transiting Navy craft or trainees on Zuniga Jetty but as the craft and trainees will only be transiting the area the disturbance is expected to be transient and not different from background levels of activity in San Diego Bay.

Underwater detonations also have the potential to directly harm pelicans. The mitigation measures for underwater detonations would require that the detonation area be monitored for 30 minutes prior to and 30 minutes after a detonation and that successive detonations be more than 30 minutes or less than 10 seconds apart. When monitoring the area, personnel watch for marine mammals, sea turtles, and diving birds. Presence of these animals would cause the detonation to halt.

According to Yelverton et al. (1973), the safe impulse distance for birds, for all practical purposes, can be the same as that for diving mammals. That is, birds must be closer to the blast to sustain injury, so the marine mammal distance would be adequate. The suggested criteria should apply to birds of a wide range of sizes, with a lethal dose being approximately the same for larger birds as smaller (Yelverton et al. 1973).

Without a means to avoid blast impacts to diving birds, there would be mortality due to injuries from these detonations; the probability would increase due to fish kill that would attract foraging birds in sequential blasts. The protective measure of scheduling sequential underwater detonations more than 30 minutes or less than 10 seconds apart limits the potential for effect on birds that would come to forage on any potential fish kill. Transiting pelicans or those resting on the water may be startled and also experience concussive injury if diving, although they are not deep divers and therefore do not spend as much time under water as other birds such as cormorants. Because the underwater detonation protective measures include watching for rafting or circling birds (like pelicans preparing to dive) immediately before a detonation, potential effects are minimized to the extent possible.

In-water pile driving activities that have the potential to cloud the water and impede foraging are governed by a programmatic MOU between the USFWS and the Navy. The MOU primarily addresses the California least tern but also benefits the pelican through requiring silt curtains on dredging activities. In addition, noise created during construction or maintenance activities such as pile driving is managed during periods when these species are foraging due to the potentially significant effect of noise on fish forage (DoN and USFWS 2004). This MOU is currently under revision.

#### 3.12.3.4 Light-Footed Clapper Rail

While clapper rail habitat (salt marsh and adjacent mudflat) occurs in the ROI, no activities are planned in salt marsh where the rail nests and finds shelter, or in the mudflats where it forages. There are a few training activities that access the southwest corner of San Diego Bay in the vicinity where the clapper rail has been sighted. These activities cross the Silver Strand from the ocean to the San Diego Bay at Emory Cove, possibly beaching on the oceanside or carrying non-motorized boats, and subsequently, swimming or paddling towards the power plant or Naval Base San Diego. Trainees may also approach from the bayside, through Emory Cove, in small motorized boats. Trainees beach their boats, cross SR-75, and mock-attack a target in the SSTC-S inland area, returning to their boats when finished. These types of activities may occur in up to 28 distinct training events per year. The individuals do not maneuver on the bayside outside of the dredged out Emory Cove channel, and would not come into contact with salt marsh or adjacent mudflat where clapper rails may occur. No additional activities in the area are anticipated. Based on this lack of training contact with clapper rail habitat and the very low and sporadic population of clapper rails in the SSTC-S salt marsh, none of the alternatives would have an effect on the light-footed clapper rail.

### 3.12.4 Proposed Mitigation Measures

All listed species management measures currently employed under No Action alternative are in accordance with previous USFWS Biological Opinions (as described in detail in Section 3.12.1.5) and will continue, with the exception of lane management of SSTC-N training lanes Blue 2 through Orange 2 as previously described in 3.12.1.5.3. In addition, the following mitigation measures are proposed, which are consistent with the USFWS Biological Opinion on SSTC operations (FWS-SDG-08B0503-09F0517) signed July 7, 2010.

#### 3.12.4.1 California Least Tern and Western Snowy Plover Measures

Due to anticipated impacts to California least tern and western snowy plover from the action alternatives, measures will be implemented to minimize and manage these impacts:

- The Navy will consider the tide conditions when developing training schedules, and schedule training activities that could be conducted on the hardpack during low tides when consistent with training needs.

- The Navy will mark and buffer up to 22 concurrent snowy plover nests established at SSTC-N and SSTC-S beaches plus any additional nests that exceed 22 that are initiated in beach lanes Orange 1 and Orange 2.

- Under baseline conditions, the southern 3 beach lanes are marked to facilitate avoidance of tern and plover nests. The Navy is developing a marking strategy to delineate least tern and snowy plover nesting areas that does not encumber training activities. Such a marking strategy may entail signage affixed to existing beach lane sign posts and a limited number of additional markers.

- The Navy will delineate the boundary of SSTC-S that parallels the mean high tide line in a manner that does not encumber training exercises.

- If relocation of any least tern or snowy plover nest/egg is necessary as a protective measure, each nest/egg will be relocated the shortest distance possible into suitable habitat by Service-approved monitors to increase the chances for nest success. The weekly reports to be submitted to the CFWO under the proposed project will include: a) date the nests/eggs were moved, b) number of nests/eggs moved, c) original and ending location of nests/eggs moved, and (d) distance the nests/eggs were moved.

- Install temporary barriers and improved signage on the southern end of SSTC-N to more clearly notify the public of the Navy's exclusive use of SSTC-N beach and existing restrictions on public usage of those beaches.

- The NBC Natural Resources staff will brief all dog handlers annually, or more frequently if necessary, of guidelines pertaining to the use of military working dogs on SSTC beaches.

- Military working dog handlers will be notified weekly of the locations of plover nests and, to the maximum extent possible, remain a minimum of 30 m (90 ft) from markers that delineate the locations of nesting plovers. Outside of the nesting season (15 Sept through end of February), training may occur unencumbered.

- Physical conditioning will primarily occur on the hard pack sand on SSTC oceanside beaches. If physical conditioning on soft pack sand is necessary, handlers and military working dogs will run on the sand road (SSTC-N only) or within 20 feet of the hard pack sand (SSTC-S only) to reduce the disturbance and impact to nesting terns and plovers.

- At SSTC-N, military working dogs will exercise primarily between beach lanes Yellow 1 and Blue 1, where they may cross the beach to get to the sand road at the existing route immediately to the north of the demo pit. The Navy will not conduct physical conditioning using dogs in the southern three beach lanes until: a) completing a study to evaluate the effects of military working dogs on terns and plovers and b) coordinating with the USFWS to develop conservation measures to minimize any additional effects.

- If military working dog training is requested as part of Platoon Over-the-Beach activities at SSTC-N, these activities will be scheduled in beach lanes Yellow 1, the north half of Yellow 2, Green 1 or Green 2, pending the results of the Navy's study to evaluate the response of terns and plovers to military working dog presence.

- The Navy will coordinate with the Service in the development of the study to evaluate the effects of military working dogs on terns and plovers and will submit the study design and scope of work to the Service for review and approval. The Navy will allow the Service 30 days to submit comments and an additional 30 days to approve the final study design and scope of work.

- The Navy will coordinate with the Service in the development of the Long Term Habitat Enhancement Plan for SSTC and will submit the plan to the Service for review and approval. The Navy will allow the Service 30 days to submit comments and an additional 30 days to approve the final study design and scope of work.

- The Navy will include the following information in the yearly reports to be submitted to the USFWS under the proposed project: a) the number and distribution of terns and plovers observed in each training lane; b) the number of any dead or injured least terns or snowy plovers (including eggs, chicks or adults) observed in each training lane; c) the hatching rate of terns and plovers in each beach lane; d) maps of the locations of tern and plover roosts within the action area; e) the timing and number of training events within the southern 3 beach lanes, and other beach lanes, to the extent available; f) the date and condition of any dead or injured tern or plover; and g) any measures taken to prevent additional tern or plover death or injury.

- The Navy will ensure that biological monitors look for and document the location of least tern or snowy plover nests, eggs and chicks prior to and after all military training exercises, to allow assessment of take associated with training activities.

- The Navy will provide California Coastal Commission staff monitoring reports prepared for the U.S. Fish and Wildlife Service under the July 7, 2010 Biological Opinion.

- Consistent with other applicable laws and to the extent possible and practical, the Navy will maintain signs and enforce the existing ban on the public bringing nonmilitary working dogs to Navy-controlled beaches.

#### 3.12.4.2 Training Activity Restrictions

**Vehicle Patrolling and LARC V Operator Training.** Vehicle patrolling and LARC V Operator training will not occur in Red, Blue, or Orange Beach Lanes**.**

### 3.12.5 Unavoidable Adverse Environmental Effects

Unavoidable environmental impacts to federally listed bird species are discussed in Section 3.12.3 Federally Listed Species Impacts.

As mentioned in Section 3.12.1.1.1, military readiness activities are exempt from the take prohibitions of the Migratory Bird Treaty Act provided they do not result in a significant adverse effect on a population of a migratory bird species. A number of migratory bird species covered under the MBTA are listed as endangered or threatened, and are discussed in detail in Section 3.12.3. Other species that occur at SSTC are also covered under the MBTA, but are not federally or state-listed as endangered or threatened; these species are not limited to, but include the special status birds listed in Table 3.12-5.

Unavoidable environmental effects are described below:

- Effects on nesting least terns and snowy plovers will likely result from increased access to training areas during the breeding season of these birds. This may include some mortality and loss of productivity (see Section 3.12.3).

- General disturbance of migratory birds, will likely result from the increased interaction between humans on foot in small and large groups, vehicles, equipment, weapons firing, pyrotechnics, dogs, marine vessels, etc. The effects are both behavioral and physiological, and could result in short-term and temporary disruption of foraging, roosting, or nesting for both common and special status species. Noise can also interfere with animal communication. An unquantifiable effect of an increasingly noisy environment may affect avian use of the SSTC.

- General habitat degradation is likely due to the increased presence of humans, noise, vehicles, helicopters, and heavy equipment. On the other hand, these activities may also control vegetation on the site which helps to preserve habitat on the site. Habitat for foraging, roosting, or nesting may be temporarily unavailable due to occupation of the amphibious landing area and associated activities on the beach that could occupy a large footprint.

- Both action alternatives could expose diving birds to concussive injury from underwater detonation. However the procedure proposed for pre-detonation monitoring minimizes the risk of such injury (Section 3.9 Marine Mammals; Current Mitigation Measures).

With implementation of mitigation measures and management practices, no other unavoidable, adverse environmental effects have been identified for bird species at the population level as a result of implementation of any of the alternatives.

### 3.12.6 Summary of Effects

The Proposed Action (Alternative 1) would result in adverse effects on individual birds; none of these temporary effects are expected to have an adverse effect on nesting shorebirds and seabirds at the population level, such as to the California least tern and western snowy plover. Effects would be minimized due to the proposed mitigation measures; effects would also be minimized by de-conflicting access to training beaches due to the presence of nesting birds. Impacts to the California least tern and western snowy plover are described in detail in a separate Biological Assessment, prepared for consultation with the USFWS under Section 7 of the ESA. This BA was submitted to the USFWS by the Navy, initiating consultation on these species. The consultation process concluded with the signing of the Biological Opinion on July 7, 2010, which concluded that activities under the Proposed Action would not jeopardize the continued existence of ESA-listed species.

#### 3.12.6.1 No Action Alternative

The potential impacts to birds of the No Action Alternative would be limited, short-term, and direct/indirect to individuals rather than a population of migratory birds. No unavoidable adverse effects are expected on migratory bird populations as a result of implementing the common elements of the No Action Alternative. Activities are covered under existing Navy/USFWS Biological Opinions and permits.

While many activities are frequent, most have a small footprint in proportion to the area available and, by their nature, they are short in duration.

The potential for direct impact to birds on the water or on land is remote. The primary effect to birds is flushing of individual birds, such as passerines, which may use wetlands and scrub areas for nesting. The energy that a foraging, resting, or nesting bird must expend can affect its reproductive success, even if it is using the ROI for a short time as a stopover rest area during migration, and not to nest. Flushing could also occur from on-foot land-based activities, such as during the use of pyrotechnics. These effects are minor and short-term to birds because there are only small groups of personnel acting covertly; further, the personnel are dispersed throughout the 600 acres of inland area—concentrated near roads and away from wetlands where birds may be located. A portion of this activity does occur in wetland or semi-wetland areas, or in low scrub where birds may be nesting—and naturally more secretive in behavior. Training activities are not allowed in vernal pools under the No Action Alternative. The overall impact on birds is short-term and minor; further the overall impact is on an individual species and not overall population level.

Activities that disturb sediment, such as pile driving associated with ELCAS, which is infrequent, may cause turbidity in the water and could temporarily affect the foraging success of fish-eating birds, including the federally endangered California least tern and brown pelican.

Noise impact could potentially, but likely negligibly affect migratory bird individuals under the No Action Alternative.

### 3.12.6.2 Alternatives 1 and 2

Increases in training under Alternatives 1 and 2 may result in increased impacts to the nesting and foraging of migratory birds, in addition to the California least tern and western snowy plover. Impacts to nesting and fledglings during the breeding season would be higher on the beaches where individual or colonial nesting occurs. Similar disruption of nesting could occur in the inland area of SSTC-S because of the physical impact of foot and vehicle activity, as well as the use of pyrotechnics; but no permanent habitat loss is expected. Much of the existing vegetation is iceplant, which supports low habitat value.

Overall, the protection from urban development afforded by the security and safety requirement of military training activities has maintained the habitat for a wide array and abundance of migratory birds.

A summary of effects by alternative is presented in Table 3.12-17.

**Table 3.12-17: Summary of Effects**

| Alternative | Effects |
|---|---|
| **No Action Alternative** | • Current management practices restrict activities from occurring in some nesting areas during the breeding season, particularly three SSTC-N beach lanes Blue 2, Orange 1, and Orange 2 as well as Delta North and South.<br>• Potential impacts from air and marine vessel activities, as well as LCAC activities are expected to be minimal to nesting species, as activities typically occur or are scheduled for areas with no or minimal nesting.<br>• If there are birds found diving or circling around an underwater detonation point, activities will be halted until the birds have left the area, which minimizes the potential for blast impacts to diving birds.<br>• Habitat for nesting and foraging migratory land birds, as well as for shorebirds and seabirds may be degraded due to the presence of foot traffic and from land detonations and pyrotechnics. None of these temporary effects are expected to have an adverse effect on migratory birds at the population level.<br>• The majority of beach activities occur away from nests on the beach, generally below the high tide line. Activities occurring near the nesting area potentially affect nesting birds. However, current management practices minimize adverse effects.<br>• Loss in California least tern nesting historically has been and is expected to continue to be small when compared to overall nesting levels. Current mitigation measures well compensate for these losses. |
| **Alternative 1** | • Alternative 1 would have additional effects on birds. The increased frequency and intensity of these activities would encourage birds to avoid the area.<br>• Vehicle patrolling and testing at SSTC-N would minimally impact nesting migratory birds or shorebird foraging under this Alternative, because these activities would be restricted to specific training lanes.<br>• Habitat for nesting and foraging migratory land birds, as well as for shorebirds and seabirds would be degraded due to the presence of foot traffic, and noise from pyrotechnics. While impacts to nesting habitats would increase under this Alternative, existing infrastructure, training requirements, scheduling needs, and mitigation measures will naturally pull activities away from these habitat areas, minimizing impacts. None of the temporary effects from training are expected to have an adverse effect on migratory birds at the population level.<br>• Losses in California least terns and western snowy plover nesting is expected to be minimally increased from current, No Action Alternative levels. Current and proposed mitigation measures well compensate for these losses.<br>• The Navy has consulted with the USFWS under Section 7 of ESA. The USFWS concluded that the proposed action is not likely to jeopardize the continued existence of ESA-listed species. |

**Table 3.12-17: Summary of Effects (Continued)**

| Alternative | Effects |
|---|---|
| **Alternative 2** | • Effects are the same as described for the No Action Alternative for air and marine vessel activities as well as LCAC and ELCAS activities. Effects of other activities are generally the same as Alternative 1.<br>• Under Alternative 2, training has the option of going into Lanes 8, 9, and 10 and impact nesting birds there. Migratory birds that coincidently use this area would also be impacted. Military activities will not often go into these training lanes, however, due to the infrastructure, training requirements, scheduling needs, and mitigation measures causing activities to naturally gravitate away from nesting areas.<br>• Losses in California least terns nesting is expected to increase, and losses to western snowy plover nesting is expected to be minimally increased from current, No Action Alternative levels. Current and proposed mitigation measures well compensate for these losses. |
| **Mitigation Measures** | • Current mitigation measures include: communication and coordination of training area protocols, nest relocation, predator management and control, habitat modification, site preparation, nest substrate enhancement, signage and education, recreational use restriction, rearing of collected eggs, injured, and sick individuals, a western snowy plover health study, and monitoring.<br>• Under Alternative 1, vehicle patrolling and LARC V Operator Training would not occur in Red, Blue or Orange Beach Lanes. Observation for birds will be conducted prior to and after underwater detonations and detonation activities would be delayed if flocks of diving birds are present. Mitigation measures are described in detail in Sections 3.12.4, 3.12.3.2.1, 3.12.3.2.2 and 3.12.3.2.3.<br>• Develop and implement a Long-term Site Enhancement Plan that includes invasive vegetation control on SSTC oceanside beach lanes, establishing dunes on the windward (west) edges of Delta North and South that would enhance this area for plovers, create a source of sand for the least tern nesting area, and establish a better visual barrier between SR-75 and the nesting colony.<br>• Install temporary barriers and improved signage on the southern end of SSTC-N to more clearly notify the public of the Navy's exclusive use of SSTC-N beach and existing restrictions on public usage of those beaches.<br>• The Navy will consider the tide conditions when developing training schedules, and schedule training activities that could be conducted on the hardpack during low tides when consistent with training needs.<br>• The Navy will mark and buffer up to 22 concurrent snowy plover nests established at SSTC-N and SSTC-S beaches plus any additional nests that exceed 22 that are initiated in beach lanes Orange 1 and Orange 2. |

**Table 3.12-17: Summary of Effects (Continued)**

| Alternative | Effects |
|---|---|
| **Mitigation Measures (Continued)** | • Under baseline conditions, the southern 3 beach lanes are marked to facilitate avoidance of tern and plover nests. The Navy is developing a marking strategy to delineate least tern and snowy plover nesting areas that does not encumber training activities. Such a marking strategy may entail signage affixed to existing beach lane sign posts and a limited number of additional markers.<br><br>• If relocation of any least tern or snowy plover nest/egg is necessary as a protective measure, each nest/egg will be relocated the shortest distance possible into suitable habitat by Service-approved monitors to increase the chances for nest success. The weekly reports to be submitted to the CFWO under the proposed project will include: a) date the nests/eggs were moved, b) number of nests/eggs moved, c) original and ending location of nests/eggs moved, and (d) distance the nests/eggs were moved.<br><br>• The Navy will delineate the boundary of SSTC-S that parallels the mean high tide line in a manner that does not encumber training exercises.<br><br>• The NBC Natural Resources staff will brief all dog handlers annually, or more frequently if necessary, of guidelines pertaining to the use of military working dogs on SSTC beaches. Military working dog handlers will be notified weekly of the locations of plover nests and, to the maximum extent possible, remain a minimum of 30 m (90 ft) from markers that delineate the locations of nesting plovers. Outside of the nesting season (15 Sept through end of February), training may occur unencumbered.<br><br>• Physical conditioning will primarily occur on the hard pack sand on SSTC oceanside beaches. If physical conditioning on soft pack sand is necessary, handlers and military working dogs will run on the sand road (SSTC-N only) or within 20 feet of the hard pack sand (SSTC-S only) to reduce the disturbance and impact to nesting terns and plovers.<br><br>• At SSTC-N, military working dogs will exercise primarily between beach lanes Yellow 1 and Blue 1, where they may cross the beach to get to the sand road at the existing route immediately to the north of the demo pit. The Navy will not conduct physical conditioning using dogs in the southern three beach lanes until: a) completing a study to evaluate the effects of military working dogs on terns and plovers and b) coordinating with the USFWS to develop conservation measures to minimize any additional effects. The Navy will submit the study design and scope of work to the Service for review and approval. The Navy will allow the Service 30 days to submit comments and an additional 30 days to approve the final study design and scope of work.<br><br>• If military working dog training is requested as part of Platoon Over-the-Beach activities at SSTC-N, these activities will be scheduled in beach lanes Yellow 1, the north half of Yellow 2, Green 1 or Green 2, pending the results of the Navy's study to evaluate the response of terns and plovers to military working dog presence. |

**Table 3.12-17: Summary of Effects (Continued)**

| Alternative | Effects |
|---|---|
| **Mitigation Measures (Continued)** | • The Navy will coordinate with the Service in the development of the Long Term Habitat Enhancement Plan for SSTC and will submit the plan to the Service for review and approval. The Navy will allow the Service 30 days to submit comments and an additional 30 days to approve the final study design and scope of work.<br>• The Navy will include the following information in the yearly reports to be submitted to the USFWS under the proposed project: a) the number and distribution of terns and plovers observed in each training lane; b) the number of any dead or injured least terns or snowy plovers (including eggs, chicks or adults) observed in each training lane; c) the hatching rate of terns and plovers in each beach lane; d) maps of the locations of tern and plover roosts within the action area; e) the timing and number of training events within the southern 3 beach lanes, and other beach lanes, to the extent available; f) the date and condition of any dead or injured tern or plover; and g) any measures taken to prevent additional tern or plover death or injury.<br>• The Navy will provide Commission staff monitoring reports prepared for the U.S. Fish and Wildlife Service under the July 7, 2010 Biological Opinion.<br>• Consistent with other applicable laws and to the extent possible and practical, the Navy will maintain signs and enforce the existing ban on the public bringing nonmilitary working dogs to Navy-controlled beaches. |

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# 3.13 Cultural Resources

## 3.13 CULTURAL RESOURCES

This section addresses the baseline level of naval activities at the Silver Strand Training Complex (SSTC), as well as proposed alternatives, and analyzes their potential effects on archaeological resources, submerged archaeological resources, architectural resources, and historic resources, as defined in the sections below.

### 3.13.1 Affected Environment

#### 3.13.1.1 Introduction

##### 3.13.1.1.1 Definition

Cultural resources or heritage resources are districts, buildings, sites, structures, areas of traditional use, or objects with historical, architectural, archaeological, cultural, or scientific importance. These resources can be divided into three categories: archaeological (prehistoric and historic) resources, architectural resources, and traditional cultural resources. To be considered significant in the federal planning process, heritage resources must be eligible for nomination to the National Register of Historic Places (NRHP), as discussed below.

**Archaeological Resources**

Archaeological resources include prehistoric and historic sites where humans have caused detectable changes or left artifacts, ecofacts (charred seeds, bone, and shell), features, or other deposits. Prehistoric sites in San Diego County occur from prior to 9,000 years before present (B.P.) until the founding of the San Diego Mission and Presidio—the first Spanish settlement in Alta California—in 1769. Prehistoric artifacts consist of flaked stone tools, cores and waste flakes, groundstone tools, ceramics, and ecofacts. Archaeological components consist of deposits in the same site area that date to different times. A site may have an historic and a prehistoric component; a site's surface component refers to materials on the ground surface and its subsurface component—buried materials.

Historic archaeological resources are those sites or components dating after European settlement—1769 in San Diego County. These resources may include subsurface structures or features, such as wells, cisterns, or privies. Other historic archaeological remains include artifact concentrations, and building or structure foundations. Historic sites, buildings, structures, and objects must be at least 50 years old or they must be of exceptional importance to be considered significant for National Register Criteria Consideration G.

**Submerged Archaeological Resources**

Submerged or underwater archaeological resources consist of both historic and prehistoric resources. Submerged historic resources consist of shipwrecks, wharves, or sunken aircraft. Underwater prehistoric sites consist of the remains of campsites and artifact scatters. Prior to 9,000 years ago (early Holocene), when people first arrived in the San Diego Region, the sea level was approximately 20 meters below that of today and the coast line was three to four thousand meters west of its current location (Masters 1988). All prehistoric campsites or villages located at or near the coast line during the early- and mid-Holocene are now underwater. The number of recorded underwater prehistoric sites in southern California is low because there has been very little underwater archaeological survey. Underwater surveys of Ballast Point, located to the south of Cabrillo National Monument, have identified nine locations of underwater cultural material that have been located and recorded as well as two shipwreck sites that have been located through core sampling (Kelly and May 2001).

All identified submerged historic archaeological resources in the vicinity of SSTC consist primarily of shipwrecks; however, no underwater prehistoric sites have been surveyed or identified within the SSTC activity areas.

### Architectural Resources

Architectural resources consist of standing buildings and structures. For heritage resource management purposes, a building is something built to shelter or enclose humans or their activities, such as a house, school, barn, or factory. A structure is something built for other purposes, such as a dam, bridge, or silo. To be significant, architectural resources must be at least 50 years old or they must be of exceptional importance to be considered significant for National Register Criteria Consideration G.

Some Cold War-era military buildings and structures may be considered significant under Criteria Consideration G.

### Traditional Cultural Resources

Traditional cultural resources are sites, buildings, structures or objects that are closely associated with beliefs and cultural practices of a living culture, subculture, or community. Called traditional cultural properties (TCPs), these sites must be at least 50 years old or they must be of exceptional importance to be considered significant for National Register Criteria Consideration G.

These beliefs and practices must be rooted in the group's history and must be important in maintaining their cultural identity.

### 3.13.1.1.2 Regional Setting

The Silver Strand peninsula is approximately five miles long and connects the City of Coronado to the City of Imperial Beach. The peninsula forms the western boundary of San Diego Bay. It is characterized by flat coastal beaches along its western edge. The eastern edge consists of developed areas, such as SSTC—the northeastern portion of the penninsula—and Coronado Cays, a residential development on the eastern side of the strand. Tidal flats are located in the southern portion of the strand.

### Prehistory

Human occupation of coastal southern California began in the Paleo-Indian period (11,500-8500 B.P.). Characterized by the San Dieguito Complex in the San Diego Region, these early inhabitants supported themselves through generalized hunting and gathering. The San Dieguito assemblage consists of finely flaked leaf-shaped projectile points, choppers, scrapers, and crescentic stones.

The following Archaic period (8500-1300 B.P.) encompassed both a coastal focus called the La Jollan Complex and an inland focus called the Pauma Complex. A large population existed along the coast during this period. Most sites related to this period consist of large shell middens: an abundance of manos and slab and basin metates: crude, cobble-based choppers, scrapers, and cutting tools. A few bone items, and shell beads characterize the artifact assemblage. Subsistence was based on hard seed and shellfish collection.

The Late Prehistoric period (1300-200 B.P.) is marked by the appearance of small projectile points, which signifies the advent of the bow and arrow, the appearance of ceramics, and the replacement of inhumations with cremations. Ethnographically, the Tipai/Ipai, classified as part of the Yuman language family, inhabited the area. Early mission records indicate as many as 58 villages existed in the San Diego area.

### Early Historic Period

Juan Cabrillo, who explored the Alta California (Upper California) coast in 1542, was the first recorded European to visit the San Diego Region. In 1565, the Spanish initiated regular trade between Acapulco and Manila. Manila Galleons sailed along the coast of Alta California on their trip back to Acapulco and occasionally stopped for water and food. Sporadic visits by various explorers continued through the 17th and 18th centuries. Native populations were wiped out by diseases introduced by Spanish maritime explorers, the Manila Galleon, and native traders and travelers from Sonora and Baja California during this time (Preston 2002). The first Spanish presence in Alta California occurred in 1769, when a mission and presidio were established at San Diego. From the 1700s to the mid-1800s, the Silver Strand area was used primarily for livestock grazing. By the 1840s, a wagon road existed along the Silver Strand peninsula. Anglo-Americans began settling on Silver Strand in the 1860s. The town of Oneonta appeared south of Imperial Beach in 1882. During this period, a whaling station was established on North Island.

In the 1880s, southern California experienced a land boom, and many speculative, paper towns were created. In 1884, some local businessmen purchased the Peninsula of San Diego, a former Mexican rancho, to develop the resort of Coronado and build Hotel del Coronado. The first recorded development in the area was a road graded along Silver Strand peninsula in anticipation of eager land buyers. Coronado Heights and South Coronado were laid out in this area in 1887. However, these towns were not successful, and the land was purchased by John D. Spreckels (Department of the Navy [DoN] 1997). In 1889, Coronado Belt Line Railroad Company began operating a steam train connecting Hotel del Coronado with San Diego. The train line followed the shoreline of the San Diego Bay through SSTC-South (SSTC-S) and the site of Coronado Heights, then it proceeded south through Imperial Beach, east to the San Diego Saltworks and north to National City and San Diego.

In 1894, Zuniga Jetty was built to help keep sand from blocking the mouth of San Diego Bay. This sand was brought north from the Tijuana River estuary by the California Countercurrent. A temporary railroad was built on North Island—and on scaffolding over the ocean—to bring in the rock to construct the jetty. After the jetty was built, sand accumulated east of the jetty which enlarged North Island at its southwestern tip (Masters 1988). This area is now called Breaker Beach.

### 20th Century Developments

Around 1900, the Tent City resort was established by John Spreckels just south of Hotel del Coronado and north of SSTC-North (SSTC-N). The City of Coronado grew up around the hotel. The Curtiss School of Aviation was established on North Island in 1911, and the Navy moved its aviation camp there in 1912. The U.S. Naval Air Station was officially established in 1917, with 524 acres on North Island. The Army maintained an aviation station adjacent to the Navy facilities until 1935. Also in 1935, growth of the town of Coronado forced Tent City to close.

In 1920, the Navy established a small radio compass station at the present-day YMCA Surf Camp on SSTC-S, to aid ships in navigation. Coronado’s Tent City was dismantled in 1939 (Brandes and Carlin 1988). Between 1930 and 1942, areas along Silver Strand were filled with materials dredged from San Diego Bay. The Army acquired land from the Spreckels Company in 1942 to establish Fort Emory (present-day Naval Amphibious Base [NAB] Coronado) to the north of the Navy’s small radio compass station. Massive reinforced concrete gun emplacements and associated buildings were constructed for coastal defense.

Between 1940 and 1946, approximately 26 million cubic yards of sediment were dredged to deepen San Diego Bay to accommodate larger Naval vessels. Much of this was used to fill Spanish Bight, the bight or cove that separated North Island from Coronado Island. Much of the land lying east of Highway 75 (Silver Strand Boulevard) along SSTC-N, including the NAB Coronado cantonment proper, consists of fill which was deposited at that time (DoN 2002). In contrast, most of the oceanside of Silver Strand and Coronado Island consist of in situ deposits. In 1942, the Zuniga Jetty was improved and extended. This kept the channel to San Diego Bay free from sand deposits. Breakers Beach, lying on the southwest side of Naval Air Station North Island (NASNI), has naturally built out as a result of the construction of Zuniga Jetty (Integrated Publishing 2009; Scanlon 2007). This sand buildup is brought north by the California Countercurrent from the Tijuana River estuary (Masters 1988).

By 1944, the threat of Japanese invasion was reduced and the Navy obtained Fort Emory from the Army to use as a training station. The Navy designated the site as the Amphibious Training Base Fort Emory, in conjunction with the amphibious training center located on Coronado (SSTC-N) in 1943. In 1946, the Amphibious Training Base was renamed the Naval Amphibious Base. In 1948, the Navy established a radio technical training school in conjunction with the radio station. The Navy acquired the Army's land holdings on Silver Strand in 1952. Several new buildings were constructed, and the old batteries were used to store equipment. The Wullenweber Antenna array and headquarters were built in 1965. These areas became part of the Naval Amphibious Base in the 1990s.

#### 3.13.1.1.3 Region of Influence

The Region of Influence for cultural resources includes all of SSTC-N and SSTC-S, portions of NASNI, the boat lanes and ocean anchorages offshore of SSTC, and the bayside training areas within San Diego Bay. Resource concerns for Silver Strand include prehistoric and historic archaeological resources and architectural resources. Cultural resource issues for the nearshore and offshore ranges primarily involve potential effects on underwater historic sites.

### 3.13.1.2 Regulatory Requirements

Cultural resources are unique and nonrenewable. Where located on federal land, these resources are subject to the regulatory requirements of the National Historic Preservation Act (NHPA) of 1966, the American Indian Religious Freedom Act of 1978, the Archaeological Resources Protection Act of 1979, and the Native American Graves Protection and Repatriation Act of 1990 (NAGPRA).

For the purposes of this EIS, compliance with Section 106 of the NHPA and 36 Code of Federal Regulations (CFR) 800 has been previously accomplished under the San Diego Metropolitan Area Programmatic Agreement (Metro Area PA), executed in February 2003 between the Commander Navy Region Southwest (CNRSW), the Advisory Council on Historic Preservation (Council) and the California State Historic Preservation Officer. The Metro Area PA provides for CNRSW determinations of an undertaking's area of potential effect (APE), identification of potentially affected historic properties, and assessment of "no historic properties affected" and "no adverse effect" without the further consultations with the California State Historic Preservation Officer (CASHPO) normally required under 36 CFR 800.

Under the Section 106 compliance process promulgated by 36 CFR 800, only "historic properties" are subject to assessment of adverse effect. A historic property is any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the National Register of Historic Places maintained by the Secretary of the Interior. This includes artifacts, records, and remains that are related to and located within such properties. The term historic property also includes properties of traditional spiritual and/or cultural importance to an Indian tribe, ethnic group, or subculture. TCPs must also meet criteria for listing on the NRHP. National Register eligibility criteria are published under 36 CFR 60.4. A district, site, building, structure or object is eligible to the National Register if it: (a) is associated with major historic events; (b) is associated with the lives of historically significant individuals: (c) embodies the distinct characteristics of a type, period, or method of construction, is the work of a master, possesses high artistic value, or represents a significant an distinguishable entity whose components may lack individual distinction: or (d) has yielded, or may be likely to yield, information important to history and prehistory.

Determinations of eligibility for historic properties within the SSTC are made either in consultation with the CASHPO or by the Coordinated Resource Management & Planning Council (CRMP) in accordance with Stipulation 7[1] and 8[2] of the San Diego Metro Area PA.

### 3.13.1.3 Silver Strand Training Complex-North

#### 3.13.1.3.1 Archaeology

As mentioned in 3.13.1.1.2, the training areas in SSTC-North are located on fill deposits that resulted from the dredging of San Diego Bay and the construction of the Zuniga Jetty. These fill areas have no potential for *in-situ* heritage resource deposits. In the early 1900s, prehistoric archaeological site CA-SDI-59 was identified. A recent survey identified four sites (CA-SDI-14411, CA-SDI-14412, CA-SDI-14413, and CA-SDI-14414) along with several artifacts in a secondary context associated with the fill (Dolan and Apple 1998). Table 3.13-1 contains a description of these sites.

**Table 3.13-1: Archaeological Resources within the Project Limits at SSTC-N**

| Resource Designation | Description | NRHP Status |
|---|---|---|
| CA-SDI-59 | Shell and fire-affected rock scatter. Excavated in 1976 and Late Prehistoric and Archaic components were identified (Follette 1976). The site may have been destroyed by road construction or covered by associated fill. | NE |
| CA-SDI-14411 | Shell and lithic scatter. May represent a disturbed shell-processing camp. It consists of a shell scatter with associated flakes. Fire-affected rock also is present. This site has been damaged or perhaps destroyed by road and utilities construction. | PE |
| CA-SDI-14412 | Shell and lithic scatter. Consists of a shell scatter with two flakes and one piece of fire-affected rock. The site is a secondary deposit probably pushed from its original location to form a utility berm. | PE |
| CA-SDI-14413 | World War II (WWII) historic trash dump/camp. Artifacts include burned wood and charcoal, glass, metal, and other trash. It dates to the World War II (WWII) era and may reflect early military activity in the area. | PE |
| CA-SDI-14414 | Shell scatter. A disturbed prehistoric shell concentration primarily consisting of Pismo clams. No artifacts were observed at the site. | PE |

Notes: NE - Not Eligible; PE - Potentially Eligible.

These four sites may be eligible for the National Register, but their eligibility cannot be determined without testing and evaluation of the resources. Because the project is located in areas with fill and aeolian sediments, additional buried archaeological resources may be present.

[1] 7. Professional investigations have identified eligible and potentially eligible properties within the CNRSW Metro ROI. In conjunction with ICRMP development and as future investigations, CNRSW will determine if additional properties in the Metro ROI not previously evaluated may be eligible.

[2] 8. CNRSW will ensure that all new construction, alterations, equipment installation, structure modifications, or repairs and maintenance on land, buildings, or structures will be reviewed for potential effects to historic properties.

### 3.13.1.4 Silver Strand Training Complex-South

#### 3.13.1.4.1 Archaeology

As reviewed in a previous section, the bayside north of the Silver Strand State Beach in SSTC-N consists of fill that resulted from dredging of San Diego Bay. The former Cantonment area of the Naval Radio Receiving Facility (NRRF now SSTC-S) is not on fill, but the northern portion of that area has been disturbed during the grading for the Coronado Heights development (Underwood 2008). Fifteen archaeological sites are recorded within SSTC-S. One of the sites (CA-SDI-5454/12270) has been determined to be eligible for listing on the NRHP. Two additional sites (CA-SDI-5514 and CA-SDI-13968) are considered to be eligible. Five of the sites were recently investigated, and recommended to be ineligible for listing (Underwood 2008). Another seven known sites may be eligible for the National Register, but their status has not been determined. These sites are summarized in Table 3.13-2.

**Table 3.13-2: Archaeological Resources within the Project Limits at SSTC-S**

| Resource Designation | Description | NRHP Status |
|---|---|---|
| CA-SDI-57/H | Lithic and shell scatter; historic debris. Highly disturbed. No intact subsurface deposit. A small prehistoric campsite that also contains historic materials. Prehistoric artifacts include shell and lithics. Historic debris consists of domestic and construction materials. The majority of the site was destroyed by construction of SR-75. This site was subjected to archaeological testing in 2007 and recommended ineligible for listing on the National Register (Underwood 2008). | NE |
| CA-SDI-5454/12270 | A very large, multilocus site with a substantial shell midden, it was originally recorded as two separate sites; both consisting of extensive lithic and shell scatters with numerous metavolcanic flakes, fire-affected rock, and groundstone artifacts. Reexamination during the 2001 Coronado Undergrounding Project found that the area of CA-SDI-5454 extended into the boundaries recorded for CA-SDI-12270. This overlap resulted in their being redocumented as a single site. Much of the site had been significantly affected by 1940s, and later construction of SR-75 and an adjacent railroad berm. The principal intact portion of CA-SDI-5454/121270 extends for approximately one kilometer along the western side of SR-75, with more disturbed, remnant components lying deeply buried along 600 meters of the eastern, bay-margin side of the highway. Fragments of human remains were also found during the 2001 Coronado Undergrounding Project. This resulted in the site being treated as a TCP, with the participation and concurrence of Kumeyaay tribal representatives. | E |
| CA-SDI-5514 | Lithic and shell scatter. A scatter of shell and flaked stone. Sometime in the past, shell-laden dredge material was dumped on the eastern end of the site. An intact portion of the site was identified during the Coronado Undergrounding Project archaeological investigations (Pigniolo et al. 2001). For that project's Section 106 consultation, this site was assumed to be eligible for listing, and testing for effect indicated that the site would not be disturbed by that undertaking (Pigniolo et al. 2001). | E* |

**Table 3.13-2: Archaeological Resources within the Project Limits at SSTC-S (Continued)**

| Resource Designation | Description | NRHP Status |
|---|---|---|
| CA-SDI-13964/H | Lithic and shell scatter; historic debris. Highly disturbed. Recorded as a prehistoric shell and lithic scatter. Two artifacts recovered. No intact subsurface deposit. Test excavations documented that this site consists of secondary deposits: prehistoric shell and lithics mixed with historic and modern materials. There are late 19th century domestic refuse and construction debris, possibly associated with Coronado Heights and later materials probably associated with Camp Emory and World War II coastal defenses. The site was recommended ineligible for the National Register (Underwood 2008). | NE |
| CA-SDI-13965H | Historic period refuse scatter. A very small scatter of historic period debris. Initially reported as dating from 1900 to 1930. The site is in a partially stabilized dune, and additional material may be present. | PE |
| CA-SDI-13966 | Lithic and shell scatter. Highly disturbed site mixed with modern refuse. No intact subsurface deposit. Recorded as a low-density lithic and shell scatter. This site was subjected to archaeological test excavation in 2007 and found to be a mixed secondary deposit. It was recommended ineligible for listing in the National Register (Underwood 2008). | NE |
| CA-SDI-13967 | Lithic and shell scatter. A small prehistoric site located in a portion of SSTC-S leased by the YMCA Surf Camp. The site is composed of flaked lithics and shell. | PE |
| CA-SDI-13968 | Lithic and shell scatter. A large low-density scatter of flaked stone and marine shell. This site may be the remnant of a site recorded at the Museum of Man as W-194B. | E* |
| CA-SDI-13969 | Lithic and shell scatter. Highly disturbed. Mixed with dredge spoils. No intact subsurface deposit. Recorded as a shell and lithic scatter with cobble features, shell concentrations, and fire-affected rock. This site was subjected to archaeological test excavation in 2007. The marine shell was found to be dredge spoil and the cobble feature proved to be recent. A few artifacts were noted, but there were modern materials throughout the soil column suggesting that the site area had been graded. The site was recommended ineligible for listing in the National Register (Underwood 2008). | NE |
| CA-SDI-13970 | Lithic and shell scatter. A small site comprised of flaked stone and marine shell. Ground visibility in the area is poor due to vegetation cover. The site is located in a depositional environment and a subsurface deposit is possible. | PE |
| CA-SDI-13971 | A low-density lithic and shell scatter. Previously determined ineligible by Naval Facilities Southwest (NAVFAC SW) CRMP (CRMP Program files). | NE |
| CA-SDI-13972 | Lithic and shell scatter. Highly disturbed. Mixed with modern refuse. No intact subsurface deposit. Recorded as a low-density lithic and shell scatter. Test excavation in 2007 revealed that this site was a secondary deposit. It was recommended ineligible for listing in the National Register (Underwood 2008). | NE |

**Table 3.13-2: Archaeological Resources within the Project Limits at SSTC-S (Continued)**

| Resource Designation | Description | NRHP Status |
|---|---|---|
| CA-SDI-13973H | Historic period debris scatter. A low- to moderate-density scatter of domestic and construction debris. Bottle glass, lumber, metal can fragments, cement, and asphalt were noted at the site. The site does not appear to include a subsurface deposit. | PE |
| CA-SDI-13974/H | Foundations and historic debris scatter; lithic and shell scatter. Historic foundations and debris associated with Fort Emory. This includes 20 plus cement foundations, a cement pond, and historic construction debris. In addition, prehistoric component is present, consisting of a low-density prehistoric lithic scatter. Concurrent with the determination of National Register eligibility for the discontinuous Fort Emory Coastal Battery historic district, the surrounding "historic archaeological" landscape, comprised of features associated with demolished buildings and structures from the Amphibious Training Base Fort Emory, was determined to not eligible. Due to the highly developed and disturbed context of this landscape, the "low density prehistoric lithic scatter" was also determined ineligible. | NE |

Notes: NE - Not Eligible; PE - Potentially Eligible, E - Eligible. *Treated as eligible (Pigniolo et al. 2001).

### 3.13.1.4.2 Built Environment

The WWII-era Fort Emory Coastal Battery Historic District was part of a system of defenses along the West Coast, which grew out of plans made by the Army Coastal Artillery Corps between 1915 and 1936. In 1941, the Army moved four 155mm artillery pieces from Fort Rosecrans to the Coronado Heights area to quickly improve San Diego coastal defenses. This gun emplacement was called Battery Imperial. In October 1942, the Army acquired 412 acres in the Coronado Heights area (a Taking Action) and, in December 1942, Fort Emory was dedicated in honor of Brigadier General William H. Emory. The Fort eventually consisted of Battery Imperial, Battery Grant, Battery 134 (informally known as Battery Gatchell) and associated plotting and sighting rooms, and other support buildings. Battery Grant, which superseded Battery Imperial, consisted of six-inch guns. Construction of Battery Grant began in 1942 and was completed in 1943. Construction began on Battery Gatchell in 1943. It was to consist of 16-inch guns, but was never completed. The batteries on what is now the SSTC were part of a large harbor defense system centered at Fort Rosecrans on Point Loma (California State Military Museum 2008; DoN 1997). The Colorado Railroad was moved east in 1942 to avoid Fort Emory. This post-1942 route is now the route of a City of Coronado bike path.

As the war wound down in 1944, the Navy took over a portion of Fort Emory to expand their radio receiving station located adjacent to Fort Emory to the south. This eventually became the NRRF at SSTC-S. The Army ceded the balance of Fort Emory to the Navy in 1950 (California State Military Museum 2008). By 1963, the Navy had demolished most of the buildings. Only the batteries and water tanks remained. The large Wullenweber Antenna array and the radio receiver building (Building 1) were constructed in 1965. The array was one of 14 built around the world by the Navy as part of its global communications system. Prior to being incorporated under Naval Base Coronado in 1998, SSTC-S was under NAVCOMTELSTA San Diego, which operated the Wullenweber antenna facility.

In 1997, historic resources evaluations of the NRRF buildings and structures were conducted at SSTC-S. As part of that effort, the Fort Emory Coastal Battery Historic District was defined. Consisting of five buildings, it was nominated to the National Register under Criteria A and C (DoN 1997). The 1997 historic resources evaluation omitted a determination of the Wullenweber Antenna properties because of a lack of access to sensitive information. Subsequently, these properties were decommissioned; then they were addressed during the state-wide Cold War Era evaluations initiative and recommended as National Register eligible. Under Stipulation 7 of the San Diego Metro Area PA, the CRMP concurred in this determination, and the antenna and radio receiver building are now considered historic properties. The Wullenweber antenna structure, exclusive of Building 1, has been scheduled by Naval Base Coronado Public Works Office for demolition, an adverse effect under 36 CFR 800.5. In response, the CRMP is consulting with the CASHPO for resolution of the adverse effect, which is proposed to be by documentation under a previously consulted Alternative Documentation Standard protocol. Building 42, the Terminal Receiver Building, two former diesel storage tanks, and two water reservoirs have been evaluated and recommended ineligible (DoN 1997) (Table 3.13-3).

**Table 3.13-3: Historic Buildings and Structures within the Project Limits at SSTC-S**

| Resource Designation | Description | NRHP Status |
|---|---|---|
| | Wullenweber Antenna | E |
| Building 1 | Radio Receiver Building (associated with the Wullenweber Antenna) | E |
| Building 42 | Terminal equipment building | NE |
| 901 | Reservoir potable | NE |
| 902 | Reservoir potable | NE |
| CA-SDI-13073H | Coronado and San Diego Railroad, a 29-kilometer portion of the historic Coronado and San Diego Railroad including the railroad grade, track, ties and bridges.[1] | E and PE |
| Bunker 98 | Operational storage (Plotting and Spotting Room) | E |
| Bunker 99 | Receiver building (Battery 134 [Gatchell]) | E |
| Bunker 100 | Antenna maintenance shop (Battery Grant) | E |
| 911 | Former diesel oil storage tank (Battery Grant) | E |
| 912 | Former diesel storage tank (Battery Grant) | E |
| – | Battery Imperial (artillery foundation features) | E |

Notes: NE - Not Eligible; PE - Potentially Eligible, E – Eligible
[1] Slightly more than 1.6 kilometers (1 mile) of the track documented on the CDPR site record crosses the eastern margin of SSTC-S. This alignment was built in 1942 and is now a City of Coronado bike path. However, the existing DPR site record does not include an abandoned loop from the pre-1942 alignment of this railroad that remains partially preserved within the northern portion of SSTC-S. This portion of the railroad has not been evaluated for significance. NAVFAC SW will record and evaluate this portion of the site.

#### 3.13.1.4.3 Traditional Cultural Properties

In 1992, amendments to the National Historic Preservation Act defined a new historic property type: the TCP. This type of property derives its significance from its association with traditional cultural practices or beliefs of an ethnic group, subculture, or community. For example, a place where traditional economic activities were undertaken, such as a place for gathering particular plant foods could qualify as a TCP. The site of some artistic activities, such as a prehistoric rock art panel or a mountain, mentioned in an origin account or migration myth might qualify as a TCP. A TCP is a resource that is eligible for inclusion in the National Register because of its association with the cultural practices or beliefs of a living community. These beliefs must be rooted in the community's history and they must be important in maintaining the continuing cultural identity of the community. The place itself, like other types of historic properties, must be at least 50 years old.

As previously noted, SSTC-S contains one eligible archaeological site, CA-SDI-5454/12270. This eligible site is a very large, multilocus site with a substantial shell midden, it was originally recorded as two separate sites; both consisting of extensive lithic and shell scatters with numerous metavolcanic flakes, fire-affected rock, and groundstone artifacts. Fragments of human remains were also found during the 2001 Coronado Undergrounding Project. This resulted in the site being treated as a TCP, with the participation and concurrence of Kumeyaay tribal representatives (Kumeyaay Cultural Repatriation Committee) during NAGPRA consultation.

### 3.13.1.5 Submerged Archaeological Resources

Underwater prehistoric sites or isolated objects may be located in the southern NASNI beaches, offshore waters and in the offshore waters along Silver Strand. The potential for cultural resources is high; however, no submerged prehistoric sites have been previously recorded within the project area. When the first people arrived in the San Diego Region, before 9,000 B.P., during the time archaeologists call the early Holocene, the sea level was perhaps 20 or more meters below mean sea level of today. The coastline was about three to four kilometers west of its present location. It is highly likely that submerged archeological sites exist in this area. San Diego Bay and the Silver Strand date from approximately 6,000 years ago during the mid-Holocene (Masters 1988) and prehistoric Indians evidently made use of the SSTC area since that time. Given the extensive use of shellfish and other intertidal resources by prehistoric populations, and the long period during which the area was occupied, it is likely that they made substantial use of the marshes and mud flats that existed along Silver Strand and those that are submerged a short distance offshore today.

The potential for historic remains is also high. Several shipwrecks have occurred within San Diego Bay and in the offshore waters (Figure 3.13-1) (National Oceanic and Atmospheric Administration 2005). The recorded locations of these resources are often inaccurate and the extent of their remains uncertain, due in part to the poor quality of information provided by survivors, in part to the effects of currents and other natural process, and in part to disturbance (e.g., dredging). The fate of many lost ships, especially from the first European contact to the mid-1880s, is simply unknown.

Considerable cultural activity surrounding Point Loma make it likely to find sunken vessels, lost fishing boats, dumped aircraft, and military equipment offshore of Ballast Point. The 1981 survey off of Ballast Point located nine locations of underwater cultural material to the west of the Zuniga Jetty (Kelly and May 2001). The survey also documented two wreck sites. Any recovery of these resources has been deemed too difficult based on the depth of the locations and the seasonal sand deposition that has covered the potential resources in the area.

On the bayside of the Silver Strand peninsula, at least three shipwrecks appear to be in or near the training beaches. An unnamed wreck is recorded in shallow water at the northern end of Delta South beach (Figure 3.13-1). An unnamed wreck is recorded in the middle San Diego Bay, along the outer edges of Delta I and Echo training areas. Finally, an unnamed wreck is recorded at the mouth of Fiddler’s Cove at a depth of about 27 feet. The ages of these wrecks, and their cultural value, are not known.

On the ocean side of the peninsula, there are at least three shipwrecks in the vicinity of the SSTC training areas. In the areas of Boat Lanes 2 and 3, a bark built in 1883 called the Narwhale sank in 1934. Off of SSTC-S, the submarine S-142 sank. A little farther south, in Boat Lane 13, the Subchaser YC689 was grounded in 1943. The destroyer USS Hogan (DD178), a military aircraft (S2F Tracker), and a sunken sailboat have also been identified offshore, south of the project area and west of the City of Imperial Beach. Submerged cultural resources thought to exist in the SSTC area are depicted in Figure 3.13-1.

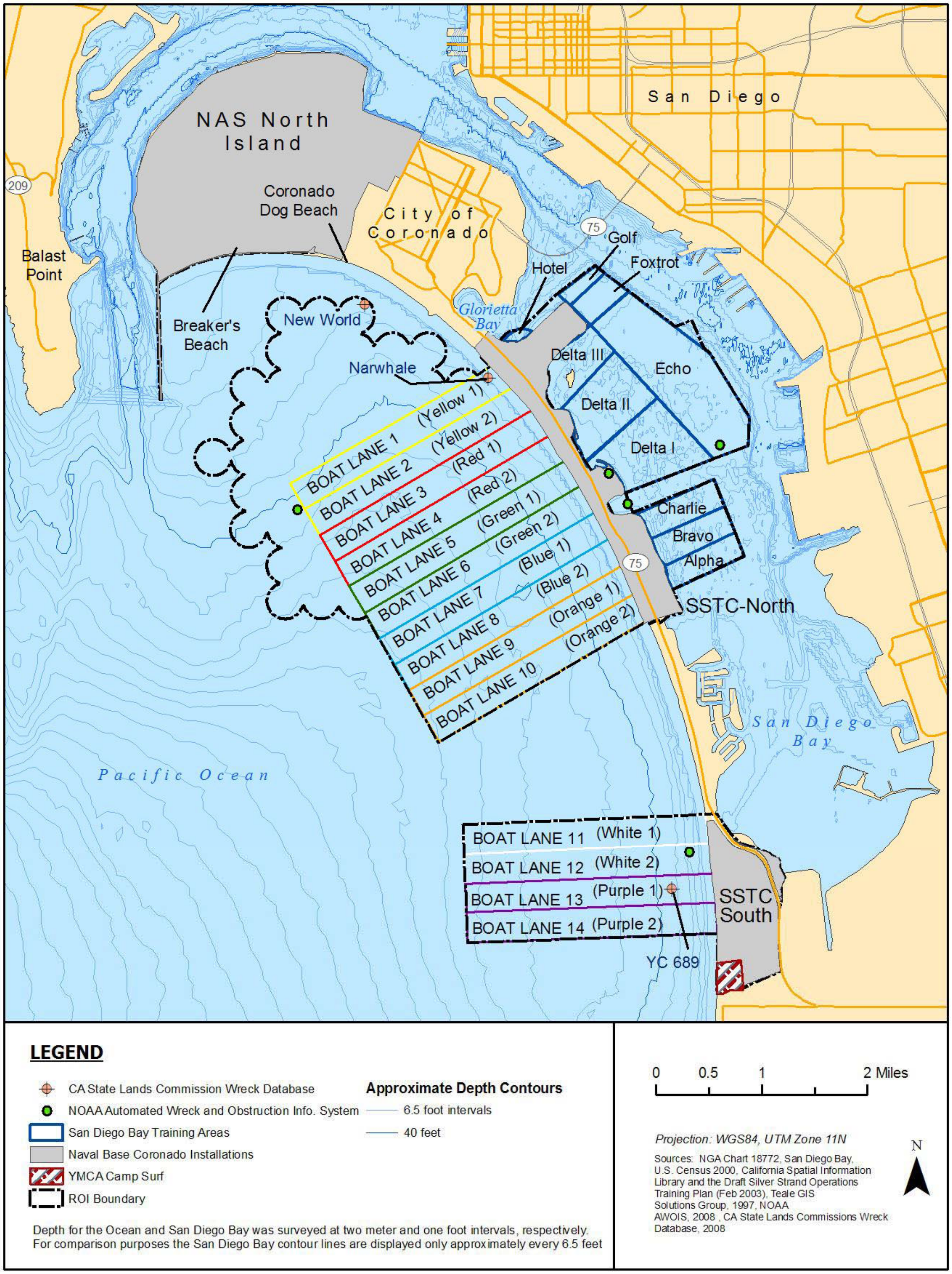


**Figure 3.13-1: Shipwrecks and Obstructions in the SSTC Area**

None of these potential historic properties have been properly recorded or evaluated for significance (i.e., eligibility for the National Register).

#### 3.13.1.6 Current Mitigation Measures

The Navy strives to ensure that it retains access to ocean training areas as necessary to accomplish its mission, while facilitating joint military-civilian use of such areas to the extent practicable and consistent with safety. These goals of military access, joint use, and safety are promoted through various coordination and outreach measures. The Navy currently employs management practices to avoid impacts to cultural resources:

- Restrict digging near any archaeological resource site that is known or assumed to be eligible for listing in the NRHP.
- Limit operational training access on or across the recorded areas of eligible or potentially eligible archaeological sites to foot traffic only.
- No alteration or damage to the appearance, structure, or features of NRHP-eligible built properties is permitted without appropriate Section 106 review and compliance.

Specifically, digging would be restricted (whether as a part of a training activity or infrastructure development) at site CA-SDI-5454/12,270, which is a site formally determined to be eligible for listing on the NRHP. This site contains prehistoric human remains and is thus subject to the provisions of the NAGPRA.

For the Single Anchor Leg Moor component of Offshore Petroleum Discharge System (Activity 38) the Navy procedure is to send down a diver to survey the bottom. This procedure avoids fouling of ground tackle and avoids impacts to submerged cultural resources. During other vessel activities, it is current practice that navigators avoid known obstructions and shipwrecks.

### 3.13.2 Environmental Consequences

This resource section focuses on groups of activities that could affect cultural resources. Similar types of activities are grouped together (agglomerated) for ease of analysis. Any substantial ground-disturbing activities could affect cultural resources if they took place in the immediate area of an archaeological site. These ground-disturbing activities consist of vehicular traffic, grading, pile-driving, anchoring, and intensive foot traffic associated with beach camps. Activities without the potential to result in substantial ground disturbance are numerous air, ground, surface, and mid-water column activities, including Activities 2-4, 6, 8, 13-15, 18, 20-24, 35, 49, 54, 55, 57, 65, 66, 70, 78, (Table 2-1) and N2 and N3 (Table 2-2). Navy training discourages casual collection of artifacts (i.e., secondary impacts) by participants to the extent that casual artifact collecting would be negligible. Other activities that do not have the potential to affect cultural resources are activities with dispersed or small-footprint foot traffic, or foot traffic on hard surfaces (Activities 16, 17, 19, 30, 36, 47, 58-63, 67, 72, and 73, Table 2-1). All other activities (Activities 1, 5, 7, 9-12, 25-29, 31-34, 37-46, 48, 50-53, 56, 64, 68-69, 71, 74-77, N1, N4-N9, N10, Tables 2-1 and 2-2) are analyzed with respect to possible cultural impacts.

#### 3.13.2.1 Approach to Analysis

Federal laws and regulations have established the requirements for identifying, evaluating, and mitigating impacts on cultural resources. Pertinent provisions of the NHPA, Archaeological Resources Protection Act (ARPA), and NAGPRA address management and treatment of cultural resources. Provisions of NHPA are addressed in more detail below. ARPA provides for site protection through penalties for non-compliance with its statutes and provides for authorizing archaeological investigations. NAGPRA contains requirements for repatriation of Native American human remains and associated funerary objects found on federal lands.

Under NHPA, resource significance is determined on the basis of NRHP criteria (36 CFR Part 60.4) in consultation with the CASHPO. A project affects a resource's significance when it alters the characteristics of the property that qualify it as significant under NRHP criteria. Effects may include:

- Physical destruction or damage to all or part of the resource;
- Alteration of a property in a way that is inconsistent with the Secretary's Standards for the Treatment of Historic Properties (36 CFR Part 68);
- Introduction of visual, atmospheric, or audible elements that alter the setting and diminish the integrity of the property's significant features;
- Neglect of a resource, resulting in its deterioration or destruction; and
- Any change that could adversely affect the qualities that make the property significant.

Under NHPA, assessing impacts involves identifying activities that could directly or indirectly affect significant resources, identifying known or expected significant resources in the area of potential effects, and determining the level of impacts on the resources. Possible findings include no effect, no adverse effect, or an adverse effect on significant resources (36 CFR Part 800.4-9).

Under the National Environmental Policy Act of 1969 (NEPA), impacts on cultural resources are explicitly identified as attributes that must be addressed to determine the significance of a project's anticipated environmental effects. The potential for adverse effects on cultural resources is considered in this NEPA assessment. An adverse effect on a historic property, however, does not necessarily equate to a significant impact under NEPA. Under NEPA, a significant impact can be mitigated to less than significant through data recovery or other treatment measures. In assessing impacts on cultural resources under NEPA, 40 CFR Part 1508.27 defines significance in terms of context and intensity. These elements include consideration of the impacts on the community, the importance of a site, the unique characteristics, and the severity of the impact.

Impacts on cultural resources can be either direct or indirect. Direct impacts on archaeological resources usually result from ground disturbance. Architectural resources may be directly impacted by modifications to the respective structure. Indirect impacts on significant cultural resources can involve alterations in its setting, increased access leading to vandalism, or changes in land status without adequate protection of the resources. Potential impacts to cultural resources relate to current and proposed activities that could affect the prehistoric and historic archaeological sites and historic structures on the SSTC. A range of potential impacts to cultural resources at SSTC have been identified and developed to exclude training activities from the immediate vicinity of significant cultural resources (Yatsko 2007). Cultural resources of concern at SSTC consist primarily of prehistoric archaeological sites located on the strand itself. These sites are small, encompassing up to a few acres. There are a few Historic Period archaeological sites and historic structures on the SSTC as well.

### 3.13.2.2 No Action Alternative

Both military and non-military entities have been sharing the use of the surface comprising the SSTC for more than 50 years. Military, commercial, and general activities have established an operational coexistence consistent with federal, state, and local plans and policies and compatible with each interest's varying objectives. Activities under the No Action Alternative include activities that are and have been routinely conducted in the area for decades.

#### 3.13.2.2.1 Inland Activities

Activities within the SSTC-S inland areas are categorized within the following Navy Tactical Tasks (NTAs): Conduct Amphibious Activities, Naval Special Warfare (NSW) Training, Construct, Maintain, and Operate Logistics Over-the-Shore, Mission Area Training, and Provide/Execute Training for U.S. and Other Nation Units and Individuals.

Activities which include vehicle and foot traffic, helicopter insertion, and digging (Activities 25-26, 28-29, 64, 74, 77, Table 2-1) could potentially result in damage to archaeological sites; however, the Navy restricts training activities to foot traffic only in the vicinity of NRHP site CA-SDI-5454/12,270, as well as in the vicinity of other eligible cultural resource sites. In an earlier Section 106 consultation with the CASHPO, the CRMP established Training Areas and Ranges (TARs) on San Clemente Island. In these, foot traffic was determined to constitute “no adverse effect” on cultural resources. The CRMP views the situation as analogous at SSTC and the San Clemente TARs precedent has been followed here. The CRMP provides management and oversight for conformance with the San Diego Metro Area PA at the SSTC under SAR, Categorical Exclusions, and other environmental review processes. In addition, the Navy uses a web-based scheduling tool that notifies operators of environmental issues prior to training. The avoidance measures described in Section 3.13.1.5 inform the training operators using the SSTC to avoid adversely affecting historic properties. Based on the established avoidance measures, no adverse effects to archaeological resources are expected.

Breacher Training (Activity 31, Table 2-1) is conducted at Bunker 98. All SSTC inland activities occur on Navy-owned lands which are inaccessible to civilians and the training area at Bunker 98 includes a buffer zone for safety and security. Breacher Training consists of entering a building or structure using manual force, compressed gas, torch, or shotguns. This involves temporary wooden or metal doors and frames constructed to simulate exterior and interior doors. Breaching occurs at Bunker 98 which is a National Register eligible resource. Training activities are directed at temporary doors and frames and the historic integrity of these heavy concrete bunkers is not compromised. During Breacher Training, small arm blanks may be discharged. When small arms live fire is conducted, the rounds are directed into traps. These activities have no impacts to the heavy concrete bunkers. Current management practices restrict Breacher Training activities from occurring near archaeological sites and the area immediately surrounding them at SSTC. Current activities are managed by NAVFAC SW for no adverse effect under Stipulation 8 of the Metro PA and in compliance with 36 CFR 800.5(d) (1).

#### 3.13.2.2.2 Oceanside/Bayside Activities

Oceanside/bayside activities consist of Move Forces, Mine Countermeasures, Conduct Amphibious Activities, NSW Training, Tactical Reconnaissance and Surveillance, Construct, Maintain, and Operate Logistics Over-the-Shore, Mission Area Training, Provide/Execute Training for U.S. and Other Nation Units and Individuals, Protect against Combat Area Hazards, and Force Protection: Protect and Secure Area of Operations.

The portions of SSTC used for these training events are the nearshore waters, surf zone, and wet and dry beach areas. Activities associated with each of these NTA categories involve large numbers of ground personnel and considerable foot and vehicular traffic on the oceanside and bayside training areas. Vehicle traffic can result in damage to archaeological sites, and foot traffic can cause secondary impacts (e.g., collection of artifacts). However, archaeological sites and their immediate surrounding areas are off-limits to vehicular training or ground-disturbing activities at SSTC. Underwater prehistoric cultural resources may be present in nearshore environments associated with the SSTC. However, no underwater prehistoric sites (cultural resources) have been identified which might be affected by naval landing craft, underwater detonations, or other vessels associated with training activities at SSTC or the nearshore waters off of southern NASNI.

Activities under Logistics Over-the-Shore require various landing crafts, amphibious vehicles, various wheeled and tracked vehicles, and ground personnel to complete each exercise (Activities 38, 39, 40, 41).

Effects from foot traffic and wheeled vehicles associated with logistics training are similar to those described above; the training activities are conducted away from cultural resource site areas at SSTC.

Other activities affecting the nearshore environment on the oceanside/bayside floor may cause bottom sediments to compact, bottom topography to be altered, and sediment to be stirred up (Activities 1, 5, 7, 9-12, 25-29, 32-34, 37-46, 48, 50-53, 56, 64, 68-69, 71, 74-77, Table 2-1). The effects from these activities, such as of pile driving, increases sediment transport, creates eddies, and accelerates longshore currents. The maneuvering and positioning of powered vessels and barges in shallow water to position equipment also stirs up bottom sediments. The activities described in this section do not have the potential to adversely affect cultural resources.

### 3.13.2.3 Alternative 1 (Preferred Alternative)

Under Alternative 1, the Navy would increase the tempo of training activities from 3,926 to 5,343, introduce new types of training activities, conduct existing training at additional locations within established SSTC training areas, and increase access to and availability of beach and inland training areas.

#### 3.13.2.3.1 Inland Activities

Under Alternative 1, Activities within the SSTC-S inland areas are categorized within the same NTAs as under the No Action Alternative. Additional training tempo for Alternative 1 would not create adverse effects because increased activity tempo will still avoid cultural resources identified on SSTC Inland areas.

New activities proposed under Alternative 1 within SSTC-S inland areas would also avoid identified cultural resources. Current management practices, which will continue to be implemented under Alternative 1, restrict vehicle or ground-disturbing activities near cultural resources and any increased pedestrian traffic associated with new activities will not represent an impact to cultural resources at SSTC.

Breacher Training would also occur on a concrete pad northwest of Bunker 99. As noted in Section 3.13.2.2.1 (No Action Alternative, Inland Activities), Breacher Training is managed by NAVFAC SW for no adverse effect under Stipulation 8 of the Metro PA and in compliance with 36 CFR 800.5(d)(1). Northwest of Bunker 99, a series of door frames would be placed on the existing concrete pad to facilitate mechanical breacher training. This breacher training area would be set 200 feet away from Building 99 and not adversely affect, either directly or indirectly, the Fort Emory Historic District. This would qualify for approval as a "no adverse effect," under Stipulation 8 of the CNRSW Metro Programmatic Agreement and consistent with 36 CFR 68, and 36 CFR 800.5.

#### 3.13.2.3.2 Oceanside/Bayside Activities

Under Alternative 1, Activities within the SSTC-S oceanside/bayside areas are categorized within the same NTAs as under the No Action Alternative. An increase in training tempo for Alternative 1 would not create adverse effects because training activities will still avoid all cultural resources identified on SSTC oceanside/bayside areas, Breakers Beach, or the waters off of NASNI.

Oceanside/bayside activities are managed by NAVFAC SW for no adverse effect under Stipulation 8 of the Metro PA and in compliance with 36 CFR 800.5(d) (1). The portions of SSTC used for these training events are the near-shore waters, surf zone, waters out to 72 feet, and wet and dry beach areas. No underwater prehistoric sites (cultural resources) have been identified which might be affected by naval landing craft activities or underwater detonations in nearshore areas. Similarly, Organic Airborne Mine Countermeasures activities involving the proposed (inert) minefield in deeper waters would occur in areas (SSTC boat lanes with water depths greater than 40 feet) with no known cultural resources.

Oceanside/bayside training involves new activities performed within the SSTC Boat and Beach Lanes (N1, N4-N9, N10, Table 2-2). Because of the avoidance of cultural resource sites during oceanside/bayside training activities, neither new training activities nor an increase in existing oceanside/bayside training activities would have the potential to adversely affect cultural resources.

#### 3.13.2.4 Alternative 2

Implementation of Alternative 2 is similar to Alternative 1 and would increase the training tempo from 3,926 activities to 5,343 activities annually. Implementation of Alternative 2 would also include the introduction of new types of training, conducting existing routine training at additional locations within SSTC established training areas, and increasing access to and availability of existing beach and inland training areas. The only difference between Alternative 1 and 2 is that, under Alternative 2, all SSTC-N oceanside beach training areas would be available for Navy training, regardless of time of year. Impacts associated with Alternative 2 would be the same as those described above for Alternative 1 for cultural resources. Under Alternative 2, the proposed change in availability and use of existing beach and inland training areas would not result in a modification of effects and activities would continue to be compatible with existing cultural resources.

### 3.13.3 Proposed Mitigation Measures

Current mitigation measures to avoid impacts to cultural resources will continue to be implemented under all alternatives. No impacts to cultural resources have been identified for the No Action Alternative, Alternative 1, or Alternative 2; therefore, no additional mitigation measures are warranted.

### 3.13.4 Unavoidable Adverse Environmental Effects

There are no unavoidable adverse environmental effects to cultural resources as a result of implementation of any alternatives.

### 3.13.5 Summary of Effects

The impacts to cultural resources by alternative are summarized in Table 3.13-4. No impacts to cultural resources have been identified under any of the three alternatives and no mitigation measures are required.

**Table 3.13-4: Summary of Effects**

| Alternative | Effects |
|---|---|
| **No Action Alternative** | • Vehicular activities and other ground disturbing activities are excluded from cultural resource sites and their immediate surrounding areas. Foot traffic does not constitute an adverse effect.<br>• Training activities may occur in areas with known submerged cultural resources; however, resources are avoided as necessary to prevent damage. |
| **Alternative 1** | • Vehicular activities and other ground disturbing activities are excluded from cultural resource sites and their immediate surrounding areas. Foot traffic does not constitute an adverse effect.<br>• Training activities may occur in areas with known submerged cultural resources; however, resources would be avoided as necessary to prevent damage. |
| **Alternative 2** | • The effects of Alternative 2 on cultural resources would be to the same as those described under Alternative 1. |
| **Mitigation Measures** | • The Navy currently employs the following management practices to avoid impacts to cultural resources: restricts digging near any cultural resource site that is known to be eligible for listing in the NRHP, limits operational training access on or across the recorded areas of eligible or potentially eligible archaeological sites to foot traffic only, and no alteration or damage to the appearance, structure, or features of NRHP-eligible built properties is permitted without appropriate Section 106 review and compliance. |

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# 3.14 Transportation and Circulation

## 3.14 TRANSPORTATION AND CIRCULATION

This section addresses potential impacts of the alternatives, including the Proposed Action, on transportation and circulation in the vicinity of the Silver Strand Training Complex (SSTC) and the southern beaches and nearshore waters of Naval Air Station North Island (NASNI), focusing on vehicular traffic and recreational boating.

### 3.14.1 Affected Environment

### 3.14.1.1 Introduction

#### 3.14.1.1.1 Definition

In this section, transportation and circulation refer to the movement of vehicles on public roadways and vessels on the ocean and bay.

### Vehicle Traffic

Road and highway networks consist of primary roads and secondary roads. Primary roads are principal arterials, such as interstate freeways and state highways, designed to move vehicle traffic. Primary roads provide limited access to adjacent areas. Secondary roads are arterials such as major surface streets that provide access to residential, commercial, and recreational areas; public service facilities such as hospitals and schools; government facilities, and other commonly accessed infrastructure. Secondary roads also collect traffic from common areas and transfer it to primary roads.

Roadway operating conditions and the adequacy of the existing and future roadway system to accommodate vehicular movements are described in terms of Level of Service (LOS). Table 3.14-1 shows the United States (U.S.) Department of Transportation's standard LOS—a set of letter designations, ranging from A through F, which describes the range of operating conditions on a particular type of roadway facility. LOS A and LOS B indicate free-flow travel and minimal-delay travel, while LOS C indicates acceptable delays. LOS D indicates the beginning of traffic congestion with tolerable delays, while LOS E and LOS F indicate significant and excessive congested conditions. The region-wide goal for an acceptable LOS on all urban freeways, roadway segments, and intersections is LOS D. For undeveloped or not densely developed locations, the goal may be to achieve LOS C (San Diego Traffic Engineers Council [SANTEC]/Institute of Traffic Engineers [ITE] 2007).

**Table 3.14-1: Level of Service Descriptions**

| LOS | Signalized Delay (seconds/vehicle) | Unsignalized Delay (seconds/vehicle) | Description |
|---|---|---|---|
| A | ≤10 | ≤10 | Free-Flowing |
| B | >10 and ≤20 | >10 and ≤15 | Minimal Delays |
| C | >20 and ≤35 | >15 and ≤25 | Acceptable Delays |
| D | >35 and ≤55 | >25 and ≤35 | Tolerable Delays |
| E | >55 and ≤80 | >35 and ≤50 | Significant Delays |
| F | >80 | >50 | Excessive Delays |

Source: Highway Capacity Manual, Transportation Research Board of the Academies, 2000.

### Vessel Traffic

Ocean and San Diego Bay traffic consists of the transit of commercial, private, or military vessels. The ocean traffic flow in congested waters, especially near coastlines, is controlled by the use of directional shipping lanes for large vessels, including cargo, container ships, and tankers. Traffic flow controls are implemented to ensure that harbors and ports-of-entry remain as uncongested as possible. There is less control on open-ocean traffic involving recreational boating, sport fishing, commercial fishing, and activity by naval vessels. In most cases, the factors that govern shipping or boating traffic include the following: adequate depth of water, weather conditions—primarily affecting recreational vessels—availability of fish, and water temperature. Warmer weather and warm water temperatures will increase recreational boat traffic, jet skis, and diving activities.

#### 3.14.1.1.2 Regional Setting

The principal regional access to SSTC is via Interstate 5 (I-5), which is located east of San Diego Bay and is a major north-south route in the federal highway system. Access to and from SSTC from the north is from I-5 via State Route 75 (SR-75), which includes the San Diego–Coronado Bridge, and the following streets in Coronado: 3rd Street (westbound), 4th Street (eastbound), Orange Avenue, and Silver Strand Boulevard/SR-75. Access to and from SSTC from the south is from I-5, via SR-75 (noted as Palm Avenue in Imperial Beach). SR-75 runs through SSTC-North (SSTC-N) and SSTC-South (SSTC-S) (Figure 3.14-1).

Marine traffic in the SSTC Region of Influence (ROI) consists of multiple marinas, mooring locations, and military installations. San Diego Bay is bordered by the cities of San Diego, National City, Chula Vista, Imperial Beach, and Coronado. Access to San Diego Bay by incoming vessels is through the mouth of the harbor to the north, or through the many marinas and boat launch locations within San Diego Bay. The Port of San Diego manages the harbor and administers the public lands adjacent to San Diego Bay.

#### 3.14.1.1.3 Region of Influence

The ROI for the traffic and circulation analysis includes the road networks on SSTC and the neighboring communities of the City of Coronado and City of Imperial Beach. For marine vessel traffic, the ROI includes San Diego Bay and the offshore area at SSTC-N, and SSTC-S. Naval Air Station North Island is not discussed because current and proposed training activities would only occur on the southern beaches of NASNI and these training activities have minimal effect on transportation and circulation outside of the base boundaries. Except where specific city standards are described, the standards used for traffic description are taken from *SANTEC/ITE Guidelines for Traffic Impact Studies in the San Diego Region* (SANTEC/ITE 2007). The analysis focuses on segments of the transportation network that serve as direct or indirect links to SSTC.

### 3.14.1.2 Key Regional Roadways

#### 3.14.1.2.1 Silver Strand Boulevard/State Route 75

The main roadway link to the cities of Coronado and Imperial Beach is via SR-75, which connects the City of Coronado at the east end of the peninsula to the City of San Diego via the San Diego-Coronado Bridge and also connects the city at the south end of the Silver Strand to the City of Imperial Beach. SR-75 travels along the entire length of the Silver Strand through SSTC-N and SSTC-S with access points into Naval Amphibious Base (NAB) Coronado. South of Pomona Avenue, SR-75 is referred to as Silver Strand Boulevard/SR-75. Silver Strand Boulevard/SR-75 is a two-way, four-lane principal arterial roadway with left-turn lanes at signalized intersections and a posted speed limit of 45 miles-per-hour south of Avenida Del Sol and 65 miles-per-hour south of Tulagi Road. According to the SANTEC guidelines, the roadway capacity for SR-75 is 40,000 average daily trips (ADT) from Pomona Avenue (just north of Glorietta Bay) to the city limits of Imperial Beach.

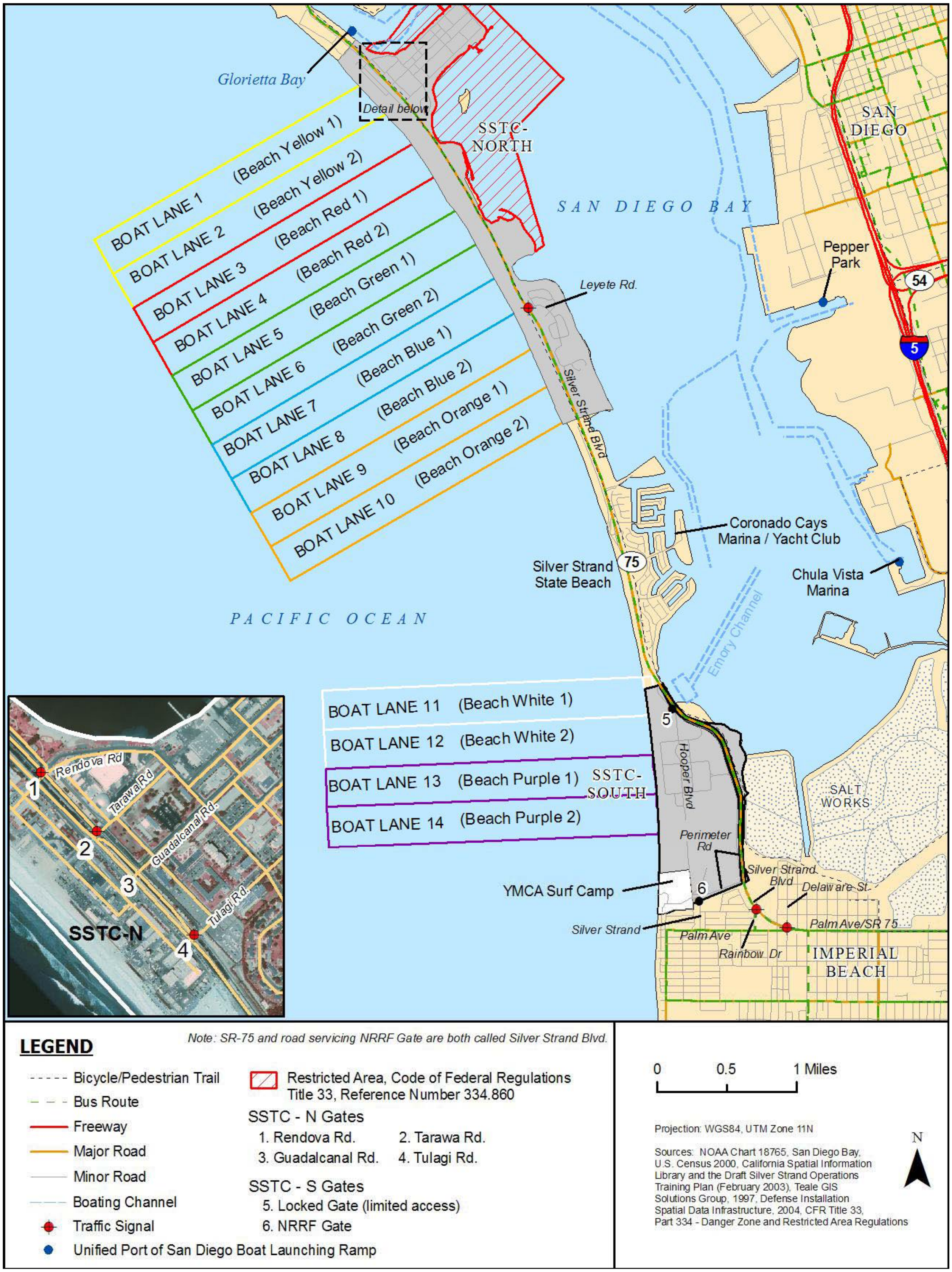


**Figure 3.14-1: Transportation and Circulation of SSTC**

As shown in Table 3.14-2, the ADT for weekday 24-hour traffic volume on SR-75 was 39,053 vehicles between Pomona Avenue and Tarawa Road (Gate 2 of SSTC-N) (Department of the Navy [DoN] 2008). The ADT for weekday 24-hour traffic volume on SR-75 was 25,566 vehicles between Tarawa Road and Tulagi Road (Gate 4 of SSTC-N) and 30,327 vehicles between Tulagi Road and Leyte Road (DoN 2008). These baseline ADT numbers have been selected assuming all three CVN (Nuclear Powered Aircraft Carrier) are in port together. Between Coronado Cays Boulevard/Silver Strand State Park and Rainbow Drive in Imperial Beach (i.e., through SSTC-S), the ADT was 22,000 vehicles which amounted to a decrease of two percent in ADT (SANDAG 2008).

**Table 3.14-2: Average Traffic Volumes at Selected Coronado Road Segments**

| Primary Street | First Cross Street | Second Cross Street | Average Daily Traffic (ADT) Counts |
|---|---|---|---|
| Silver Strand Blvd / (SR-75) | Pomona Ave. | Tarawa Rd. | 39,053[1] |
| Silver Strand Blvd / (SR-75) | Tarawa Rd. | Tulagi Rd. | 25,566[1] |
| Silver Strand Blvd / (SR-75) | Tulagi Rd. | Leyte Rd. | 30,327[1] |
| Silver Strand Blvd / (SR-75) | Coronado Cays Blvd. | Rainbow Dr. | 22,000[2] |

[1] DoN 2008: ADTs based on 3 CVNs

[2]SANDAG 2008:ADTs for Coronado Cays Blvd. to Rainbow Dr. is based on 2006 data.

Table 3-14-3 provides peak hour intersection volumes at the Avenida De Las Arenas intersection and the three signalized NAB access gates along Silver Strand Boulevard/SR-75. Peak hour traffic counts were conducted from 5:30 AM to 7:30 AM and from 2:30 PM to 5:00 PM.

**Table 3.14-3: Peak Hour Intersection Volumes, Delays, and LOS for Selected Intersections along Silver Strand Boulevard/SR-75**

| Intersection | AM Peak Hour Intersection Volumes | Existing AM | | PM Peak Hour Intersection Volumes | Existing PM | |
|---|---|---|---|---|---|---|
| | | Delay in Seconds | LOS | | Delay in Seconds | LOS |
| Silver Strand & Avenida De Las Arenas | 2,867 | 7.6 | A | 3,252 | 12.3 | B |
| Silver Strand & Rendova Road (Gate 1) | 3,328 | 75.0 | E | 3,260 | 12.8 | B |
| Silver Strand & Tarawa (Gate 2) | 3,284 | ECL[1] | F | 3,406 | 82.5 | F |
| Silver Strand & Tulagi (Gate 4) | 2,683 | 4.2 | A | 2,612 | 2,612 | B |

[1] Exceeds Calculated Limit (ECL), reported when delay exceeds 180 seconds.

Source: City of Coronado City-Wide Major Traffic Study 2005. Data Collected July 2003 through August 2003. DoN 2008.

LOS for specific segments on SR-75 are shown in Table 3.14-3. SR-75 between Pomona Avenue and Avenida De Las Arenas operate at LOS A (City of Coronado 2005). There are three intersections on SR-

75 that provide access gates to NAB. The highest traffic volumes are found at Rendova Road (Gate 1) and Tarawa Road (Gate 2). The Rendova Road (Gate 1) intersection operates at LOS E during the busiest morning commute hour and Tarawa Road (Gate 2) intersection operates at LOS F during the busiest morning and afternoon commute hours (City of Coronado 2005). All other intersections surrounding NAB operate at an acceptable LOS.

The City of Coronado is currently in the process of analyzing traffic conditions for SR-75, to determine the best long-term traffic solution for the community. Intersections operating at a LOS F have reached maximum effective operating capacity. Any additional trips added without maintaining the existing operating capacity would further degrade the operational function and does not allow an intersection or segment to continue to operate within its capacity, as the segment or intersection has failed. The City plans to evaluate final design plans for a selected preferred traffic alternative. A significant part of this process will include working closely with project stakeholders, such as the Navy (Coronado Currents 2007).

#### 3.14.1.2.2 Palm Avenue

The City of Imperial Beach is in the process of preparing a Master Plan for the redevelopment of Palm Avenue. Palm Avenue merges with SR-75 at Delaware Street in the City of Imperial Beach. Palm Avenue is a three-lane collector street from Seacoast Drive to 3$^{rd}$ Street and a four-lane collector street from 3$^{rd}$ Street to Palm Avenue/SR-75. Access to SSTC-S for military personnel traveling from NAB is by Silver Strand Boulevard/SR-75 to Rainbow Drive and then to Palm Avenue (Figure 3.14-1). From Palm Avenue, access to the Naval Radio Receiving Facility (NRRF) Gate is provided via a two-lane residential roadway. Traffic volumes along Palm Avenue between 2005 and 2006 have decreased by about 12 percent (Table 3.14-4). The roadway capacity for Palm Avenue (operating at LOS E) is 34,200 ADTs from SR-75 to Seacoast Drive (County of San Diego 1999).

**Table 3.14-4: Average Traffic Volumes at Selected Imperial Beach Road Segments**

| Primary Street | First Cross Street | Second Cross Street | Average Daily Traffic Counts (Weekdays) | | | |
|---|---|---|---|---|---|---|
| | | | 2004 | 2005 | 2006 | 2005-2006 Change |
| Palm Avenue | Seacoast Drive | Delaware Street/SR 75 | 19,000 | 20,900 | 12,600 | -40% |
| Rainbow Drive | Silver Strand Blvd/SR 75 | Palm Avenue | 5,000 | 5,000 | 5,200 | 4% |

Source: SANDAG 2008.

#### 3.14.1.2.3 Rainbow Drive

Rainbow Drive is a three-lane collector roadway. Typical roadway capacity for a three-lane collector is 27,400 operating at a LOS C (County of San Diego 1999). Traffic volumes along Rainbow Drive from Silver Strand Boulevard to Palm Avenue between 2005 and 2006 have only increased by four percent, from 5,000 to 5,200 ADTs (Table 3.14-4).

#### 3.14.1.2.4 Silver Strand

Silver Strand is a two-lane residential roadway servicing the entrance to SSTC-S. It is the main access point for Navy personnel onto SSTC-S. There are no ADTs available for Silver Strand between Palm Avenue and the entrance into SSTC-S. However, based on the County of San Diego Public Road Standards, typical roadway capacity for a residential street operating at a LOS C is 1,500 (County of San Diego 1999).

### 3.14.1.3 Installation Roadways and Gates

#### 3.14.1.3.1 SSTC-N

There are four access gates to the bayside facilities of SSTC-N. As shown in Figure 3.14-1, SR-75 is signalized at Gates 1, 2, and 4. Gate 1 at Rendova Road is the most northerly access and is a secondary access point open during the morning and afternoon peak hours, or when necessary to permit the crossing of the boat movers and other Navy support vehicles. Gate 1 has a direct connection to SR-75 with all turning movements permitted; it accommodates one lane of traffic in each direction.

Gate 2 at Tarawa Road is a secondary access point that is open during the morning and afternoon peak hours as needed. It has a direct connection to SR-75 with all turning movements permitted; it accommodates one lane of traffic in each direction.

Gate 3 at Guadalcanal Road is the main entrance and the most heavily used gate; it is open 24 hours a day. Access to Gate 3 is via Strand Way, a frontage road for traffic signals near Gates 2 and 4. Strand Way serves as a queuing area off SR-75 for vehicles awaiting SSTC clearance and experiences backups that have a negative effect on the peak morning traffic on Silver Strand Boulevard/SR-75, specifically at the intersection; it accommodates one lane of traffic in each direction.

Gate 4 at Tulagi Road is the most southerly access point and is a secondary access point that is open during morning and afternoon peak hours; it has a direct connection to SR-75 and turning movements are permitted except the southbound left-turn.

Immediate access to oceanside facilities at SSTC-N is via two gates that are located opposite of Gates 1 and 2 on the bayside. Access is available to both gates via Strand Way, which serves as a queuing area for vehicles awaiting clearance. It accommodates one lane of traffic in each direction; backups occur during peak hours on Strand Way, resulting in congestion at intersections on Silver Strand Boulevard/SR-75. Both gates have traffic signals at SR-75, with all turning movements permitted, except the northbound left-turn at the northerly gate. The southerly gate (opposite Gate 2) is the primary entrance and the northerly gate is the secondary entrance. Both gates can accommodate one lane of traffic in each direction.

Access to the oceanside training beaches at SSTC-N is provided either from SR-75 or the Main Base oceanside. An unpaved roadway parallel to SR-75 runs along the beach and provides a vehicular connection to the training beaches; this roadway connects with SR-75 near the SSTC marina.

#### 3.14.1.3.2 SSTC-S

Access to SSTC-S for everyday ingress/egress is provided via the NRRF gate at Silver Strand (Figure 3.14-1). A second access gate, normally kept locked, is located to the north bordering Silver Strand Boulevard/SR-75. Hooper Boulevard begins at the NRRF main entrance and continues through the middle of the facility. Camp Surf is accessible both directly from Carnation Avenue and via a guarded, locked gate that intersects Hooper Boulevard. An overlook parking area is provided off SR-75 for pedestrian access to view the wildlife preserve to the north of the NRRF facility.

### 3.14.1.4 On-base Roadways

#### 3.14.1.4.1 SSTC-N

SSTC-N contains about 6.5 miles of paved roads on the bayside, most of which are in fair condition. Traffic circulation through the base is on a series of disjointed grid-system roads. Tarawa Road, Attu Road, Guadalcanal Road, Bougainville Road, and Tulagi Road are the main east/west streets. Guadalcanal Road and Tulagi Road are the most heavily used. The north/south roadways are less prominent than the east/west roadways. Only Lavella Road, Rendova Road, and Inchon Road are continuous between Tarawa Road and Tulagi Road. Trucks are routed through the base on Guadalcanal Road to Makin Road to Attu Road. Truck traffic represents about five percent of the total traffic through the base.

#### 3.14.1.4.2 SSTC-S

Traffic circulation on SSTC-S consists of two major roads: Hooper Boulevard and an unnamed perimeter road. Hooper Boulevard leads from the main entrance through the middle of the facility. A perimeter road begins at the main gate and follows the southern and eastern perimeter of the base then turns west and provides the main access to the buildings on the northern section of SSTC-S. The perimeter road also connects with SR-75 at the northern boundary of SSTC-S. The oceanside training beaches are accessed via roads connecting to Hooper Boulevard.

### 3.14.1.5 Marine Vessels

San Diego Bay is under the jurisdiction of the Port of San Diego and the San Diego Harbor Police. Marine traffic in San Diego Bay is generated by commercial, recreational, military, and commuter vessels. Sport fishing fleets and whale-watching tour boats access San Diego Bay daily and berth along the Bay’s east side.

Military traffic includes vessel activity from the Naval Station San Diego, NAB piers, NASNI pier-side carrier locations and berthing, and Naval Base Point Loma submarine base at the mouth of the harbor.

To the north of the Coronado Bridge, vessels must follow U.S. Coast Guard (USCG) regulations and general maritime restrictions while traversing San Diego Bay. The circulation of San Diego Bay is from the harbor berthing areas, along channel buoy markers, and out to the mouth of the channel. To the south of the Coronado Bridge, large vessels remain within the state channels on the east side of San Diego Bay to accommodate deep draft, and recreational vehicles may traverse east and west or north or south depending on the draft of their vessel.

Commuter and general transportation by water taxi and Coronado passenger/bike ferry is also used by many people on San Diego Bay. Recreational boating traffic is generated through various boat ramps, marinas, and moorings around San Diego Bay.

There are four Port District-maintained launch ramps throughout San Diego Bay. Three of these are within the ROI. These are National City—Pepper Park, adjacent to the 24th Street Marine Terminal; Chula Vista—in the J Street Park; and Coronado—adjacent to the Municipal Pool in Glorietta Bay (Figure 3.14-1).

### 3.14.1.6 Current Mitigation Measures

The Navy strives to ensure that it retains access to oceanside and bayside training areas as necessary to accomplish its mission, while facilitating joint military-civilian use of such areas to the extent practicable and consistent with safety. These goals of military access, joint use, and safety are promoted through various coordination and outreach measures, including publication of potentially hazardous activities planned for the oceanside and bayside areas through Notices to Mariners (NOTMARs) issued by the USCG.

## 3.14.2 Environmental Consequences

This resource section focuses on groups of activities that would generate an increase in vehicle trips associated with military training activities. Training activities that would not affect transportation and circulation on local roadways include 1-3, 8-14, 16, 21, 24, 32-34, 55, 57, 78 (Table 2-1), and N1, N4-N7

(Table 2-2); however, these activities are analyzed as they relate to vessel traffic within the ocean and San Diego Bay area. All other activities are analyzed for their effects on both roadways and vessel traffic. Since no increase in employment is associated with implementation of the Proposed Action, this section focuses on increased traffic related to the proposed increase in training tempo. In addition, since traffic generated by military personnel is accommodated on local and regional roadways in the area, no further discussion of military personnel-generated trips is provided in this section.

### 3.14.2.1 Approach to Analysis

This analysis focuses on the potential effects of traffic loading on SSTC and the surrounding roadway network system, as well as potential effects to marine traffic within the ocean area off of SSTC and San Diego Bay. Factors considered in assessing potential roadway impacts include the extent and degree in which implementation of the Proposed Action would result in traffic increases exceeding the design capacity of an affected portion of the roadway system; and impacts to marine traffic that would include the extent or degree to which an alternative would seriously disrupt commercial and recreational vessels. A serious disruption to vehicular traffic occurs when the LOS of an area increases to unacceptable levels of an LOS of D or higher. A serious disruption to marine traffic occurs when a vessel in unable to proceed to its intended destination due to exclusion from the area. However, the need to use alternative routes during the time of exclusion does not constitute a serious disruption. Navy personnel transiting roadways at intersections do so upon appropriate traffic cycles and do not disrupt roadway traffic.

### 3.14.2.2 No Action Alternative

#### 3.14.2.2.1 Ground Transportation

Under the No Action Alternative, military training activities along Silver Strand Boulevard/SR-75 are estimated to generate approximately 217 ADTs. These ADTs consist of military personnel driving training vehicles from NAB to SSTC-N and SSTC-S. Based on transportation data from the U.S. Navy CVN Homeporting Final Supplemental Environmental Impact Statement (DoN 2008) and SANDAG transportation data, in 2006, ADTs along Silver Strand Boulevard/SR-75 ranged between 22,000 and 39,053 along selected road segments (Table 3.14-2). Therefore, traffic generated by military training activities along the stretch of Silver Strand Boulevard/SR-75 from Pomona Avenue to Rainbow Drive under the No Action Alternative would represent less than one percent of the total daily traffic volume; these volumes are well within the existing roadway capacities.

As presented in Table 3.14-3, there are two intersections that are currently operating at an unacceptable LOS (LOS of D or worse). These intersections are Silver Strand Boulevard/SR-75 and Rendova Road, operating at a LOS E during peak morning hours and Silver Strand Boulevard/SR-75 and Tarawa Road, operating at a LOS F during peak morning and evening hours. Under the No Action Alternative, about eight percent of the estimated 217 total vehicle trips associated with military training activities would occur during peak morning hours and about 19 percent would occur during peak evening hours. Therefore, under the No Action Alternative, about 17 peak morning-hour vehicle trips and about 41 peak evening-hour vehicle trips would be associated with military training activities. Based on the total peak hour intersection volumes along Silver Strand Boulevard/SR-75 (Table 3.14-3), peak hour (both before noon and after noon) vehicle trips associated with military training activities under the No Action Alternative would represent less then one percent of the total vehicle trips at these intersections. Therefore, the No Action Alternative would not substantially change the existing morning and evening peak hour LOS at the intersections of Silver Strand Boulevard/SR-75 and Rendova Road or Silver Strand Boulevard/SR-75 and Tarawa Road. In addition, all other intersections as presented in Table 3.14-3 would continue to operate at the current LOS.

Of the 217 vehicles traveling along Silver Strand Boulevard/SR-75, it is estimated that about 147 of those vehicles would be traveling to SSTC-S to conduct training activities. As shown in Table 3.14-4, average traffic volumes along Palm Avenue and Rainbow Drive (within Imperial Beach) are 12,600 and 5,200, respectively. Therefore, traffic generated by military training activities would represent about one percent of the traffic volume along Palm Avenue and about three percent along Rainbow Drive. These traffic volumes would be well within the existing roadway capacities and would not result in a change to an unacceptable LOS along Palm Avenue or Rainbow Drive.

Traffic volumes were not available for the two-lane residential roadway from Palm Avenue that provides access into SSTC-S. However, the typical roadway capacity for a residential street operating at a LOS C according to the County of San Diego Public Road Standards is 1,500. Military vehicular traffic would represent almost 10 percent of the traffic volume along Palm Avenue; this increase would not result in an unacceptable LOS for roadways near the NRRF gate.

#### 3.14.2.2.2 Vessel Transportation

Both military and nonmilitary entities have been sharing use of the ocean for more than 50 years. Activities under the No Action Alternative are and have been routinely conducted in the area for decades. Local NOTMARs are issued through the USCG 11th District on an as-needed basis for underwater detonations only. Ocean training areas on SSTC-N oceanside are infrequently closed and accessed on an as-needed basis for security and safety.

Naval bayside activities are centered within nine bayside training areas (Alpha, Bravo, Delta I, Delta II, Delta III, Echo, Foxtrot, Golf, and Hotel) and include the Lilly Ann Drop Zone (DZ). These areas are not within state channels. A restricted zone surrounds NAB bayside and surrounding waters to the south (Code of Federal Regulations 33 § 334.860) (Figure 3.14-1) (refer to Section 3.16, Public Health and Safety). For safety purposes, all vehicles entering the restricted area must proceed across the area by the most direct route and without unnecessary delay. For vessels under sail, necessary tacking shall constitute a direct route. USCG Inland Rules apply within San Diego Bay (USCG 2007); mariners following general inland regulations are not affected by Navy training activities and vessels are not prevented from getting to their desired locations.

### 3.14.2.3 Alternative 1 (Preferred Alternative)

Implementation of Alternative 1 would increase the training tempo from 3,926 activities to 5,343 activities annually. Implementation of Alternative 1 would also include the introduction of new types of training, conducting existing routine training at additional locations within SSTC established training areas, and increasing access to and availability of existing beach and inland training areas.

#### 3.14.2.3.1 Ground Transportation

Under Alternative 1, military training activities along Silver Strand Boulevard/SR-75 are estimated to generate approximately 336 ADTs, an increase of about 119 vehicle trips per day from the No Action Alternative. While the proposed increase in training would result in an increase in military training vehicle trips per day along the stretch of Silver Strand Boulevard/SR-75 from Pomona Avenue to Rainbow Drive, this increase would represent less than two percent of the total daily traffic volume and increases would continue to be well within the existing roadway capacities.

As previously discussed, there are two intersections that are currently operating at an unacceptable LOS (LOS of D or worse). These intersections are Silver Strand Boulevard/SR-75 and Rendova Road, operating at a LOS E during peak morning hours and Silver Strand Boulevard/SR-75 and Tarawa Road, operating at a LOS F during peak morning and evening hours (Table 3.14-3). Under Alternative 1, about eight percent of the estimated 336 total vehicle trips associated with military training activities occurs during peak morning hours and about 19 percent occur during peak evening hours. Therefore, under Alternative 1, about 27 peak morning hour vehicle trips and about 64 peak evening hour vehicle trips would occur at these two intersections. Based on the total peak hour intersection volumes along Silver Strand Boulevard/SR-75 (Table 3.14-3), peak hour vehicle trips associated with military training activities at these two intersections under Alternative 1 would represent less than one percent of the total morning peak hour vehicle trips and less than two percent of the total evening peak hour vehicle trips. Therefore, implementation of Alternative 1 would not substantially change the existing morning and evening peak hour LOS at the intersections of Silver Strand Boulevard/SR-75 and Rendova Road or Silver Strand Boulevard/SR-75 and Tarawa Road. In addition, all other intersections as presented in Table 3.14-3 would continue to operate at the current LOS.

Of the 336 vehicles traveling along Silver Strand Boulevard/SR-75, it is estimated that about 249 of those vehicles would be traveling to SSTC-S to conduct training activities. Therefore, traffic generated by military training activities under Alternative 1 represents about two percent of the traffic volume along Palm Avenue and about four percent along Rainbow Drive. These traffic volumes are well within the existing roadway capacities and would not result in a change to an unacceptable LOS along Palm Avenue or Rainbow Drive.

As previously discussed, traffic volumes were not available for Silver Strand, the roadway that provides access into SSTC-S; however, based on the County of San Diego Public Road Standards, typical roadway capacity for a residential street operating at a LOS C is 1,500. Therefore, the increase in training tempo associated with implementation of Alternative 1 would represent approximately 7 percent of the traffic volume along Silver Strand. This increase would not result in a change to an unacceptable LOS along Silver Strand.

#### 3.14.2.3.2 Vessel Transportation

As described under the No Action Alternative, NOTMARs would continue to be issued by the USCG. Ocean training areas on SSTC-N oceanside would be closed on an as needed basis for security and safety. Breakers Beach and the Zuniga Jetty training area would continue to be restricted from civilian activity. Navy interference with non-participant marine traffic would not be likely because Navy training activities are restricted to a 500-yard boat lane during exercises. Vessels would not be prevented from getting to their desired locations.

Naval bayside activities are centered within nine bayside training areas (Alpha, Bravo, Delta I, Delta II, Delta III, Echo, Foxtrot, Golf, and Hotel) and include the Lilly Ann DZ. These areas are not within state channels and are restricted from civilian use while training activities are being conducted. Navy security would continue to ensure that all marine traffic is diverted when training activities are being conducted for safety reasons. USCG Inland Rules apply within San Diego Bay. Increased Navy activities would not have an effect on San Diego Bay’s circulation interests because public activities are centered on local marinas and anchorages to the south of the activity areas. Therefore, no conflict would occur with vessels as a result of conducting training activities.

### 3.14.2.4 Alternative 2

Implementation of Alternative 2 would increase the training tempo from 3,926 activities to 5,343 activities annually. Implementation of Alternative 2 would also include the introduction of new types of training, conducting existing routine training at additional locations within SSTC established training areas, and increasing access to and availability of existing beach and inland training areas. The only difference between Alternative 1 and 2 is that, under Alternative 2, all SSTC-N oceanside beach training areas would be available for Navy training, regardless of time of year. Therefore, transportation and circulation effects associated with Alternative 2 would be the same as those described above for Alternative 1. Under Alternative 2, the proposed change in access and availability to existing beach and inland training areas would not result in a change in the number of training vehicles or traffic patterns.

### 3.14.3 Proposed Mitigation Measures

No adverse effects on transportation and circulation were identified; therefore, no additional mitigation measures are warranted. Current measures, which facilitate joint military-civilian use of SSTC consistent with safety, would continue.

### 3.14.4 Unavoidable Adverse Environmental Effects

There are no unavoidable adverse environmental effects to transportation and circulation as a result of implementation of any of the alternatives.

### 3.14.5 Summary of Effects

Table 3.14-5 summarizes possible effects and mitigation measures for the No Action Alternative, Alternative 1, and Alternative 2.

**Table 3.14-5: Summary of Transportation and Circulation Effects**

| Alternative | Summary of Effects |
|---|---|
| **No Action Alternative** | • Intersections and roadways within the ROI typically experience an acceptable LOS. Although the intersections at Gates 1 and 2 experience unacceptable LOS, traffic related to the No Action Alternative represents less than 1% of the volume at these intersections.<br>• Marine traffic is diverted from training areas while some training is being conducted; however, vessels are not prevented from getting to their desired locations. |
| **Alternative 1** | • Increases in military training vehicle trips per day would represent less than 2% of the total daily traffic and would be well within the capacities of the existing regional roadway network.<br>• Intersections and roadways within the ROI typically experience an acceptable LOS. Although the intersections at Gates 1 and 2 experience unacceptable LOS, traffic related to Alternative 1 represents less than 1% of the morning volume and less than 2% of the evening traffic at these intersections.<br>• Marine traffic is diverted from training areas while some training is being conducted; however, vessels are not prevented from getting to their desired locations. |
| **Alternative 2** | • Potential effects on transportation and circulation from Alternative 2 would be the same as effects from implementation of Alternative 1. |
| **Mitigation Measures** | • The Navy strives to ensure that it retains access to oceanside and bayside training areas as necessary to accomplish its mission, while facilitating joint military-civilian use of such areas to the extent practicable and consistent with safety. These goals of military access, joint use, and safety are promoted through various coordination and outreach measures, including publication of potentially hazardous activities planned for the oceanside and bayside areas through NOTMARs issued by the USCG. |

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# 3.15 Socioeconomics, Environmental Justice, and Protection of Children

# 3.15 SOCIOECONOMICS, ENVIRONMENTAL JUSTICE, AND PROTECTION OF CHILDREN

## 3.15.1 Affected Environment

### 3.15.1.1 Introduction

This section evaluates effects related to socioeconomics, environmental justice (as required under Executive Order (EO) 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations), and protection of children (as required under EO 13045, Protection of Children From Environmental Health Risks and Safety Risks).

### 3.15.1.2 Definition

Socioeconomics includes an evaluation of the basic attributes and resources associated with the human environment, particularly population, and economic activity. Economic activity encompasses employment, personal income, and industrial growth. Impacts on these fundamental socioeconomic components influence other issues such as housing availability and provision of public services.

### 3.15.1.3 Federal Requirements

EO 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Population*, provides that "each Federal agency shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations." The Council on Environmental Quality (CEQ) Guidance on Environmental Justice of 10 December 1997 provides direction on type of information generally used, provide a finding on whether the proposed action has adverse human health effects on the minority populations, low-income populations, or Indian tribes, and provide a second finding on whether the proposed action has other adverse environmental effects on impact the minority populations, low-income populations, and Indian tribes.[1]

Section 1-101 of Executive Order 12898 provides specific guidance to federal agencies for determining whether or not disproportionately high and adverse human health or environmental effects are caused by programs, policies, and activities. The guidance includes:

"When determining whether human health effects are disproportionately high and adverse, agencies are to consider the following three factors to the extent practicable:

(a) Whether the health effects, which may be measured in risks and rates, are significant (as employed by NEPA), or above generally accepted norms. Adverse health effects may include bodily impairment, infirmity, illness, or death; and

(b) Whether the risk or rate of hazard exposure by a minority population, low-income population, or Indian tribe to an environmental hazard is significant (as employed by NEPA) and appreciably exceeds or is likely to appreciably exceed the risk or rate to the general population or other appropriate comparison group; and

(c) Whether health effects occur in a minority population, low-income population, or Indian tribe affected by cumulative or multiple adverse exposures from environmental hazards."

[1] The definitions for "low-income population," "minority," and "minority population" are found in Section 1-101 of Executive Order 12898.

Further guidance is provided for determining disproportionate environmental effects:

"When determining whether environmental effects are disproportionately high and adverse, agencies are to consider the following three factors to the extent practicable:

(a) Whether there is or will be an impact on the natural or physical environment that significantly (as employed by NEPA) and adversely affects a minority population, low-income population, or Indian tribe. Such effects may include ecological, cultural, human health, economic, or social impacts on minority communities, low-income communities, or Indian tribes when those impacts are interrelated to impacts on the natural or physical environment; and

(b) Whether environmental effects are significant (as employed by NEPA) and are or may be having an adverse impact on minority populations, low-income populations, or Indian tribes that appreciably exceeds or is likely to appreciably exceed those on the general population or other appropriate comparison group; and

(c) Whether the environmental effects occur or would occur in a minority population, low-income population, or Indian tribe affected by cumulative or multiple adverse exposures from environmental hazards."

For this Proposed Action, analysis for EO 12898 requires assessment of readily available demographic data on the local, regional, and national populations, including race and ethnicity, age, income, and poverty metrics. Information to support this analysis is derived from US Census Bureau and San Diego Association of Governments (SANDAG) readily accessible documents and internet sites. The US Decennial Census forms the basis of the data for 2000, which is completed every 10 years, with the next scheduled census occurring in 2010. The US Census Bureau also conducts ongoing surveys to supplement the decennial survey, and the most recent US Census American Community Survey (ACS) for 2007 data is used to document the most recent conditions. The SANDAG publication "2030 Regional Growth Forecast Update" is referenced for economic and population trends in the San Diego County area through 2030. Cumulative impacts are addressed in Section 4.

EO 13045 *Protection of Children From Environmental Health Risks and Safety Risks*, focuses on environmental health risks and safety risks that may affect children. This EO was prompted by the recognition that children are more sensitive than adults to adverse environmental health and safety risks because they are still undergoing physiological growth and development. For this Proposed Action, analysis for EO 13045 requires assessment of readily available information regarding demographic data on the local, regional, and national populations, and, in particular, children less than 18 years old to evaluate the number and distribution of children in the region and whether these children are exposed to environmental health and safety risks from the Proposed Action. Information to support this analysis is derived from the US Census Bureau (2000 census and 2007 ACS) and identified locations with potentially high concentrations of children, such as schools, recreational areas for children, and residential areas.

#### 3.15.1.3.1 Regional Setting

The Silver Strand Training Complex (SSTC) is located in a populated urban area and is accessible from the greater San Diego metropolitan area via the Coronado Bay Bridge and State Route 75 through Imperial Beach. As presented in Section 3.1, Land Use, the land use in the surrounding areas consists of mixed residential and commercial, hotel/motel, commercial recreation, civic use, open space, and military land uses.

#### 3.15.1.3.2 Region of Influence

The region of influence (ROI) is the area of southwestern San Diego County, surrounding SSTC. This area includes the cities of Coronado and Imperial Beach, and also includes Navy housing communities. The summary of socioeconomics activity in the ROI is compiled from regional and federal government sources. For environmental justice and protection of children, the air quality, water resources, acoustic, and public health and safety concerns with the ROI are evaluated in regard to effects to low-income, minority, and children populations.

### 3.15.1.4 Regional Employment

The economy of the San Diego region is diversified; the leading employment sectors are business and professional services, retail trade, government, and hospitality. As of December 2008, the county average unemployment rate was 6.9 percent, which is below the state rate of 5.6 percent but above the federal rate of 4.5 percent (San Diego Workforce Partnership 2008). The estimated total employment for San Diego County, the City of Imperial Beach, and the City of Coronado is shown in Table 3.15-1. The estimated total employment for San Diego County is expected to increase 36 percent from 2000 to 2030. The City of Imperial Beach has a smaller anticipated increase of 18 percent (SANDAG 2008). This is due to the full use of properties within the city for residential and commercial structures—the built-out character of the City of Imperial Beach. The City of Coronado is projected to have an increase of 12 percent due to the similar built-out character of the city.

**Table 3.15-1: Estimated Total Employment**

| | 2000[1] | 2004[2] | 2010[3] | 2020[3] | 2030[3] | Percent Change from 2000 to 2030 |
|---|---|---|---|---|---|---|
| San Diego County | 1,384,673 | 1,449,349 | 1,573,742 | 1,741,033 | 1,913,682 | 36% |
| City of Imperial Beach[4] | 3,931 | 4,189 | 4,189 | 4,539 | 4,792 | 18% |
| City of Coronado[4] | 29,913 | 33,708 | 33,935 | 34,041 | 34,043 | 12% |

[1] U.S. Census 2000, [2] SANDAG 2008, [3] US Census 2007, [4] Includes military and civilian employment

The Naval Base Coronado (NBC) employs over 36,000 military and civilian personnel and is considered the largest workforce in San Diego County (Department of the Navy 2008). Many of the NBC military and civilian workforce support training activities at SSTC.

### 3.15.1.5 Regional Housing

According to the 2000 census, housing stock in San Diego County was 1,040,149 units. As summarized in Table 3.15-2, the number of housing units for San Diego County is expected to increase 25 percent from the year 2000 to 2030 (SANDAG 2008). The City of Imperial Beach projects a smaller increase of 19 percent over the same 30-year time frame. The City of Coronado has a projected housing increase of only 2 percent. The relatively small increases for Imperial Beach and Coronado are because of the built-out character of these cities.

**Table 3.15-2: Estimated Total Housing Units**

| | 2000[1] | 2007[2] | 2010[3] | 2020[3] | 2030[3] | Percent Change From 2000 To 2030 |
|---|---|---|---|---|---|---|
| San Diego County | 1,040,149 | 1,131,749 | 1,174,180 | 1,309,340 | 1,383,803 | 25% |
| City of Imperial Beach | 9,739 | 9,881 | 9,830 | 11,349 | 12,063 | 19% |
| City of Coronado | 9,494 | 9,436 | 9,405 | 9,690 | 9,796 | 2% |

[1] U.S. Census 2000, [2] US Census 2007 American Community Survey, [3] SANDAG 2008

Naval Amphibious Base (NAB) Coronado includes military housing for both unaccompanied personnel and families. Unaccompanied personnel housing for officers is located on the southwest bayside section of NAB; unaccompanied enlisted housing is located on both the oceanside and bayside portions of NAB. Officer family housing is located in the southern bayside section of NAB; this housing area consists of single-family and duplex housing units, some of which front San Diego Bay.

Naval Special Warfare student housing is located on the oceanside portion of NAB. Permanent personnel and transient students are billeted in housing on the bayside portion of NAB. An enlisted family housing area is located immediately south of the Fiddler's Cove Marina; the housing area consists of duplex and townhome units and the Silver Strand Elementary School, which is operated by the Coronado Unified School District for students living on Silver Strand in Navy housing and Coronado residential areas.

### 3.15.1.6 Population Demographics

SSTC and neighboring communities are located in the southwestern portion of San Diego County, California. Table 3.15-3 presents population characteristics, including the population in 2000, estimated 2007 population, and projected population for 2010, 2020, and 2030. The projected percent change from 2000 to 2030 for San Diego County population is expected to increase 29 percent, while population growth for the cities of Imperial Beach and Coronado are expected to increase at lower rates of 17 and 19 percent, respectively, primarily due to the built-out character of these two communities.

**Table 3.15-3: Estimated Population Growth for San Diego County, SSTC, and Surrounding Area**

| | 2000[1] | 2007[2] | 2010[3] | 2020[3] | 2030[3] | Percent Change from 2000 to 2030 |
|---|---|---|---|---|---|---|
| San Diego County | 2,813,833 | 2,954,960 | 3,245,279 | 3,635,855 | 3,984,753 | 29% |
| City of Imperial Beach | 26,992 | 25,023 | 27,799 | 28,331 | 32,590 | 17% |
| City of Coronado | 24,100 | 22,022 | 26,591 | 27,512 | 29,738 | 19% |

[1] U.S. Census 2000, [2] US Census 2007 American Community Survey, [3] SANDAG 2008

#### 3.15.1.6.1 Minority Populations

Table 3.15-4 provides the racial and ethnic composition for the cities, county, state, and nation, using the 2000 census and 2007 ACS data. In general, the City of Imperial Beach has a racial and ethnic composition similar to the County of San Diego and California while the City of Coronado has fewer minorities than the county, state, or national populations. The City of Imperial Beach has a higher percentage of Hispanic than county, state or national populations.

**Table 3.15-4: Population, Race, and Ethnicity for the SSTC ROI**

| Race / Ethnicity | City of Imperial Beach | | City of Coronado | | San Diego County | | California | | USA | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 2000 [1] | 2007 [2] | 2000 | 2007 | 2000 | 2007 | 2000 | 2007 | 2000 | 2007 |
| **Population** | **26,992** | **25,023** | **24,100** | **22,202** | **2,813,833** | **2,954,960** | **33,871,648** | **36,264,467** | **281,421,906** | **298,757,310** |
| White persons (%) | 62.3 | 71.8 | 84.4 | 89.2 | 66.5 | 69.5 | 59.5 | 60.4 | 75.1 | 74.1 |
| Black or African American persons (%) | 5.3 | 5.1 | 5.1 | 4.9 | 5.7 | 5.2 | 6.7 | 6.3 | 12.3 | 12.4 |
| American Indian and Alaskan Native persons (%) | 1.1 | 0.8 | 0.7 | 0.7 | 0.9 | 0.7 | 1.0 | 0.7 | 0.9 | 0.8 |
| Asian persons (%) | 6.5 | 5.4 | 3.7 | 1.9 | 8.9 | 10.2 | 10.9 | 12.2 | 3.6 | 4.3 |
| Native Hawaiian and Pacific Islander (%) | 0.6 | 0.6 | 0.3 | 0.2 | 0.5 | 0.4 | 0.3 | 0.4 | 0.1 | 0.1 |
| Other race (%) | 17.8 | 11.4 | 3.1 | 0.8 | 12.8 | 10.3 | 16.8 | 16.8 | 5.5 | 6.2 |
| Two or more races (%) | 6.5 | 5.0 | 2.6 | 2.4 | 4.7 | 3.6 | 4.7 | 3.3 | 2.4 | 2.1 |
| Hispanic [3] | 40.1 | 43.9 | 9.8 | 13.1 | 26.7 | 29.9 | 32.4 | 35.7 | 12.5 | 14.7 |

[1] U.S. Census 2000, [2] From the US Census 2007 American Community Survey, [3] The Hispanic category is an ethnic, rather than a racial distinction. These tables therefore include only non-Hispanic individuals in the black, white, and other categories to avoid over counting.

### 3.15.1.6.2 Low-Income Populations

Table 3.15-5 depicts median household income and poverty levels for the cities, county, state, and nation, using the 2000 census and 2007 ACS data. In general, the City of Imperial Beach has a median household income below Coronado, San Diego County, California, and the USA. The City of Imperial Beach also has a greater percentage of persons below the poverty level than Coronado, San Diego County, California, and the USA.

**Table 3.15-5: Low-Income Populations for the SSTC ROI**

| Metrics | City of Imperial Beach | | City of Coronado | | San Diego County | | California | | USA | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 2000 [1] | 2007 [2] | 2000 | 2007 | 2000 | 2007 | 2000 | 2007 | 2000 | 2007 |
| Population | 26,992 | 25,023 | 24,100 | 22,202 | 2,813,833 | 2,954,960 | 33,871,648 | 36,264,467 | 281,421,906 | 298,757,310 |
| Median household income | $35,882 | $46,214 | $66,544 | $80,132 | $47,067 | $71,139 | $47,493 | $58,361 | $41,994 | $50,007 |
| % Persons below poverty | 18.8 | 16.8 | 5.0 | 7.6 | 12.4 | 11.3 | 14.2 | 13.0 | 12.4 | 13.3 |

[1] U.S. Census 2000, [2] US Census 2007 American Community Survey

### 3.15.1.7 Children in the Communities

EO 13035 requires assessment of readily available information regarding demographic data on the local, regional, and national populations for children. Children are defined as individuals less than 18 years of age for the purposes of this assessment. Information to support this analysis is derived from the US Census Bureau (2000 census and 2007 ACS) and identified locations with potentially high concentrations of children, such as schools, recreational areas for children, and residential areas in areas potentially exposed to project impacts.

#### 3.15.1.7.1 Population of Children

Table 3.15-6 depicts percentage of population less than 18 years of age and average family size for the cities, county, state, and nation, using the 2000 census and 2007 ACS data. The City of Imperial Beach's population of children is similar to San Diego and California, while the City of Coronado has fewer children than the City of Imperial Beach, county, state, or national populations. City of Coronado population includes children located in NAB family housing as well. Areas within the cities of Coronado and Imperial Beach with higher concentrations of children are addressed in the following subsection.

**Table 3.15-6: Population of Children in the SSTC ROI**

| Metrics | City of Imperial Beach | | City of Coronado | | San Diego County | | California | | USA | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 2000 [1] | 2007 [2] | 2000 | 2007 | 2000 | 2007 | 2000 | 2007 | 2000 | 2007 |
| Population | 26,992 | 25,023 | 24,100 | 22,202 | 2,813,833 | 2,954,960 | 33,871,648 | 36,264,467 | 281,421,906 | 298,757,310 |
| Population less than 18 years of age (%) | 29.4% | 26.8% | 16.0% | 17.2% | 25.7% | 25.1% | 27.3% | 25.9% | 25.7% | 24.7% |
| Average family size | 3.30 | 3.17 | 2.84 | 2.88 | 3.29 | 3.34 | 3.43 | 3.52 | 3.14 | 3.19 |

[1] U.S. Census 2000, [2] US Census 2007 American Community Survey

#### 3.15.1.7.2 Schools

According to the California Department of Education, Coronado Unified School District, South Bay Union School District, and Sweetwater Union High School District, approximately 12,000 students are enrolled in elementary, middle and high schools in the cities of Imperial Beach and Coronado, including the NAB family housing area. Schools located within the region of influence (as defined by the maximum extent of acoustic impacts, see Section 3.6) include the following public elementary, middle and high schools: Bayside Elementary School, Central Elementary School, Harbor View Elementary School, Imperial Beach Elementary School, Mar Vista High School, Mar Vista Middle School, Oneonta School Elementary School, Silver Strand Elementary School, and West View Elementary School (Figure 3.1-3).

Of these schools, three elementary schools are near SSTC. Bayside Elementary School is located on the north side of Imperial Beach, adjacent to the salt works in south San Diego Bay. West View Elementary School is located on the southern boundary of SSTC-South (SSTC-S). The Silver Strand Elementary School is located in on the bayside portion of SSTC-North (SSTC-N), approximately 1,000 feet from the ocean beach and 500 feet from bayside beaches.

#### 3.15.1.7.3 Recreational Areas

Recreational areas in the ROI include nature preserves, parks, parkways, beaches, playgrounds, and community gardens. Outdoor recreation entails programs, activities, or opportunities dependent upon the natural environment. Examples include fishing, picnicking, surfing, bird-watching, hiking and interpretive trails, and camping areas. Many outdoor recreational opportunities are available in the SSTC ROI (see Table 3.1-1).

One of the main recreational opportunities for children in the ROI is the YMCA Camp Surf, located in the southwest corner of SSTC-S. The YMCA operates approximately twelve, one-week camp sessions annually, for children between the ages of seven and sixteen, on 80 acres of land under lease from the US Navy. This camp, located on ocean frontage, consists of housing units, mobile homes, and recreational vehicles associated with the camp. According to the YMCA, approximately 10,000 children use Camp Surf each year. While some of the children are day campers, the majority are onsite 24 hours per day.

### 3.15.1.8 Current Mitigation Measures

There are no current mitigation measures related to socioeconomics, environmental justice, and protection of children. However, mitigation measures in place for other resources (e.g., Section 3.3 Air Quality, Section 3.5 Water Resources, Section 3.6 Acoustic Environment, and Section 3.16 Public Health and Safety) also ensure that non-participants, including children, are not affected by Navy actions:

- Air Quality (Section 3.3) – Air emissions do occur at SSTC but do not pose human health or environmental risks as emissions are *de minimis*.
- Water Resources (Section 3.5) – Water discharges do occur at SSTC but do not pose health or environmental risks as water quality standards are not exceeded by discharges.
- Acoustic Environment (Section 3.6) – Major sources of sound at SSTC include helicopters used for insertion and extraction of exercise participants, amphibious vessels involved in landing exercises, pile-drivers involved in ELCAS training, and munitions used in a variety of exercises. Based on the distribution and magnitude of noise sources, surrounding communities, including Coronado, Imperial Beach, and NAB housing areas, are affected by training noise.
- Public Health and Safety (Section 3.16) – The Navy has specific and documented procedures in place to ensure that non-participants, including children, are not endangered by Navy actions, including fencing, guards, and signage.

## 3.15.2 Environmental Consequences

This section focuses on potential impacts and overall changes, as they relate to employment, housing, low income and minority populations, and protection of children, associated with implementation of all current and proposed training activities at SSTC. Assessments of environmental justice and protection of children are intertwined with other environmental topics. In particular, air emissions, water discharges, and noise emissions from the Proposed Action may affect the quality of air, water resources, and public health and safety in communities surrounding SSTC. Air emissions and pollutants are addressed in Section 3.3, Air Quality, in accordance with the Clean Air Act. Effects to water quality of the ocean are addressed in Section 3.5, Water Resources. The effect of noise from training is addressed in Section 3.6, Acoustic Environment and health and safety issues are addressed in Section 3.16, Public Health and Safety.

### 3.15.2.1 Approach to Analysis

The socioeconomic analysis addresses the potential for Navy training activities to affect, either positively or negatively, the basic attributes and resources associated with the human environment, particularly, population and economic activity. Economic activity encompasses employment, personal income, and industrial growth.

In compliance with EO 12898, *Federal Actions to Address Environmental Justice in Minority and Low-Income Populations*, this analysis addresses, as appropriate, disproportionately high and adverse human health or environmental effects of the Proposed Action on minority and low-income populations. Minority and low-income populations are indentified using readily available demographic data on the local, regional, and national populations, including race and ethnicity, age, income, and poverty metrics.[2] The Navy's training activities that result in air emissions, water discharges, and noise emissions from the Proposed Action are considered to have significant environmental justice impacts if training activities generate disproportionately high environmental effects on low income or minority populations within the ROI.

In compliance with EO 13045, *Protection of Children From Environmental Health Risks and Safety Risks*, this analysis examines demographic data on the local, regional, and national populations; and, in particular on children, to evaluate the number and distribution of children in the region and whether these children are exposed to environmental health and safety risks from the Proposed Action. The Navy's training activities that result in air emissions, water discharges, and noise emissions are considered to have a significant environmental health and safety risks if SSTC activities generate disproportionately high environmental effects on populations of children within the ROI. Potential effects include health and safety concerns such as hearing loss, non-auditory health effects, and interruption of communication or attention in nearby residences and schools with children present (see Section 3.6, Acoustic Environment)

### 3.15.2.2 No Action Alternative

Under the No Action Alternative, the number of personnel stationed at SSTC and tempo of training would remain the same as the baseline conditions.

#### 3.15.2.2.1 Socioeconomics

No changes to the current socioeconomic conditions (employment, housing, and population growth) of southwestern San Diego County are expected under the No Action Alternative as the Navy will maintain baseline levels of personnel and staffing already employed in the region. In addition, increases in training activities associated with the Proposed Action and alternatives are not expected to disrupt normal business operations including hotel, tourism, and restaurant commerce in the ROI. Therefore, regional and community economic, employment, housing, and population growth are not affected by the No Action Alternative.

#### 3.15.2.2.2 Environmental Justice

Based on the analysis presented herein on air quality, water resources, acoustics, and public health and safety associated with the No Action Alternative, the following conclusions are presented in regard to human health and environmental effects to low-income communities and minority populations:

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[2] Demographic information to support analyses related to Environmental Justice and Protection of Children is derived from US Census Bureau and SANDAG readily accessible documents and internet sites. The US Decennial Census forms the basis of the data for 2000, which is completed every 10 years, with the next scheduled census occurring in 2010. The US Census Bureau also conducts ongoing surveys to supplement the decennial survey, and the most recent US Census ACS for 2007 data is used to document the most recent conditions. The SANDAG publication "2030 Regional Growth Forecast Update" is referenced for economic and population trends in the San Diego County area through 2030.

- Air Quality (Section 3.3) – Air emissions do occur from the No Action Alternative but do not pose human health or environmental risks as emissions are *de minimis*, and, do not pose health or environmental risks disproportionately on low-income communities and minority populations and Indian tribes, as all surrounding communities are affected by air emissions from this action.
- Water Resources (Section 3.5) – Water discharges do occur from the No Action alternative but do not pose health or environmental risks as water quality standards are not exceeded by discharges, and, do not pose health or environmental risks disproportionately on low-income communities and minority populations and Indian tribes as all surrounding communities are affected by water discharges from this action.
- Acoustic Environment (Section 3.6) – Major sources of sound at SSTC include helicopters used for insertion and extraction of exercise participants, amphibious vessels involved in landing exercises, pile-drivers involved in ELCAS training, and munitions used in a variety of exercises. Concerns related to noise from the No Action Alternative on the surrounding communities include hearing loss, non-auditory health effects, and speech interference/temporary attention. Based on the distribution and magnitude of noise impacts under the No Action Alternative, surrounding communities, including Coronado, Imperial Beach, and NAB housing areas, are affected by training noise; however, no disproportionate effect on low income or minority populations or Indian tribes occur.
- Public Health and Safety (Section 3.16) – The Navy has specific and documented procedures in place to ensure that non-participants, including children, are not endangered by Navy actions, including fencing, guards, and signage.

Therefore, no disproportionately high and adverse human health or environmental effects of the No Action are anticipated on minority populations and low-income populations.

#### 3.15.2.2.3 Protection of Children

Based on the analysis presented in Section 3.3 Air Quality, 3.5 Water Resources, and 3.6 Acoustic Environment associated with the No Action Alternative, no disproportionate environmental health and safety risks specific to children are expected.

### 3.15.2.3 Alternative 1 (Preferred Alternative)

Implementation of Alternative 1 would increase the training tempo and would include the introduction of new types of training, conducting existing routine training at additional locations within SSTC established training areas, and increasing training access to, and availability of, existing beach and inland training areas.

#### 3.15.2.3.1 Socioeconomics

Implementation of Alternative 1 would not result in an increase in permanently stationed personnel or employees at SSTC. Training activities and tempo under Alternative 1 would be implemented by Navy personnel and staffing already employed in the region. In addition, increases in training activities associated with the Proposed Action and alternatives are not expected to disrupt normal business operations including hotel, tourism, and restaurant commerce in the ROI. Therefore, regional and community economic, employment, housing, and population growth are not expected to be affected by Alternative 1.

#### 3.15.2.3.2 Environmental Justice

Based on the analysis presented herein on air quality, water resources, acoustics, and public health and safety associated with the No Action Alternative, the following conclusions are presented in regard to human health and environmental effects to low-income communities and minority populations:

- Air Quality (Section 3.3) – Air emissions do occur from Alternative 1 but do not pose human health or environmental risks as emissions are *de minimis*. Additionally, they do not pose health or environmental risks disproportionately on low-income communities and minority populations and Indian tribes as all surrounding communities are affected by air emissions from this action.
- Water Resources (Section 3.5) – Water discharges do occur from the Alternative 1 but do not pose health or environmental risks as water quality standards are not exceeded by discharges. Additionally, they do not pose health or environmental risks disproportionately on low-income communities and minority populations and Indian tribes as all surrounding communities are affected by water discharges from this action.
- Acoustic Environment (Section 3.6) – Major sources of sound at SSTC include helicopters used for insertion and extraction of exercise participants, amphibious vessels involved in landing exercises, pile-drivers involved in ELCAS training, and munitions used in a variety of exercises. Concerns related to noise from Alternative 1 on the surrounding communities include hearing loss, non-auditory health effects, and speech interference/temporary attention. Based on the distribution and magnitude of noise impacts under Alternative 1, surrounding communities, including Coronado, Imperial Beach, and NAB housing areas, are affected by training noise; however, no disproportionate effect on low income or minority populations or Indian tribes occur.
- Public Health and Safety (Section 3.16) – The Navy has specific and documented procedures in place to ensure that non-participants, including children, are not endangered by Navy actions, including fencing, guards, and signage.

Therefore, no disproportionately high and adverse human health or environmental effects of Alternative 1 are anticipated on minority populations and low-income populations.

#### 3.15.2.3.3 Protection of Children

Based on the analysis presented in Section 3.3 Air Quality, 3.5 Water Resources, and 3.6 Acoustic Environment under Alternative 1, no disproportionate environmental health and safety risks specific to children are expected.

### 3.15.2.4 Alternative 2

The only difference between Alternative 1 and 2 is that, under Alternative 2, all SSTC-N oceanside beach training areas would be available for Navy training, regardless of time of year. Water quality, air quality, and acoustical noise effects are the same as Alternative 1. Thus, implementation of Alternative 2 would have similar socioeconomic, environmental justice, and protection of children effects as Alternative 1.

## 3.15.3 Proposed Mitigation Measures

No adverse socioeconomic effects were identified; therefore, no proposed mitigation measures are warranted. However, mitigation measures proposed for other resources (e.g., Water Resources [Section 3.5], Acoustic Environment [Section 3.6], and Public Health and Safety [Section 3.16]) would serve to further minimize effects related to environmental justice and protection of children.

## 3.15.4 Unavoidable Adverse Environmental Effects

There are no unavoidable adverse socioeconomic effects identified.

## 3.15.5 Summary of Effects

Table 3.15-7 summarizes effects and mitigation measures for the No Action Alternative, Alternative 1, and Alternative 2.

**Table 3.15-7: Summary of Effects**

| Alternative | Summary of Effects |
|---|---|
| **No Action Alternative** | • Navy presence currently has a beneficial socioeconomic impact on the region.<br>• EO 12898 – There are no disproportionately high and adverse human health or environmental effects of the No Action Alternative on minority populations and low-income population or Indian tribes.<br>• EO 13045 – Under the No Action Alternative no disproportionate environmental health and safety risks specific to children are expected. |
| **Alternative 1** | • Socioeconomics - Existing regional population and associated housing impacts, employment rates, and regional economy would remain unchanged.<br>• EO 12898 – There would be no disproportionately high and adverse human health or environmental effects of Alternative 1 on minority populations and low-income populations or Indian tribes.<br>• EO 13045 – Under Alternative 1 no disproportionate environmental health and safety risks specific to children are expected. |
| **Alternative 2** | • Impacts are expected to be the same as Alternative 1. |
| **Mitigation Measures** | • Mitigation measures proposed for other resources (e.g., Water Resources [Section 3.5], Acoustic Environment [Section 3.6], and Public Health and Safety [Section 3.16]) would serve to further minimize effects related to environmental justice and protection of children. |

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# 3.16 Public Health and Safety

# 3.16 PUBLIC HEALTH AND SAFETY

## 3.16.1 Introduction

### 3.16.1.1 Definition

Public health and safety issues are defined as those elements of the Proposed Action that directly affect the health and safety of individuals in the communities adjacent to Silver Strand Training Complex (SSTC). The Navy's policy is to use every possible precaution in planning and executing all onshore or offshore activities—to prevent injury to people or damage to property. Effects that occur within Navy-controlled areas do not pose a substantial public safety or health concern because the public normally does not have access to these areas.

This public health and safety assessment addresses effects that are not entirely contained within Navy-controlled areas, and to training activities that take place in areas of public use. Proposed Action effects that do not directly affect an individual's health or safety are not considered in this assessment. Also, concerns that affect single individuals and isolated incidents may not rise to the level of a public health or public safety issue. Noise effects are not addressed in this section (Section 3.6, Acoustic Environment); thus, the resource to be evaluated for Proposed Action effects is the collective health and safety of groups of individuals in the communities adjacent to SSTC training areas.

### 3.16.1.2 Regional Setting

SSTC training activities occur on and adjacent to the Silver Strand peninsula—an isthmus of land with the Pacific Ocean to the west and San Diego Bay to the east. The City of Coronado abuts the southern boundary of Naval Air Station, North Island (NASNI) and borders SSTC-North (SSTC-N) on the north and south. The City of Imperial Beach adjoins SSTC-South (SSTC-S). State Route (SR) 75 traverses the peninsula from north to south, bisecting SSTC and connecting the City of Coronado with the City of Imperial Beach. In the event of a natural disaster or other public emergency, SR-75 is the sole evacuation route for vehicular traffic to and from SSTC-N facilities on the Silver Strand peninsula.

### 3.16.1.3 Region of Influence

The Region of Influence (ROI) for public health and safety concerns includes SR-75, those portions of the cities of Coronado and Imperial Beach adjoining SSTC, those portions of San Diego Bay adjoining SSTC, and offshore ocean areas adjacent to SSTC and NASNI. Areas of heightened sensitivity to public health and safety concerns within the ROI include residential districts—where substantial populations of people are present at all times of the day and night—and areas where large groups of people may gather, such as parks, marinas, public beaches, and other recreational open spaces.

## 3.16.2 Affected Environment

### 3.16.2.1 Hazards Overview

#### 3.16.2.1.1 Electromagnetic Radiation

Communications and electronic devices such as radar, electronic jammers, and other radio transmitters produce Electromagnetic Radiation (EMR). Equipment that produces an electromagnetic field has the potential to generate hazardous levels of EMR. An EMR hazard exists when transmitting equipment generates electromagnetic fields that induce currents strong enough or voltages high enough to trigger electro-explosive devices in ordnance, to directly harm people or wildlife, or to create sparks that can ignite flammable substances. Hazards are reduced or eliminated by establishing minimum distances between EMR emitters and people, ordnance, and fuels.

Hazards of Electromagnetic Radiation to Personnel (HERP), Hazards of Electromagnetic Radiation to Ordnance (HERO), and Hazards of Electromagnetic Radiation to Fuel (HERF) have been determined for EMR sources, based on their operating frequency and power output. Navy personnel use low-power communications equipment, such as two-way radios and cell phones, during training. No known hazards to personnel (HERP), ordnance (HERO), or fuel (HERF) exist at SSTC, and there are no hazards to the public in off-site areas; therefore this issue will not be addressed further in this Environmental Impact Statement (EIS).

#### 3.16.2.1.2 Training Ordnance

Explosives, pyrotechnic devices (e.g., smoke grenades), and other ordnance (e.g., blanks, simunitions) used for training are transported to SSTC by ground vehicles, stored on site, and used in accordance with Navy standard operating procedures. The types and amounts of explosive materials that may be stored at a single location are determined by the quantity-distance requirements established by the Department of Defense (DoD) Explosives Safety Board. Explosive Safety Quantity Distance (ESQD) arcs determine the minimum safe separation between munitions storage areas and habitable structures. The Navy has established ESQDs for ordnance storage lockers used for SSTC training activities (Figure 3.16-1). Further, safety zones are established during the use of explosives in training activities involving underwater detonations (Section 3.16.2.1.6).

#### 3.16.2.1.3 Aircraft Accident Potential

Guidelines for establishing aviation safety zones around helicopter landing zones (LZs) are identified in NAVFAC P-80.3, and include clear zones and Accident Potential Zones (APZs). Infrequent helicopter activities—such as at SSTC—require designation of a clear zone, but not APZs. The clear zone for Visual Flight Rule (VFR) aircraft is the same as the takeoff safety zone. The takeoff safety zone constitutes the area under the approach/departure surface until that surface is 50 to 100 feet above the landing zone elevation; this zone must be free of obstructions.

#### 3.16.2.1.4 High-Velocity Air/Overpressure

High-velocity air is expelled by hovercraft during amphibious activities. The high-velocity air exiting the hovercraft traps foreign objects, and then propels these objects with the force of the exhaust air. As the distance from the hovercraft increases, the velocity of the exhaust air decreases. While in operation, the hovercraft requires a 50-yard radius safety zone.

Helicopters generate high-velocity air, called rotor wash, during landing and takeoff. Small objects can be trapped in this air stream and thrown through the air. The area affected is proportional to the diameter of the helicopter’s rotor, with strong rotor wash occurring within an area of approximately three times the rotor diameter. The strength of the rotor wash is related to the weight of the helicopter, with rotor wash velocity increasing with increasing helicopter weight.

Overpressure from underwater detonations can pose a physical hazard in surrounding waters. Based on observations of Explosive Ordnance Disposal divers conducting the activity, detonating a 20- to 40-pound charge of explosives can create a 10-foot diameter crater in the ocean bottom (Section 3.5.2.3.2).

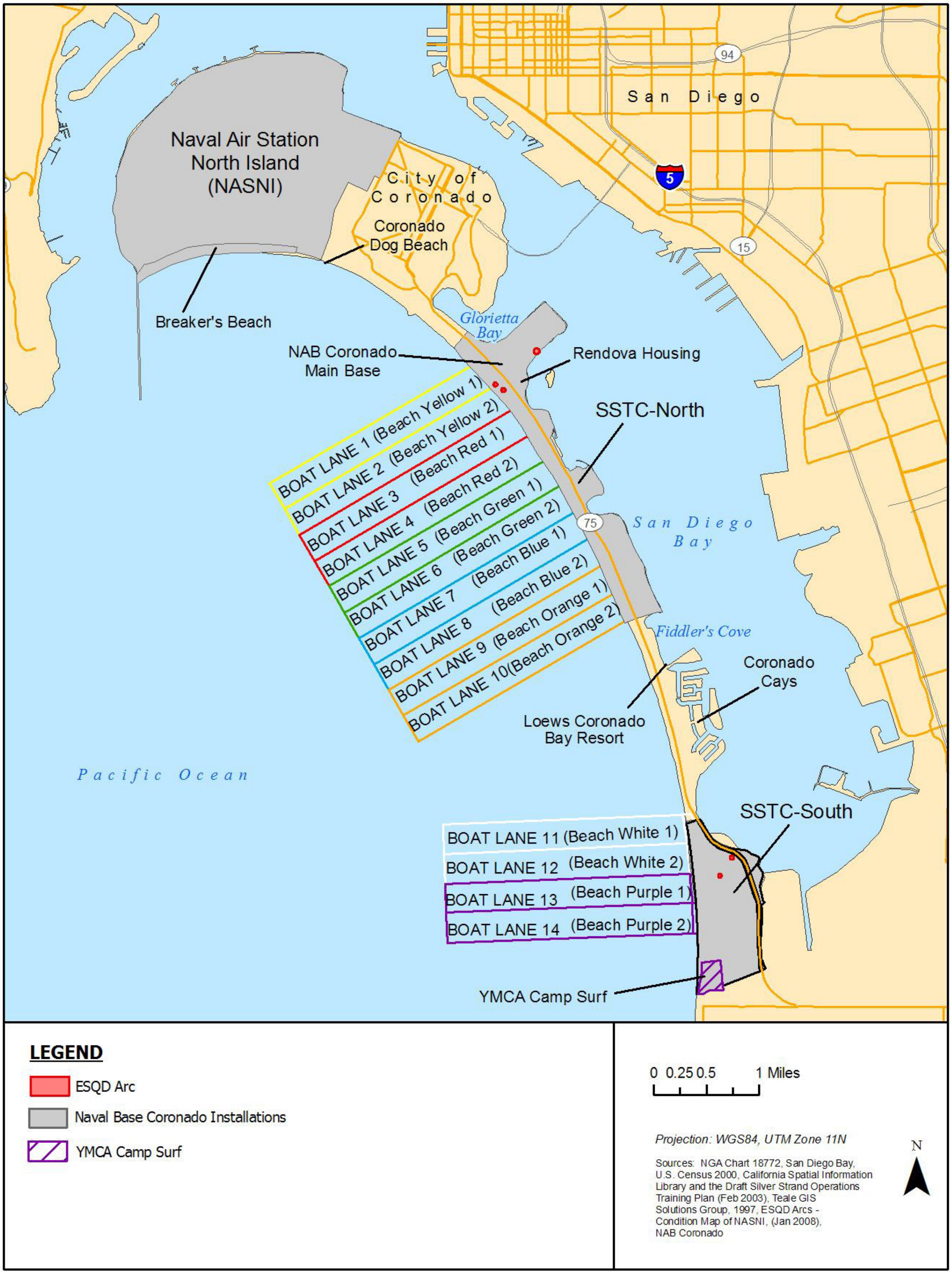


**Figure 3.16-1: SSTC ESQD Arcs**

#### 3.16.2.1.5 Public Access and Proximity

Generally, public access to SSTC is controlled for security reasons, and to safeguard against potential hazards associated with military activities. Potential hazards include EMR, ordnance storage and loading, heavy equipment operation, and amphibious activities. The control of public access to SSTC training areas is for safety concerns—to protect the public from harm. Training events or exercises in nearshore waters shared with recreational and commercial users may be delayed or relocated, if needed and if the area is not clear of nonparticipating vessels and individuals.

Public access to SSTC-N beaches from Coronado Municipal Beach to the north and Silver Strand State Beach to the south is restricted. The Navy leases the oceanside beaches and nearshore waters on SSTC-N; a fence that runs parallel to SR-75 prevents public access on the bayside.

At SSTC-S, the Navy owns the oceanside beach down to the mean high tide line and restricts public access to the beach training lanes (White 1 and 2 and Purple 1 and 2) above the mean high tide line. Training activities, when they are occurring, may require public access restrictions to one or more beach lanes below the mean high tide line, depending on the nature of the training activity (hazards, security, etc.). If and when restricted access is required, safety personnel are stationed to keep nonparticipants from harm, and to ensure mission security. Navy training scheduling varies on SSTC, and is not limited to any particular day or days of the year. When beach closure is required, it typically lasts from one to four hours; on average, for only about 2 hours. At these times, the public still has access to adjacent beaches.

#### 3.16.2.1.6 Underwater Detonations and Swimmer / Diver Safety

Swimmers and divers in the vicinity of Navy training activities involving underwater detonations could be exposed to over-pressure. Beyond specific thresholds, either impulse pressure (measured in pounds per square inch – millisecond [psi-msec]) or peak pressure (measured in psi) could injure individuals in the water. Excessive underwater pressure waves could damage hearing or vital organs. O'Keefe and Young (1984) determined that the criteria for safe distances from an underwater detonation for an unprotected swimmer to be less than 2 psi-msec (impulse pressure) or less than 100 psi (peak pressure). Based on modeling performed by the Naval Undersea Warfare Center (NUWC), the maximum estimated zone of influence for swimmers or divers from the types and intensities of underwater detonations conducted at SSTC is about 570 yards (NUWC 2009). As presented in Table 3.16-1, underwater detonation activities are distributed throughout the SSTC boat lanes, with larger charge weights restricted to the center boat lanes at SSTC-N and SSTC-S, which minimizes potential exposure outside of designated boat lanes.

#### 3.16.2.1.7 Installation Restoration Program

The migration of hazardous substances from historical waste deposits can pose a risk to public health. The Installation Restoration Program (IRP) was developed to identify, assess, characterize, and clean up or control contamination from past hazardous waste disposal activities and hazardous materials spills at DoD facilities. The IRP is a tool for identifying and cleaning up contaminant releases that could endanger public health, welfare, or the environment.

The DoN IRP process is designed in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) requirements. Its three phases are: 1) the study phase, which includes (a) preliminary assessment/site inspection and (b) remedial investigation/feasibility study; 2) the design phase, which includes (c) remedial design and (d) remedial action construction; and 3) the cleanup phase, which includes (e) interim removal action and remedial action, (f) remedial action operation, and (g) long-term management of the remedy.

**Table 3.16-1: SSTC Underwater Detonation Range Protocol**

| Charge Size | Boat Lane | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 |
| | Y1 | Y2 | R1 | R2 | G1 | G2 | B1 | B2 | O1 | O2 | W1 | W2 | P1 | P2 |
| VSW (0 – 4 fathoms) | | | | | | | | | | | | | | |
| Off bottom (< 3.6 lb) | | x | x | x | x | x | x | x | x | | | x | x | |
| Bottom (< 5 lb) | | x | x | x | x | x | x | x | x | | | x | x | |
| Bottom (< 15 lb) | | | x | x | x | x | x | x | | | | | | |
| Shallow (4 – 12 fathoms) | | | | | | | | | | | | | | |
| < 5 lb single | | x | x | x | x | x | x | x | x | | | x | x | |
| < 15 lb (multiple) | | | x | x | x | x | x | x | | | | | | |
| 15 – 29 lb | | | | | x | x | | | | | | | | |

Note: VSW off bottom (<3.6 lbs, SWAG) bayside activities occur in Echo

IRP sites on SSTC-N, SSTC-S, and NASNI are listed and described in Section 3.4.1.4.2 (Hazardous Materials and Wastes, CERCLA Sites). Based on the best available information, these sites pose no hazard to public health or safety, and training activities will not disturb or cause contaminants from these sites to be released and affect public health. While the natures and locations of these sites may need to be considered in planning training activities, there is no historical contamination associated with the Proposed Action. Therefore, any health or safety issues associated with IRP sites are not within the scope of environmental analyses performed in this EIS.

### 3.16.2.2 Hazards Ashore (Beach Activities)

SSTC is located in an urban area that is used heavily for recreational and commercial activities. Public beaches are located adjacent to both SSTC-N and SSTC-S; and public parks, bicycle paths, marinas, and boating areas are located in its vicinity. SSTC beach training areas are accessible from the water; thus, physical barriers and other security measures instituted to prevent public access from adjacent lands do not assure the complete isolation of the range. However, the types of training that take place at SSTC and the manner in which the training is conducted take into account the proximity of public areas and the lack of isolation.

#### 3.16.2.2.1 SSTC North (SSTC-N)

#### Ordnance Transportation and Storage

Ordnance arrives at SSTC-N via truck, and is transported to and from SSTC ordnance storage areas by an established route (U.S. Navy 1999). Flammable materials, explosives, and other hazardous materials such as ordnance are not allowed on Coronado Bridge, so these materials are transported on SR-75 via Imperial Beach. Base security notifies the Receiving Office in the Supply Department when these shipments arrive. Ground shipments of ordnance are escorted to storage areas by security personnel via predetermined routes. Once offloaded from a truck, ordnance is transported to storage locations or directly to a designated range area for use.

Ordnance is stored at three locations on SSTC-N (Figure 3.16-1). The SSTC-N ordnance storage facilities each require a 100-foot ESQD arc. An ESQD arc exists around Building 255, used by SSTC-N security personnel and other tenants. This building is an earth-covered magazine with a capacity of 1,000 pounds to store Class 1, Division 3, and Division 4 small arms ammunition and pyrotechnics. Three ready service lockers located on the oceanside behind Buildings 614, 616, and 600 also require ESQD arcs. These lockers are used by Naval Special Warfare (NSW) for training. The public is not affected by these ordnance storage facilities because the ESQD arcs are completely within Navy property.

### Accident Potential Zones

SSTC does not contain an airfield. The only air support facility at SSTC is the helicopter LZ at Turner Field. This LZ is located near the eastern edge of Naval Amphibious Base (NAB) Coronado's Main Base, adjacent to the Turner Field recreational area. Helicopters at SSTC operate under VFR. These activities are infrequent—three to four times per week—and normally provide support for administrative functions or operational training, such as rappelling and helicopter rope suspension training. The number of flights can triple during major training activities. On SSTC, helicopters are required to approach and depart from the LZ in an easterly direction over San Diego Bay.

### Public Access and Proximity

Within SSTC-N, bachelor housing (officer and enlisted) and officer family housing are located on NAB Coronado. On the Main Base, the officer family housing is located adjacent to Delta North Beach. This Rendova housing includes single-family units and duplexes, some of which front on San Diego Bay. Military housing at the southern end of SSTC-N is next to the Alpha, Bravo, and Charlie beaches and across SR-75 from Boat Lanes 7 through 10. Residential communities in the City of Coronado are to the north and south of SSTC-N.

Glorietta Bay Park adjoins NAB Coronado's Main Base on the north. Also to the north of SSTC-N, on the oceanside, is Coronado Shores, a 1,467-unit high-rise condominium complex. Silver Strand State Beach is between SSTC-N and SSTC-S on the oceanside of SR-75. On the bayside, Coronado Cays Park is located to the south of SSTC-N. A public bicycle path runs the length of Silver Strand peninsula. Public land uses near SSTC-N are described and their locations are shown in Land Use (Section 3.1).

On SSTC-N bayside, a fence parallel to Silver Strand Highway from Rendova Housing to Fiddler's Cove prevents public access from the land to bayside training areas. Oceanside access to the beach is controlled by a guard, posted on the northern edge of Yellow 1. In addition, trainers and trainees assure that nonparticipants do not enter training areas during a training activity if needed to ensure their safety.

### Installation Restoration Program

As noted in Section 3.16.2.1.7, IRP sites on SSTC-N are listed and described in Section 3.4.1.4.2.

### 3.16.2.2.2 SSTC South (SSTC-S)

### Public Access and Proximity

Loews Coronado Bay Resort Hotel and Coronado Cays residential development are located north of SSTC-S along the western side of SR-75, opposite Silver Strand State Beach. Land use on the southern side of SSTC-S in Imperial Beach is predominantly residential. Other nearby uses in Imperial Beach include an elementary school and some commercial development. Residential areas of Imperial Beach are located more than 2,000 feet south of Boat Lane 14; however, the residential areas about the southerly boundary of SSTC-S. The YMCA Camp Surf is located on land leased from the Navy in the southeastern corner of SSTC-S.

SSTC-S inland areas are fully fenced. Entrance into this area is controlled by guarded, manned gates. However, oceanside beaches are accessible from public beaches to the south. On SSTC-S oceanside beaches, Navy trainers and trainees assure that nonparticipants do not enter training areas during a potentially hazardous training event.

### Installation Restoration Program

As noted in Section 3.16.2.1.7, the IRP site on SSTC-S is described in Section 3.4.1.4.2.

### 3.16.2.2.3 Naval Air Station, North Island (NASNI)

### Public Access and Proximity

The public is not allowed access to NASNI; the shore areas of NASNI used for SSTC training activities are also not publicly accessible.

### Installation Restoration Program

As noted in Section 3.16.2.1.7, IRP sites on NASNI are listed and described in Section 3.4.1.4.2.

### 3.16.2.3 Hazards Afloat (Water Activities)

San Diego Bay and the nearshore ocean waters off the Silver Strand peninsula are heavily used for a variety of commercial, recreational, and institutional purposes. Glorietta Bay Marina is located next to NAB Coronado and training area Golf. The Navy's Fiddler's Cove Marina lies between training areas Delta I and Charlie. Swimming beaches, including those with the possible use of small, unpowered watercraft such as kayaks and inflatable rafts and boats, are located adjacent to Boat Lane 1, Boat Lane 10, and Boat Lane 11. YMCA Surf Camp, which teaches water sports to children, is located just south of Boat Lane 14.

In accordance with 33 CFR Part 334, Danger Zone and Restricted Area Regulations, portions of the bayside waters surrounding NAB and an offshore Pacific Ocean area have been designated Restricted Areas (33 CFR 334.860), bayside areas surrounding NASNI and specified piers across San Diego Bay (33 CFR 334.865), and waters at the mouth of the San Diego Bay harbor (33 CFR 334.870 and 33 CFR 334.880) (Figure 3.16-2). Within these areas, anchoring, dredging, dragging, seining, and other similar activities are prohibited without Navy approval.

Additionally, portions of the an area offshore of NASNI Breaker's Beach are designated as a Danger Zone for the NBC small arms range (33 CFR 334.866). The Danger Zone encompasses a 206 acre fan-shaped area over the Pacific Ocean near the entrance to San Diego Bay (Figure 3.16-2). This Danger Zone is open to fishing, general navigation, and training when no weapons firing is underway. When live fire is occurring at the small arms range, all fishing, general navigation, and training is prohibited in the Danger Zone to protect personnel from injury due to possible ricochets from the range. In addition, anchoring by any vessel within the Danger Zone is prohibited at all times.

The public is restricted from swimming, fishing, and waterskiing in the bayside areas surrounding NAB and NASNI (Figure 3.16-2); the portion of the Restricted Area within 120 feet of the NAB pierhead is limited to vessels that are owned by or under hire to NAB Coronado. San Diego Bay has no vessel traffic control system, but the Navy monitors radio communications, and informally provides traffic information to private and commercial vessels.

Naval Vessel Protection Zones established by U.S. Coast Guard regulations (33 CFR 165.2010) require other (non-Navy) vessels to slow to a minimum speed within 500 yards of a Navy vessel greater than 100 feet long; they are prohibited from approaching within 100 yards of a Navy vessel greater than 100 feet long.

### 3.16.2.4 Current Mitigation Measures

The Navy has specific and documented procedures in place to ensure that nonparticipants are not endangered by Navy actions. Personnel and first aid kits are on site for each training activity in the unlikely event of an injury. For underwater detonations, a safety zone is established for each training activity to protect swimmers and divers from injury.

Fences on portions of SSTC, and the use of gates and guards to control access, protect the public from potentially hazardous training activities. Navy monitoring of training events serves to identify potential public health and safety risks and avoid them. Mitigation measures for other resources that affect public health and safety would continue to be implemented.

#### 3.16.2.4.1 Exercise Planning

The Navy considers public safety in planning its exercises. Factors considered in evaluating the impact of the training on public safety include proximity of the activity to public areas; access control; schedule (time of day, day of week); public notification; frequency, duration, and intensity of activities; range safety procedures; operational control of hazardous activities or events; and safety history.

#### 3.16.2.4.2 Range Control

Current range control procedures at SSTC-N and SSTC-S limit unanticipated interactions with the public. On SSTC-N bayside, a fence parallel to Silver Strand Highway from Rendova Housing to Fiddler’s Cove prevents public access from the land to bayside training areas. Oceanside access to the beach is controlled by a watch guard posted on the northern edge of Yellow 1. SSTC-S inland areas are fully fenced. Entrance into these areas is controlled by manned gates. Signs also are posted to warn the public of potentially hazardous activities. Trainers and exercise participants are responsible for assuring that nonparticipants are not close enough that they are at risk during all land and water training activities.

#### 3.16.2.4.3 Range Inspection

Range users are instructed to discuss planned activities with the range scheduler to ensure that current and applicable range procedures are applied prior to conducting any activities. Scheduling officials regularly inspect beach areas.

#### 3.16.2.4.4 Coordination Procedures

Close coordination between military and civilian facilities enables effective, real-time, shared use. Notices to Mariners are issued for underwater detonations. An individual activity must be coordinated between the appropriate range scheduler and range user, at the time the range is scheduled for the operation.

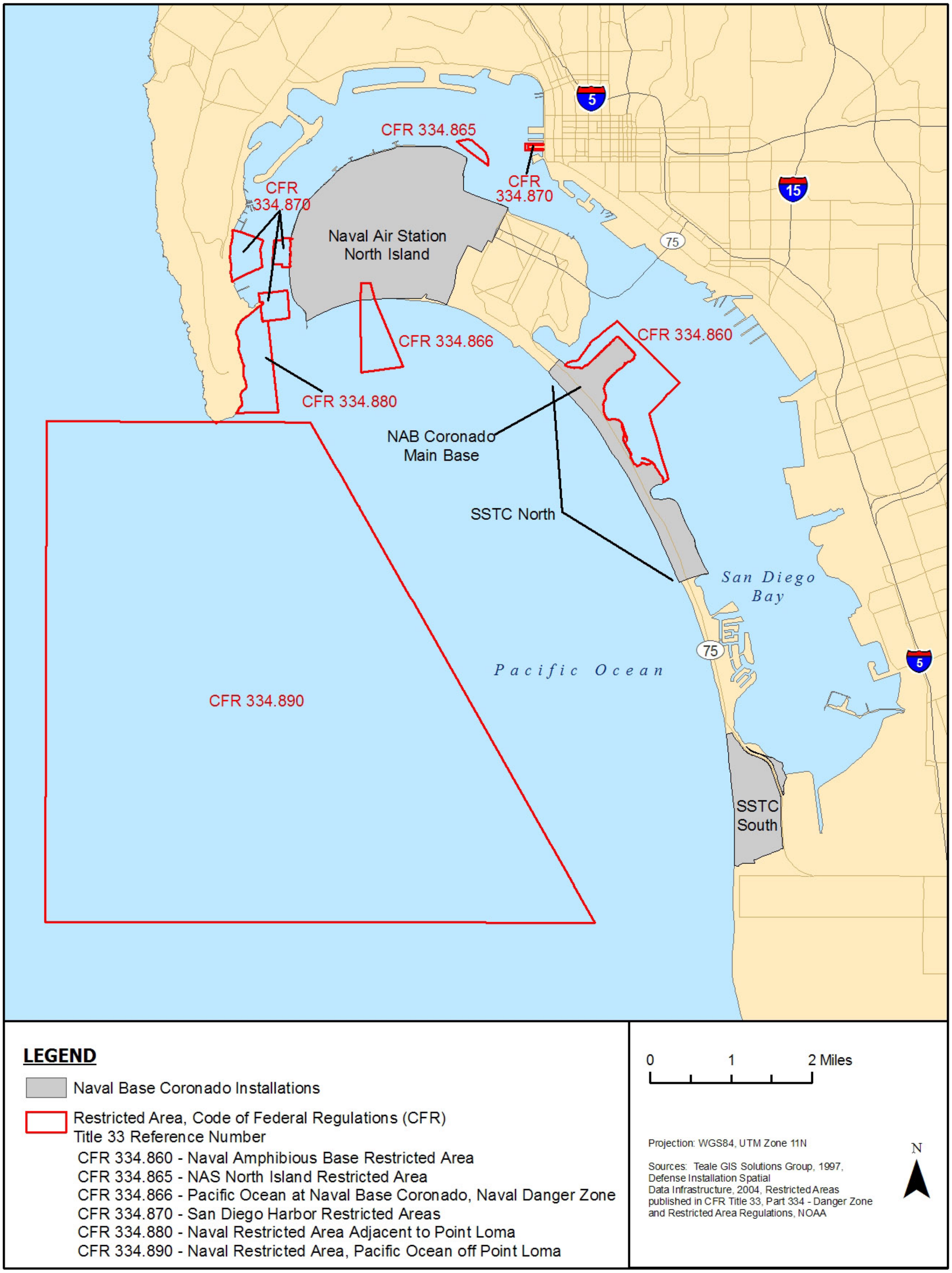


**Figure 3.16-2: Public Land Uses and Project Hazard Zones**

### 3.16.3 Environmental Consequences

Public health and safety is an interdisciplinary issue—aspects of which are intertwined with other environmental topics. Other sections will cover some of these topics. The potential for the release of hazardous substances to result in chronic health effects is addressed in Section 3.4, Hazardous Materials and Waste. Transportation of project personnel on public roads is addressed in Section 3.14, Transportation and Circulation. Hazardous air pollutants are addressed in Section 3.3, Air Quality, in accordance with the Clean Air Act's National Emissions Standards for Hazardous Air Pollutants regulations. Seismic hazards are addressed in Section 3.2, Geology and Soils. Human annoyance and the potential for hearing loss from training noise are addressed in Section 3.6, Acoustic Environment. The remaining public health and safety issues are addressed in this section.

This resource section focuses on groups of activities that could pose a credible risk to public health and safety. Similar types of activities are grouped together (aggregated) for ease of analysis. Types of activities that could pose a risk to public health are those in which hazardous constituents are released to the environment in substantial amounts (addressed in Section 3.4), or in which hazardous levels of energy (e.g., EMR) are released. Types of activities that raise public safety concerns are those where members of the public are proximate or within the footprint of a potentially hazardous training activity. Training activities that pose no public safety concerns include: 1-4, 8, 13-24, 32-34, 36, 43, 44, 47, 54-58, 60-70, 72-74, 78 [Table 2-1], and N10 [Table 2-2]. Land detonations of small amounts of explosives in a controlled training environment on Navy property, where a substantial buffer exists between the training site and adjacent public areas (Activity 31 [Table 2-1]), are deemed not to constitute a risk to public safety.

#### 3.16.3.1 Approach to Analysis

Navy training activities are considered to have a significant impact on public health or safety if the general public is substantially endangered. Most of the training activities consist of individuals, vehicles, and equipment stationed at or moving within SSTC. Those activities that take place wholly within Navy-controlled areas have little potential to affect public safety in the absence of unauthorized public access. Some activities take place within SSTC and are designed to be wholly contained therein, but have some potential to project secondary effects outside of SSTC. Training and support activities that take place in joint military-public use areas or outside of SSTC, such as heavy equipment operations and aircraft and watercraft movements, have the most potential for impacts on public health and safety. For each training activity or group of similar activities, risks to the public are estimated—taking into consideration the Navy's safety procedures for range activities (Section 3.16.2.4).

#### 3.16.3.2 No Action Alternative

SSTC land training activities do not use live ammunition, with the exception of shotgun shells for breacher training (Activity 31, Table 2-1). Blasting caps are not capable of projecting hazardous effects off site because of their size, and because safety zones are been established specifically to control these effects. Flares, smoke grenades, and other small pyrotechnics used in training do not release projectiles or scatter fragments; thus they have no potential for effects in the absence of direct contact. SSTC training activities do not use high-power radar or other sources of intense EMR; also the area is checked for the public prior to use of lasers at SSTC. Routine training activities conducted within SSTC pose little risk to public health or safety outside of the training areas. Transportation and storage of energetic training materials in accordance with federal, state, and Navy requirements pose no substantial risk to public safety.

#### 3.16.3.2.1 Land Activities (Hazards Ashore)

Training activities at SSTC take place in well-defined locations under the close supervision of experienced military personnel. The same policies and procedures that protect training participants from injury or adverse health exposures would protect members of the public who were inadvertently present in the vicinity. However, trainers and exercise participants observe for the approach of nonparticipants, and respond accordingly.

Amphibious activities range from small boat raids to larger activities with marine vessels such as Amphibious Assault Vehicles (AAVs), Landing Craft Units (LCU), and Landing Craft, Air Cushion (LCACs). The largest exercises are Amphibious Raids, which took place only twice in the baseline year. These exercises involve up to 14 AAVs, plus LCUs and LCACs. Personnel performing the training observe for nonparticipants walking on the beach or swimming in the water to ensure that they do not enter the training area during these activities. Under the No Action Alternative, about 66 training events involving large amphibious craft will occur on SSTC-S beaches.

At SSTC-S, some potential exists for nonparticipants to be present on the beach or in the surf zone. Most of the 66 training events expected under the No Action Alternative will occur during daylight hours, and will not pose a safety risk to personnel in the area. Also, any nonparticipants will be clearly visible to exercise participants; hence the potential for a person to approach an amphibious vessel or vehicle unobserved is very low. Also, the training activities will occur primarily during business hours on weekdays, when public use of the beaches is at its lowest level. Thus, the potential for public safety to be at risk from amphibious exercises on SSTC-S is very low.

Heavy equipment activities on the beach, and cables stretched between bulldozers or anchor points and vessels or equipment, pose a risk of injury to untrained and unprotected individuals in the vicinity of these activities. Heavy equipment use is associated with Logistics Over the Shore training (Navy tactical task Action [NTA] 4.5.6). Except for Landing Craft Beaching (Activity 45, Table 2-1), these activities are conducted exclusively at SSTC-N. Personnel performing the training watch for nonparticipants walking on the beach or swimming in the water to ensure that they do not enter the training area; thus, no public safety concern is expected under the No Action Alternative.

#### 3.16.3.2.2 Air Activities (Hazards Aloft)

Air activities under the No Action Alternative are limited to helicopters, which will be involved in about 740 training activities per year (Activities 4, 6, 7, 12, 16, 25, 26, 28, 29, 30, 35, 37, and 64, Table 2-1). Helicopters supporting SSTC training operate out of the Naval Outlying Landing Field (NOLF) Imperial Beach or NASNI. Transit routes are over water, substantially reducing the risk to the general public in the event of an accident. Helicopters participate in the Mine Countermeasures, Amphibious Activities, NSW, Tactical Reconnaissance and Surveillance, and NSW Diving and Beach training. In the baseline year, SSTC training required about 400 helicopter sorties, or about one to two sorties per day. There have been no incidents involving aircraft during training at SSTC that have put the safety of the public at risk. Given this exemplary safety record, and the relatively low frequency and short duration of helicopter flights over public areas, aircraft activities associated with the No Action Alternative will not affect public safety.

#### 3.16.3.2.3 Water Activities (Hazards Afloat)

Watercraft are involved in all general categories of SSTC training. One safety concern for private vessels during Navy training activities in public waters is the potential for a collision with a Navy vessel or amphibious vehicle. Watercraft and amphibious vehicles transiting nearshore waters during their approaches to the beach avoid non-military vessels. Avoidance of nonparticipants, low frequency of activities, and close operational control serve to minimize the potential for interactions with nonparticipants, and to minimize the consequences of any interactions that do occur.

Small quantities of explosives are used for training in surface and underwater detonation in water areas accessible to the public. Seven training activities (5, 6, 7, 10, 11, 12, and 37, Table 2-1) require the use of explosive charges; a maximum Net Explosive Weight (NEW) of 20 pounds is used (Activity 11, Table 2-1). These types of training represent 105 underwater or surface detonations per year. Event participants will establish an appropriate exclusion zone for each event prior to detonation. Navy has found through modeling that an exclusion zone of 570 yards (for the largest charge used under all alternatives) protects divers and swimmers from the types and intensities of underwater detonations that occur during training activities on SSTC (NUWC 2009). Activities are not conducted if non-participants are observed in the exclusion zone. Thus, these activities will have no effect on public safety.

Underwater detonation packages could pose a hazard to the public if they were to be lost during a training exercise and not immediately recovered. The potential for such an incident to occur is low because (a) these items are carefully handled during training, (b) the Navy strictly accounts for all explosives under its control, and (c) the number of training events in which underwater detonations occur is small. If an underwater detonation package is lost during training, the Navy will immediately search for it, and most likely will recover it before the public comes in contact with it. Unrecovered packages will still pose little or no hazard to the public because they do not readily detonate, and they tend to sink and become buried in the bottom sediments or sand.

### 3.16.3.3 Alternative 1 (Preferred Alternative)

SSTC land training activities would not employ live ammunition, with the exception of shotgun shells for breacher training and small arms for training inside bunkers on SSTC-S. Blasting caps are not capable of projecting hazardous effects offsite because of their size, and because berms and buffer zones have been established specifically to control these effects. Flares, smoke grenades, and other small pyrotechnics used in training do not release projectiles or scatter fragments, and thus have no potential for effects in the absence of direct contact. SSTC training activities would not use high-power radar or other sources of intense electromagnetic radiation. Routine training activities conducted within SSTC would pose little risk to public health or safety outside of the training areas. Transportation and storage of energetic training materials in accordance with federal, state, and Navy requirements would pose no substantial risk to public safety.

#### 3.16.3.3.1 Land Activities (Hazards Ashore)

Under Alternative 1, the proximity of public areas to training activities and the potential for unauthorized nonparticipants to be in the vicinity of a training exercise would remain unchanged. Under Alternative 1, the number of land training activities would increase by about 23 percent (228 vs. 186). However, the Navy would continue to implement Range Control Coordination Procedures to avoid public safety issues. In addition, unauthorized access may decrease because the more frequent and visible use of beach training areas by military personnel could tend to discourage the public from routinely entering beach training areas.

#### 3.16.3.3.2 Air Activities (Hazards Aloft)

Under Alternative 1, helicopter sorties in support of SSTC training activities would increase to about 1,673 from 740 in the baseline tempo (Activities 4, 6, 7, 12, 16, 25, 26, 28, 29, 30, 35, 37, 64 [Table 2-1], N4, N5, N6, N7, and N8 [Table 2-2]), or by about 126 percent. The most intense helicopter use anticipated under Alternative 1 would be for the Amphibious Raid (NTA 1.5.4) training on SSTC-S, when up to eight aircraft would be in operation at once. Based upon the factors discussed for aircraft activities under the No Action Alternative, aircraft activities under Alternative 1 generally would have no effect on public safety.

New MCM training activities (N4-N7, Table 2-2) would require the exclusive use of ocean areas, so the potential for nonparticipants to be put at risk by these activities would be very low. Activity N5, Airborne Laser Mine Detection, would use a helicopter-mounted Light Detection and Ranging blue-green laser to detect, classify, and locate floating and near-surface mine shapes in shallow water. Given that this system would be used only in areas from which nonparticipants would be excluded and would be used in accordance with Navy standard operating procedures and safety protocols, the potential for this activity to have an effect on public safety would be extremely low.

#### 3.16.3.3.3 Water Activities (Hazards Afloat)

Under Alternative 1, the number of annual activities involving landings of large watercraft (e.g., LCACs, LCUs, AAVs) would increase to 143 from the 127 baseline tempo (Activities 5, 6, 7, 9, 11, 12, 25, 26, 27, 28, 29, 30, 35, 37, 38, 39, 40, 41, 42, 45, 46, 49, 51, 53, N1, Tables 2-1 and 2-2). The overall number of activities using vessels in training would increase, with the greatest increase in the use of Combat Rubber Raiding Craft and Boston whalers. Under Alternative 1, the most intense use of large, fast, powered vessels would be for the Amphibious Raid Activities (NTA 1.5.4) training to be held 18 times per year on SSTC-S, in which up to 25 small boats, landing craft, and amphibious vehicles would participate. The potential for an incident in nearshore waters involving watercraft engaged in training activities would be slightly greater than under the No Action Alternative.

The use of small quantities of explosives in water areas accessible to the public for training in surface and underwater detonation is another area of potential safety concern. Twelve training activities (Activities 5, 6, 7, 10, 11, 12, 37, N1, N3, N7, N9, and N11, Tables 2-1 and 2-2) require the use of explosive charges; a maximum NEW of 29 pounds would be used (Activity 11, Table 2-1). These types of training represent a total of 415 underwater or surface detonations per year. Event participants would establish an appropriate exclusion zone for each event, and would proceed with the detonation when the exclusion zone was determined to be clear of people. The potential for underwater detonation packages to be lost during a training activity would increase in proportion to the increase in the number of training activities, but still would be very low. Thus, these activities would have no effect on public safety.

### 3.16.3.4 Alternative 2

The only difference between Alternative 1 and 2 is that, under Alternative 2, all SSTC-N oceanside beach training areas would be available for Navy training, regardless of time of year. Under Alternative 2, the proposed change in access and availability to existing beach and inland training areas would not change current range control and coordination procedures. These procedures would continue to be implemented under Alternative 2. Under Alternative 2, risks to public safety would be similar to that under Alternative 1. Increased training and more visible use of Blue 2, Orange 1, and Orange 2 may further discourage unauthorized access.

## 3.16.4 Proposed Mitigation Measures

Mitigation measures for other resources that affect public health and safety (e.g. noise, hazardous materials and waste, water resources) would be implemented. Current measures in place to ensure that nonparticipants are not endangered by Navy actions would continue (Section 3.16.2.4). No additional mitigation measures are warranted.

## 3.16.5 Unavoidable Adverse Environmental Effects

There are no unavoidable adverse environmental effects to public health and safety as a result of implementation of the alternatives.

### 3.16.6 Summary of Effects

Table 3.16-2 summarizes the effects of and mitigation measures for the No Action Alternative, Alternative 1, and Alternative 2.

**Table 3.16-2: Summary of Effects**

| Alternative | Effects |
|---|---|
| **No Action Alternative** | • Routine training activities conducted within SSTC pose little risk to public health or safety outside of the training areas.<br>• Risks to the public from rotary-wing aircraft supporting SSTC training is minimal, based on past safety record, low number of flights, and over-water flight paths.<br>• Risks to the public from marine vessels supporting SSTC training and small craft participating in training are minimal based on past safety record and established right-of-way conventions and avoidance procedures. |
| **Alternative 1** | • On-site training activities would increase. The Navy would continue to implement Range Control Coordination Procedures to avoid public safety issues. Unauthorized access may decrease because more frequent and visible use of beach training areas by military units could discourage the public from entering beach training areas.<br>• Air support and marine vessel support would increase, but for the reasons noted under the No Action Alternative, public safety would be maintained. |
| **Alternative 2** | • Impacts would be similar to those under Alternative 1. Increased training and more visible use of Blue 2, Orange 1, and Orange 2 may further discourage unauthorized access. |
| **Mitigation Measures** | • Mitigation measures for other resources that affect public health and safety (e.g. noise, hazardous materials and waste, water resources) would be implemented. Current measures in place to ensure that nonparticipants are not endangered by Navy actions would continue: safety buffers for underwater detonations, existing guards or gates around many training areas, and monitoring for non-participants during training. |

# 4 Cumulative Impacts

# 4 CUMULATIVE IMPACTS

## 4.1 PRINCIPLES OF CUMULATIVE IMPACTS ANALYSIS

The approach taken to analyze cumulative impacts (or cumulative effects)[1] follows the objectives of National Environmental Policy Act (NEPA) of 1969, Council on Environmental Quality (CEQ) regulations, and CEQ guidance. CEQ regulations (40 Code of Federal Regulations [CFR] Parts 1500-1508) provide the implementing procedures for NEPA. The regulations define "cumulative effects" as:

> ". . . the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time." (40 CFR 1508.7)

CEQ provides guidance on cumulative impacts analysis in *Considering Cumulative Effects under the National Environmental Policy Act* (CEQ 1997). This guidance further identifies cumulative effects as those environmental effects resulting "from spatial and temporal crowding of environmental perturbations. The effects of human activities will accumulate when a second perturbation occurs at a site before the ecosystem can fully rebound from the effects of the first perturbation." Noting that environmental impacts result from a diversity of sources and processes, this CEQ guidance observes that "no universally accepted framework for cumulative effects analysis exists," while indicating that certain general principles have gained acceptance. One such principle provides that "cumulative effects analysis should be conducted within the context of resource, ecosystem, and community thresholds—levels of stress beyond which the desired condition degrades." Thus, "each resource, ecosystem, and human community must be analyzed in terms of its ability to accommodate additional effects, based on its own time and space parameters." Therefore, cumulative effects analysis normally will encompass geographic boundaries beyond the immediate area of the Proposed Action, and a time frame including past actions and foreseeable future actions, in order to capture these additional effects. Bounding the cumulative effects analysis is a complex undertaking, appropriately limited by practical considerations. Thus, CEQ guidelines observe, "[i]t is not practical to analyze cumulative effects of an action on the universe; the list of environmental effects must focus on those that are truly meaningful."

### 4.1.1 Identifying Geographical Boundaries for Cumulative Impacts Analysis

Geographic boundaries or Regions of Interest (ROI) for analyses of cumulative impacts in this Environmental Impact Statement (EIS) vary for different resources and environmental media. For air quality, the potentially affected air quality region is the appropriate boundary for assessment of cumulative impacts from releases of pollutants into the atmosphere. For terrestrial biological resources, the area in which Silver Strand Training Complex (SSTC) activities occur, or are proposed to occur, is the appropriate geographical area for assessing cumulative impacts. For wide-ranging or migratory wildlife, specifically marine mammals, sea turtles, and migratory birds, any impacts from the Proposed Action or alternatives might combine with impacts from other sources within the ranges of each population.

### 4.1.2 Past, Present, and Reasonably Foreseeable Future Actions

Identifiable effects of actions occurring in the past and present are analyzed along with reasonably foreseeable future actions to assess additive impacts of the Proposed Action. In general, the Navy need not list or analyze the effects of individual past actions; cumulative impacts analysis of past actions focus

[1] CEQ Regulations provide that the terms "cumulative impacts" and "cumulative effects" are synonymous (40 CFR § 1508.8[b]); the terms are used interchangeably.

on aggregate effects. Reasonably foreseeable future actions that may have impacts additive to the effects of the Proposed Action also are to be analyzed, and are listed in Section 4.2 (Table 4-1).

## 4.2 ACTIVITIES ANALYZED FOR CUMULATIVE IMPACTS

### 4.2.1 Specific Projects Analyzed

Projects in the SSTC EIS ROI (listed in Table 4-1) are considered on a resource-specific basis in the cumulative effects analysis. Other activities are addressed in Section 4.2.2.

**Table 4-1: Past, Present, and Planned Projects in the SSTC EIS ROI**

| Number | Project | Description | Status |
|---|---|---|---|
| 1. | Glorietta Bay Marina | Dredging of the marina and installation of new docks. | Planned |
| 2. | Sand Removal & Sand Relocation at Naval Radio Receiving Facility | Removal and relocation of excess sand along perimeter fence line on the southwest corner of the SSTC. | Ongoing |
| 3. | Naval Air Station, North Island (NASNI), Naval Base Coronado (NBC) Lodge Expansion | Demolition of four existing Navy Lodge buildings and several smaller structures and the construction of a lodge building and cottages to increase room capacity. Construction of recreation facilities, parking lots and road upgrades, retail shops, a restaurant, and landscaping and utility upgrades. | Ongoing (construction phase) |
| 4. | The Marina at Naval Amphibious Base Coronado, NBC | Erosion control, restoration of deteriorated marina facilities, and enhancement and expansion of existing recreational functions of the marina at NBC. | Ongoing |
| 5. | Sixth and Orange Drainage Improvements | The City of Coronado is planning the preparation of drainage studies and improvements for the Fourth and Alameda drainage basin and the Sixth and Orange drainage basin. | Ongoing (construction phase) |
| 6. | Traffic Tunnel Environmental Phase | A City of Coronado project study to determine costs and design of two side-by-side 1.4-mile traffic tunnels commencing east of Glorietta Boulevard and exiting west of Alameda Boulevard onto NASNI. | Project stopped due to citizen ballot measure |
| 7. | Coronado Cays Storm Drain Rehabilitation Phase III | Repair of storm drains in the Coronado Cays that show failed joint lines, non-storm related flow, and heavy debris and soil build up within the lines. | Past, Present, and Proposed |
| 8. | Beach Public Safety and Restrooms | Replacement of the Silver Strand State Beach Central Beach Lifeguard Tower and restroom construction. | Completed |
| 9. | Roadway Preventive Maintenance | Slurry seal of one-sixth of the City of Coronado's streets. Slurry seal is a thin mixture consisting of fine sand, water, and emulsified asphalt applied to asphalt. | Past, Present, and Proposed |
| 10. | Fiber Optic Cabling Connection Project | The City of Coronado plans an interconnection of the main sewer pump stations for monitoring purposes and future automated control. | Present |

**Table 4-1: Past, Present, and Planned Projects in the SSTC EIS ROI (Continued)**

| | | | |
|---|---|---|---|
| 11. | Wastewater Master Plan | A City of Coronado plan for sewer main replacement, rehabilitation of the Cays main pump station, and Margarita Avenue sewer main replacement. | Past |
| 12. | U.S. Navy Lighterage | Construction of a Waterfront Command and Control Facility for Amphibious Construction Battalion One facilities to support the introduction of the improved Navy Lighterage System at NBC. | Ongoing |
| 13. | Mobile Security Forces and Naval Special Clearance Team-One Pier and Boat Ramp | Provision of facilities for the co-location of two new commands at NASNI, the Mobile Security Forces and the Naval Special Clearance Team-One, including construction of a pier, boat ramp, and several buildings; paving; site improvements with security fencing and lighting, landscaping and irrigation; and a paved vehicle storage yard. | Planned |
| 14. | Dredging and Sand Replenishment Projects | Projects range from Regional Sediment Management Plans for regional scale management to specific dredging projects. The San Diego Bay maintenance dredging is currently conducted as well as future projects such as San Diego Association of Government's Regional Beach Sand Replenishment Project that is in planning stages for the City of Imperial Beach. Specific information on projects can be found on websites maintained by the projects' lead agencies, including the Army Corps of Engineers Los Angeles District. | Past, Present, and Planned |
| 15. | Seacoast Inn Project | Part of Imperial Beach redevelopment plan to increase investment to the downtown areas. Consists of the building of a 4-story, 78-room, 111-subterranean parking space hotel/condo structure. | Planned to begin in 2009 with 2010 completion |
| 16. | Imperial Beach Redevelopment Projects | Redevelopment projects for Palm and Carnation street ends, including sidewalk and street construction, sound and visual walls, landscaping, emergency vehicle access, pollution diversion system, public art, ramp installation, and direct beach access for emergency vehicles and individuals with disabilities. | Planned but unfunded |
| 17. | Development of Home Port Facilities for the Three NIMITZ-Class Aircraft Carriers in Support of the Pacific Fleet | Construction and operation of facilities and infrastructure needed to support the capacity to homeport three NIMITZ-class nuclear-powered aircraft carriers within the U.S. Pacific Fleet. | Completed |
| 18. | AIMS Cable Array Installation | A cable array to extend from a proposed building on NRRF inland, onto the beach, into the water on oceanside SSTC-S, and within the boat lanes. Being evaluated under the BRAC Ingleside EA, Phase II. | Completed |

**Table 4-1: Past, Present, and Planned Projects in the SSTC EIS ROI (Continued)**

| | | | |
|---|---|---|---|
| 19. | Camp Surf Improvements | Leased area held by the YMCA will undergo improvements to existing structures on the YMCA Camp Surf site within the SSTC-S fenced area. | Ongoing |
| 20. | USFWS Refuges Comprehensive Conservation Plan (CCP) | The CCP addresses topics of resource management, visitor use, refuge operations, and development in general terms. | Past |
| 21. | Final Environmental Impact Statement (FEIS) for the Introduction of the P-8A Multi-Mission Maritime Aircraft (MMA) into the U.S. Navy Fleet | This FEIS evaluates the environmental consequences associated with homebasing twelve P-8A Fleet squadrons and one Fleet Replacement Squadron at established maritime patrol home bases. The FEIS analyzes personnel transition, new construction and renovation of structures, and all airfield operations necessary to accommodate the basing of P-8A MMA. The P-8A is being introduced to replace the aging P-3C Orion aircraft. Currently, P-3C patrol squadrons have periodic detachments at NASNI. The Notice of Record of Decision was published in the Federal Register on January 2, 2009. | Completed |
| 22. | Current, Emerging, and Future Training Operations in the Southern California (SOCAL) Range Complex | Within the SOCAL Range Complex, continuation of training, an increase in training activities, force structure changes associated with introduction of new weapons systems, new classes of ships, and the introduction of new types of aircraft into the Fleet. | Present, Planned |
| 23. | Naval Base Coronado Small Arms Range | Installation of a small arms firing range at Naval Base Coronado. | Completed |
| 24. | MH-60 EA | The introduction of the MH-60S aircraft meets the Navy's need to support EOD MU-11 in their activities at SSTC. To implement the proposed action, the Navy must ensure that adequate hangar, training, maintenance and personnel support facilities are available to meet production and delivery schedules and to satisfy operational commitments. | Ongoing |

## 4.2.2 Other Activities

### 4.2.2.1 Commercial and Recreational Marine Traffic

The Port of San Diego is an important commercial cargo and cruise ship port. In 2005, cargo volume reached over 2,900,000 metric tons. Annually, approximately 400 commercial cargo vessels utilize port facilities (Economic Research Associates 2007). In 2006, San Diego recorded 219 cruise ship calls (619,000 passengers) (San Diego Unified Port District [SDUPD] 2007).

While the U.S. Coast Guard has indicated that there are no precise estimates for recreational or commercial fishing or boating activity in the area, it is estimated that San Diego Bay accommodates over 7,000 boat slips in several marinas (SDUPD 2007). According to statistical data maintained by the California Department of Fish and Game (CDFG), commercial fishing is not considered to constitute a significant nonmilitary use in the vicinity of NASNI (CDFG 2002); recreational fishing occurs on a limited scale in these waters.

#### 4.2.2.2 Activities Contributing to Ocean Pollution

Commercial and recreational vessels are potential sources of pollutants, including fuel or oil leaks and toxins from antifouling paints. These vessels constitute an environmental concern that has not been quantified. Sewage, sludge, blackwater, graywater, bilge water, plastics, and other trash components and waste materials are routinely discharged from vessels into coastal and ocean waters in Southern California. Polluted runoff, or non-point source pollution, is considered the major cause of impairment of California's ocean waters. Storm water runoff from coastal urban areas and beaches carries waste such as petroleum, plastics, and styrofoam into coastal waters. Sewer outfalls also are a source of ocean pollution in Southern California. The Tijuana River, located directly south of Imperial Beach, is a major source of pollution for Southern California beaches. Bacteria levels are measured routinely to determine the quality of water at recreational beaches, and as indicators of the possible presence of other harmful microorganisms.

#### 4.2.2.3 Activities Contributing to San Diego Bay Pollution

Due to the high density of commercial vessel traffic in San Diego Bay, commercial vessels are a potentially significant source of pollutants, including, fuel leaks, antifouling paint toxins, and illegal trash dumping. San Diego Bay also accommodates a large number of recreational boaters that potentially contribute pollutants through illegal dumping. Other sources of vessel-related pollution include naval boat activities, dumping by bayside industries, and San Diego Bay's numerous marinas. The high density of urban development on the eastern shore of San Diego Bay produces runoff which can contribute to concentrations of pollutants such as pesticides, household waste, and several other non-point source pollutants. Local streams and creeks that feed into San Diego Bay also augment contaminated sedimentary deposits and are a major source of coliform bacterial concentrations.

#### 4.2.2.4 Air Quality Emissions

In the California Air Resources Board (CARB) emission inventories by category (CARB 2008), the San Diego Air Basin (SDAB) includes emissions (Reactive Organic Gases [ROG], carbon monoxide [CO], oxides of nitrogen [$NO_X$]) and particulate matter less than 10 microns [$PM_{10}$]) from aircraft, ships, and commercial boats. Emission estimates are based on emissions from onshore (land) or nearshore (<3 nm from mean high tide line) activities. These emissions account for a small percentage of the overall air emissions budgets for the air basin. Emissions from marine vessels operating in offshore areas are not included in the State Implementation Plan (SIP) emissions budget and in air quality planning because they are assumed to have a negligible effect on the ambient air quality, and because reductions in emissions from these sources would not generate a great improvement in the ambient air quality. The SIP emissions inventory also includes emissions from motor vehicles and construction activities within the SDAB.

## 4.3 CUMULATIVE IMPACT ANALYSIS

### 4.3.1 Land Use and Recreation

The Proposed Action would include activities that are consistent with long-established military land uses. Activities are consistent with established land uses within and outside of SSTC and NASNI boundaries. Cumulative effects associated with increased noise levels are addressed in Section 4.3.6 (Acoustic Environment [Terrestrial]). At SSTC-South (SSTC-S), some activities require public access to be restricted in one or more beach training lanes below the high tide line for public safety or mission security purposes (Section 3.1.2.2.2). If public access restrictions are required, they would typically last one to four hours; however, on average, these activities could require the beach to be closed for about 2 hours at a time; even then, the closures would only occur in one of the beach lanes, allowing public access to other public areas of the beach.

Cumulative impacts on land use would consist of the effects of the Proposed Action in combination with other projects, actions, and processes that would result in increased noise levels or restrict public access to beaches. None of the projects identified as past, present, or planned in the SSTC EIS ROI (Table 4-1) involve permanent public access restrictions to the beach. In addition, any changes to land use as a result of implementation of Navy projects would be compatible with existing military uses of the installation. Therefore, cumulative effects related to land use due to implementation of the Proposed Action in combination with past, present, or planned projects in the ROI would be minimal.

### 4.3.2 Geology and Soils

Cumulative impacts on marine geology and sediments would consist of the aggregate effects of the Proposed Action and other projects, actions, and processes that deposit sediment or debris, alter bathymetry, or disturb ocean bottom sediments. Relevant effects would include debris contributions from recreational fishing, dredging and sand replenishment projects, coastal development, and other ocean industries (Projects 1, 3, 4, 6, 13, 14, 15, 16, 18, 22, and 23 in Table 4-1). The effects of these activities are known only in a very general sense. The ROI for the Proposed Action with regard to cumulative impacts to geology and soils is the Silver Strand peninsula and adjacent areas of San Diego Bay and the Pacific Ocean.

The Proposed Action would affect marine geology and sediments by creating craters in bottom sediments and depositing training debris on the ocean bottom. In addition, previously disturbed surface soils in existing training areas on SSTC would be further disturbed. The Proposed Action is expected to increase the level of soil disturbance in both beach and inland portions of SSTC (Section 3.2). It also is expected to disturb small areas of benthic habitat associated with underwater detonations required for training, increases in erosion or off-site sediment transport, and changes in topography. The Proposed Action would expend small amounts of training materials (e.g., flare residues) that would not be recovered.

Dredging mostly occurs in nearshore Pacific Ocean areas, harbors, and San Diego Bay. Disposal areas for dredged materials, other than sand for beach replenishment projects, are located farther offshore in deep waters. These projects temporarily alter ocean and San Diego Bay bottom contours, which tend to reestablish themselves (mounded materials being dispersed and dredged basins being filled in) over time. This activity is closely regulated by the U.S. Army Corps of Engineers, in order to ensure that major alterations of bathymetry have no significant adverse environmental effects. Replenishment of sandy beaches on the Silver Strand would have beneficial effects. The Proposed Action would not affect the quantities of materials dredged or deposited in the ROI in the future.

Existing coastal development generates large amounts of surface runoff into the San Diego Bay and ocean during winter storms; this runoff contains substantial quantities of fine sediments that are deposited on the bottom. Construction of the coastal development projects proposed for the ROI (see Table 4-1) would denude and disturb surface soils, possibly generating additional sediments that would be conveyed to the San Diego Bay or ocean. These projects also would increase the aggregate area of paved surfaces on the Silver Strand, thus increasing incrementally the volume of runoff generated during storms. Combined with the Proposed Action, which also would incrementally increase sediment transport into marine areas, the quantities of sediments deposited in these nearshore areas would increase by an insignificant degree.

Cumulative impacts on terrestrial SSTC geology and soils would consist of the combined effects of the Proposed Action and other Navy actions at SSTC that alter the local topography or disturb surface soils. Periodic removal of excess sand under the Naval Radio Receiving Facility (NRRF) Sand Removal and Relocation (Project 2 in Table 4-1) would serve to maintain the existing topography along the southwestern edge of SSTC-S. New construction (Projects 3, 13, 15, 16, 19, and 21 in Table 4-1) would remove ground cover, disturb surface soils, alter surface drainage patterns, and, by increasing the ground coverage of impervious surfaces, increase the volume of surface water flows during storms. These new activities, along with elements of the Proposed Action (see Section 3.2) would contribute locally and incrementally to increased sediment transport and deposition; however, the cumulative effects on local beach erosion still would be negligible relative to the scale of the natural processes that occur in the ROI (e.g., northward transport of sediments by longshore currents, as discussed in Section 3.2). Best Management Practices for soil-disturbing activities, such as drainage improvements, and road improvements would be implemented for any construction activity. Therefore, the cumulative effects on geology and soils from implementation of the Proposed Action in combination with past, present, or planned projects in the ROI would be minimal.

### 4.3.3 Air Quality

Cumulative impacts on air quality would consist of the effects of the Proposed Action in combination with other projects, actions, and processes that would result in increases in emissions of air pollutants. The ROI for assessing cumulative impacts to air quality is the SDAB.

Emissions estimates for the Proposed Action would account for a small percentage of the overall air emissions budgets for the SDAB; these estimates do not include marine vessel emissions for vessels operating in surrounding air basins or outside of U.S. territorial waters. These emissions are not included in the SIP emissions budget and in air quality planning because they are assumed to have a negligible effect on the ambient air quality; and because reductions in emissions from these sources would not generate a great improvement in the ambient air quality.

The Proposed Action would be required to conform to the applicable SIP, which would require a demonstration that the Proposed Action would not result in a cumulatively significant impact for nonattainment pollutants. As discussed in Section 3.3.5, emissions associated with the Proposed Action are below the *de minimis* levels for the SDAB, and are within the SIP emissions budget. The analysis of air pollutant emissions to determine conformance to ambient air quality standards is a regional analysis that, by nature, is cumulative. The SIP and 2010 emissions inventory consider foreseeable projects (including those on the cumulative list) and cumulative growth. Section 3.3, Air Quality, demonstrates conformance with the SIP.

Activities affecting air quality in the region include mobile sources such as automobiles and aircraft, and stationary sources such as power generating stations, manufacturing operations, and other industry. In CARB emission inventories by category (CARB 2010), SDAB includes emissions from aircraft, ships, and commercial boats. These emissions are included in the mobile source category. Traditionally, the emission estimates are based on emissions from onshore or nearshore operations. The emission inventory for the SDAB also includes emissions from motor vehicles and construction activities.

The background ambient air quality data presented in Table 4-2 includes contributions from those projects listed in Table 4-1 that are past and ongoing projects. As indicated in Table 4-2, the data in the SDAB shows that ambient pollutant concentrations are below the required National Ambient Air Quality Standards (NAAQS) and California Ambient Air Quality Standards (CAAQS) for most criteria pollutants. Currently, the air basin is considered a maintenance area for CO and a maintenance plan has been adopted. The SDAB is also considered a basic nonattainment area for the NAAQS for ozone ($O_3$), and an *Eight-Hour Ozone Attainment Plan for San Diego County* has been adopted as the SDAB portion of the California SIP. The SDAB is in attainment for the NAAQS for all other criteria pollutants. The SDAB is currently classified as a nonattainment area under the CAAQS for $O_3$, $PM_{10}$, and $PM_{2.5}$. However, cumulative impacts on air quality would be less than significant due to the minimal increase expected to be attributable to the Proposed Action and programs in the air basin designated to reduce emissions over time. Those projects listed in Table 4-1 that are planned projects for the future would result in emissions associated with construction and motor vehicles. Growth in these activities has been accounted for in the SIP, and emissions from the projects listed in Table 4-1 would be minor. Therefore, the cumulative effects on air quality from implementation of the Proposed Action in combination with past, present, or planned projects and other activities would be minimal.

**Table 4-2: Background Ambient Air Quality – Chula Vista Monitoring Station**

| Pollutant | Averaging Time | 2004[1] | 2005[1] | 2006[1] | 2007[1] | 2008[1] | CAAQS[1] | NAAQS[1] |
|---|---|---|---|---|---|---|---|---|
| $O_3$ | 8 hour | 0.087 | 0.081 | 0.068 | 0.087 | 0.083 | 0.070 | 0.075 |
| | 1 hour | 0.097 | 0.093 | 0.084 | 0.105 | 0.107 | 0.09 | - |
| $PM_{10}$[2] | Annual Arithmetic Mean | 25.8 µg/m³ | 26.5 µg/m³ | 26.3 µg/m³ | 25.5 µg/m³ | 26.2 µg/m³ | 20 µg/m³ | 50 µg/m³ |
| | 24 hour | 44 µg/m³ | 52 µg/m³ | 52 µg/m³ | 57 µg/m³ | 53 µg/m³ | 50 µg/m³ | 150 µg/m³ |
| $PM_{2.5}$ | Annual Arithmetic Mean | 12.2 µg/m³ | 11.8 µg/m³ | 11.2 µg/m³ | 12.5 µg/m³ | 12.3 µg/m³ | 12 µg/m³ | 15 µg/m³ |
| | 24 hour | 32.7 µg/m³ | 34.3 µg/m³ | 30.2 µg/m³ | 77.8 µg/m³ | 32.9 µg/m³ | - | 35 µg/m³ |
| $NO_2$ | Annual | 0.016 | 0.016 | 0.017 | 0.015 | 0.015 | - | 0.053 |
| | 1 hour | 0.072 | 0.071 | 0.074 | 0.082 | 0.072 | 0.25 | - |
| CO | 8 hour | 2.48 | 2.13 | 2.20 | 2.2 | 1.9 | 9.0 | 9 |
| | 1 hour | 3.9 | 2.8 | 2.7 | 3.1 | 2.0 | 20 | 35 |
| $SO_2$ | Annual | 0.003 | 0.003 | 0.003 | 0.002 | 0.002 | - | 0.030 |
| | 24 hour | 0.016 | 0.005 | 0.006 | 0.004 | 0.004 | 0.04 | 0.14 |
| | 3 hour[3] | 0.021 | 0.009 | 0.013 | 0.007 | 0.005 | - | 0.5 |
| | 1 hour | 0.042 | 0.016 | 0.017 | 0.012 | 0.007 | 0.25 | - |

[1]Concentrations in ppm unless otherwise indicated
[2]California averages reported for $PM_{10}$
[3]Secondary NAAQS
"–"= not available from current website data
Source: www.arb.ca.gov (all pollutants except 1-hour CO and 1-hour and 3-hour $SO_2$)
www.epa.gov/air/data/monvals.html (1-hour CO and 1-hour and 3-hour $SO_2$)

#### 4.3.3.1 Global Climate Change

The increase in operational tempo, consisting of specific activities listed in Table 2-1, along with regional growth of urban areas and regional increases in recreational visitors, would incrementally increase regional emissions of $CO_2$ and other green house gases (GHG). Scientists are in general agreement that the Earth's climate is gradually changing, and that change is due—at least in part—to emissions of $CO_2$ and other GHG from man-made sources. The anticipated magnitude of global climate change is such that a significant cumulative impact on global climate exists.

Executive Order (EO) 13514, *Federal Leadership in Environmental, Energy, and Economic Performance*, was signed by President Obama on October 5, 2009. EO 13514 defines three scopes of emissions, which include the following: scope 1: direct greenhouse gas (GHG) emissions from sources that are owned or controlled by the Federal agency; scope 2: direct greenhouse gas emissions resulting from the generation of electricity, heat, or steam purchased by a Federal agency; and scope 3: greenhouse gas emissions from sources not owned or directly controlled by a Federal agency but related to agency activities such as vendor supply chains, delivery services, and employee travel and commuting. The

Department of the Navy will be subject to the requirements of EO 13514. Although the new EO 13514 for the first time calls for GHG emission reductions from federal agencies, the exact amount of GHG reductions and the required Strategic Sustainability Performance Plan to achieve those reductions is still under development and therefore not included in the analysis for this document.

Table 4-3 summarizes the annual GHG emissions associated with the No Action Alternative in comparison with Alternatives 1 and 2. These data show the increase in annual $CO_2$-equivalent ($CO_2e$) emissions estimated for the Preferred Alternative (60,554 metric tons) and the $CO_2e$ emissions generated from all sources in the U.S. in 2006 (7,054 million metric tons) (USEPA 2009). Therefore, $CO_2e$ emissions associated with the preferred alternative would amount to approximately 0.00086 percent of the total $CO_2e$ emissions generated by the U.S. Under any of the alternatives, cumulative impacts to global climate change would be minimal.

**Table 4-3: Greenhouse Gas Emissions**

| | Emissions (tons/year)[1] | | | |
|---|---|---|---|---|
| **Emission Source** | **CO2** | **CH4** | **N2O** | **CO2e** |
| **No Action Alternative** | | | | |
| Aircraft | 4,635 | 0.3 | 0.2 | 4,709 |
| Surface Ships | 57,125 | 4.2 | 1.2 | 57,666 |
| Ordnance | 0.3 | - | - | 0.3 |
| Ground Vehicles/TSE | 2,785 | 2.4 | 2.2 | 3,509 |
| **Total** | **64,545** | **6.9** | **3.6** | **65,884** |
| | | | | |
| **Alternatives 1 and 2** | | | | |
| Aircraft | 39,543 | 1.1 | 1.3 | 39,964 |
| Surface Ships | 75,347 | 5.5 | 1.9 | 76,061 |
| Ordnance | 0.4 | - | - | 0.4 |
| Ground Vehicles/TSE | 9,481 | 3.5 | 2.8 | 10,413 |
| **Total** | **124,371** | **10.1** | **6.0** | **126,438** |
| | | | | |
| **Alternatives 1 and 2 Increases over Baseline** | **59,826** | **3.2** | **2.4** | **60,554** |
| U.S. 2006 Baseline Emissions ($10^6$ metric tons) [2] | | | | 7,054.2 |
| Proposed Emissions as a % of U.S. Emissions | | | | 0.00086 |

*Notes:*

1 $CO_2e = (CO_2 * 1) + (CH_4 * 21) + (N_2O * 310)$ (GWPs from California Climate Action Registry General Reporting Protocol, Version 3.1, January 2009).

2 USEPA 2009.

Although the proposed action would not contribute substantially to cumulative impacts associated with global climate change, this important topic warrants discussion of DoN leadership in broad-based programs to reduce energy consumption and shift to renewable and alternative fuels, thereby reducing emissions of carbon dioxide and other greenhouse gases.

The Secretary of the Navy has established several goals for reducing the Navy’s consumption of fossil fuels:

- Mandate that energy usage, efficiency, life-cycle costs and other such factors be part of the Navy's decision when acquiring new equipment or systems, as well as vendors' efficiency or energy policies.

- Cut petroleum use by half in the Navy's fleet of commercial vehicles by 2015, by phasing in new hybrid trucks to replace older ones.

- Procure half the power at Navy shore installations from alternative energy sources—including wind or solar—by 2020 and, where possible, supply energy back to the grid, as the Navy does today at Naval Air Weapons Station China Lake, California.

- Reach the point that half the energy used throughout the Navy, including in ships, aircraft, vehicles and shore stations, comes from alternative fuel or alternative sources by 2020. Today that percentage is about 17 percent.

These examples illustrate the leadership role that the Navy has in achieving energy reductions that will contribute to the national effort to mitigate global climate change.

### 4.3.4 Hazardous Materials and Wastes

Cumulative impacts on hazardous materials would consist of the effects of the Proposed Action and other proposed projects, actions, and processes in the ROI that would use large quantities of hazardous materials, or that otherwise affect the hazardous materials management system. The ROI for hazardous materials is the Silver Strand peninsula and adjacent San Diego Bay and nearshore Pacific Ocean waters, all of which share local hazardous waste recycling and treatment, storage, and disposal (TSD) facilities and regional transportation networks that link the region to more distant TSD facilities.

The Proposed Action would increase releases into the environment of hazardous materials (see Section 3.4). However, the Navy’s existing hazardous materials and hazardous wastes management systems—responsible for safely storing and transporting these materials—would be able to accommodate the anticipated increases in throughput and would have no adverse effects.

The primary impact of hazardous materials use in the marine and terrestrial environment in the ROI would be an increase in the amounts of munitions, petroleum products, or other chemicals that are released. Hazardous materials settling out of the water column would contribute to contamination of ocean bottom sediments. Activities resulting in this contamination would include releases of hazardous constituents from fishing vessels or other ocean vessels, wastewater treatment plant outfalls, and non-point source pollution from terrestrial sources.

Hazardous materials would accumulate differently within San Diego Bay and in the Pacific Ocean because of differences in their circulation and currents. Hazardous materials released from sources in the eastern and southern portions of San Diego Bay would be concentrated by a long residence time (i.e., the amount of time that pollutants remain in a contained body of water). High to medium residence times of contaminants would contribute to further degradation of the San Diego Bay’s water and sediment quality. Hazardous materials released in western and northern portions of San Diego Bay have much shorter average residence times; shorter residence times are due to the proximity of open-ocean in the northern portion of the Bay and circulation patterns in other areas of the Bay. Hazardous constituents are eventually either incorporated into bottom sediments or flushed out of the San Diego Bay into the ocean by tidal exchanges. The quality of San Diego Bay bottom sediments has improved in recent years, indicating that recent levels of hazardous materials discharges are generally not resulting in adverse effects. The estimated quantities of hazardous materials from the Proposed Action (Sections 3.4.2.3 and 3.4.2.4), in combination with those anticipated from other reasonably foreseeable future projects and activities in the ROI, are not expected to alter that trend.

Commercial ocean industries, such as fishing and ocean transport, are dispersed over broad areas of the Pacific Ocean. Small-scale deposits of trash and debris from these activities are quickly degraded and buried in ocean bottom sediments. In combination with small-scale deposition of debris from the Proposed Action, the cumulative effect would be a low-density of deposited materials in heavily used areas and a very low density in lesser used areas. There is no central point of contaminant discharge, but the intensity of ocean uses, and correspondingly the density of hazardous materials discharges, declines with increasing distance from the coast. Discharges of hazardous constituents from non-point source runoff and treatment plant outfalls contribute contaminants to the area, mostly affecting the waters within three nautical miles of the coast. Ocean currents and sediment transport processes disperse the released materials over a much larger area. Overall, the quality of Pacific Ocean waters and bottom sediments offshore of Southern California are relatively high, indicating that current releases of hazardous materials are not causing adverse effects. Accidental release or spill of hazardous materials associated with the Proposed Action, along with those of other reasonably foreseeable future projects and activities in the ROI, would not substantially alter the quantities of these materials being discharged, and thus would not affect resources in the ROI.

Hazardous materials used on land by non-Navy activities in the vicinity of SSTC consist of fuels and other petroleum products to include paint, adhesives, glues, and other coatings, as well as other materials used in construction projects (see Table 4-1). Some hazardous materials could be stored in bulk on construction sites. Use of these materials is closely regulated by local, state, and federal agencies, and off-site release of substantial quantities of these items is rare. The overall risk of a substantial release of such materials from the Proposed Action or other projects is low.

Hazardous wastes generated aboard vessels engaged in training activities under the Proposed Action would offload those wastes to Navy shore facilities, where they would become part of the overall hazardous waste stream managed aboard Naval Base Coronado. Hazardous waste generated during terrestrial SSTC training activities under the Proposed Action also would be managed as part of the overall hazardous waste stream aboard Naval Amphibious Base (NAB) Coronado. Increased levels of training would result in increased throughput of hazardous wastes, but likely would not require additional storage, transport, or disposal facilities ashore for these materials. The Navy's hazardous waste management system and procedures are adequate to accommodate an increase in hazardous waste volumes. Other hazardous waste generators in the region, along with the Navy, would require the services of hazardous waste transporters and treatment, storage, and disposal facilities. While the costs for hazardous waste transport, treatment, storage, and disposal could increase in response to increased cumulative demand, the hazardous waste management industry in the region has sufficient physical capacity to respond to this increased demand.

Therefore, the cumulative effects of hazardous materials use and hazardous waste generation from the Proposed Action and other reasonably foreseeable future projects on environmental resources in the ROI and on the regional hazardous wastes treatment, storage, and disposal infrastructure would be minimal.

### 4.3.5 Water Resources

Cumulative impacts on water resources would consist of the effects of the Proposed Action when added to other projects, actions, and processes that affect surface or groundwater hydrology, or consistency with the *Basin Plan* and the National Ambient Water Quality Criteria (NAWQC), those that release potential water pollutants or otherwise result in long-term degradation of marine, surface, or groundwater quality, and those that have substantial effects on public uses of state or federal waters. The ROI for water resources with regard to assessment of cumulative impacts consists of the Silver Strand peninsula and adjacent portions of San Diego Bay and the Pacific Ocean.

Effects from the Proposed Action on marine, surface, or groundwater quality is discussed in Section 3.5, Water Resources. The Proposed Action would be consistent with the *Basin Plan* and with the NAWQC. Releases of potential water contaminants from training activities would be minimal, and no long-term degradation of water quality would occur.

The Proposed Action could release water pollutants into the marine environment, directly or via surface flows to the marine environment. Cumulative impacts on ocean water quality would consist of the effects of the Proposed Action along with other industrial, commercial, and municipal sources of water pollution in San Diego Bay and offshore. The effects of these activities on the SSTC ROI are frequently monitored, but the individual effects are not well known. The Tijuana River discharge has become a problem for local beaches and ocean water quality because the local currents along Imperial Beach and Coronado cause contaminated waters to flow north from the international boundary, resulting in frequent beach closures from contamination. In addition to these effects, the San Diego Bay and Pacific Ocean waters continue to be affected by urban storm water runoff through non-point source pollution of roads, parking areas, and residential drain pipes that flush to the sea.

Cumulative impacts on terrestrial SSTC water quality would consist of the aggregate effects of the Proposed Action and other military and civilian projects and activities on and adjacent to SSTC (see Table 4-1). Because of a relatively high water table in the area, the use of pesticides, leaks and spills from motor vehicles, seepage from sewer lines, and other pollutants, the water quality is affected by various sources in the area. Navy training activities would result in materials expended in the water that are considered pollutants. However, according to Section 3.5, federal and state standards such as those presented in the Basin Plan are not exceeded.

### 4.3.6 Acoustic Environment (Terrestrial)

Cumulative impacts on the acoustical environment would consist of the effects of the Proposed Action when added to other projects, actions, and processes that would result in an increase in intrusive noise sources, a substantial long-term increase in average ambient noise levels, or a substantial increase in the number of impulsive sound events. The ROI for the acoustical environment consists of the Silver Strand peninsula, San Diego Bay and ocean training areas, and adjacent public areas.

Under the Proposed Action, training at SSTC would result in an increase in intrusive noise events, such as aircraft, vehicle/vessel pass-bys, and personnel activity but hourly sound levels would not generally be affected. Activities associated with the Proposed Action could occur simultaneously (e.g., Elevated Causeway activities and Hellweek) and could produce a cumulative effect on intrusive noise. However, loud activities would rarely occur at the same time or within close proximity to each other. Therefore, cumulative effects from these increases in noise levels would be minimal.

The Silver Strand is home to two naval air installations, Naval Air Station North Island (NASNI) and Naval Outlying Landing Field Imperial Beach (NOLF-IB). Fourteen squadrons of helicopters based at NASNI, operate out of 13 helipads. NASNI helicopter squadrons train primarily at NOLF-IB. NOLF-IB has two runways (9 and 27) and five helipads available for touch-and-go operations. In 2003, NOLF-IB supported approximately 250,000 annual operations with 1,000 peak-day operations. Sikorsky SH-60 aircraft accounted for 87 percent of annual operations and touch-and-go operations accounted for 87 percent of annual operations (County of San Diego 2005). Helicopters flying in and out of NOLF-IB and between NASNI and NOLF-IB (via north-south routes along San Diego Bay or the Pacific Ocean) for training generate several hundred helicopter flights per day. This helicopter traffic contributes substantially to the background noise level in the vicinity of SSTC.

Several local construction projects (Projects 2, 3, 6, 13, 15-18, and 24 in Table 4-1) would generate short-term intrusive noise. Construction of the Mobile Security facilities and Navy Lodge Expansion would generate construction noise for short periods on NASNI, and construction of a new traffic tunnel could generate construction noise along the San Diego Bay side of NASNI and SSTC-North (SSTC-N). Construction along Palm Avenue in Imperial Beach in combination with redevelopment would raise the background noise level, with various types of construction equipment and activities generating intermittent periods of intrusive noise and occasional impulse noise events. Periodic removal of excess sand along the SSTC-S fenceline will continue to generate occasional construction-type noise.

Construction of higher density residential and commercial facilities in the area, especially redevelopment of the Palm Avenue area of Imperial Beach, could result in substantially increased weekday traffic volumes on local roads, most notably State Route 75. Construction of new transportation corridors, such as the proposed tunnel connecting the northern portion of Coronado Bridge and NBC, could encourage more vehicular traffic on the peninsula, especially weekend visitors to recreational facilities such as Silver Strand State Beach. Traffic volume increases on major roads would be insufficient to substantially affect long-term background noise levels. Therefore, cumulative effects of traffic noise in the ROI from the Proposed Action, and in combination with other proposed new sources of vehicular traffic would be minimal.

In summary, the Proposed Action, along with other anticipated projects and activities, could result in minor increases in intrusive noise, traffic noise, and marine vessel noise that would incrementally degrade the acoustical environment of the ROI, but cumulative effects would be minimal.

### 4.3.7 Marine Biological Resources

Cumulative impacts on marine plants, algae, and invertebrates could result from the effects of the Proposed Action in conjunction with other past and future projects, actions, and processes that occur collectively and over a period of time. The ROI for potential cumulative effects varies widely among the various marine organisms. Marine plants and macroalgae are sedentary, attaching to substrate and growing where physical and chemical conditions are suitable, including light transmissivity, water and sediment quality, and substrate conditions such as grain size (e.g., sand versus silt or cobble). Invertebrate communities may be localized in their life cycle, never moving more than a few feet through generations (such as benthic infauna). In contrast, macroinvertebrates such as the California spiny lobster may have the ability to move in and out of San Diego Bay and the nearshore coastal waters of the Southern California Bight (SCB).

Cumulative impacts on marine plants and invertebrates would include release of munitions, petroleum products, and other chemicals into the water, introduction of debris into the water column and onto the sea floor, mortality and injury of marine organisms near the detonation or impact point of ordnance or explosives, and destruction of eelgrass or other habitat or substrate modification by foot or propeller wash within the activity areas. These impacts could in turn indirectly affect the foraging activities of fish, birds, and marine mammals in and around the SSTC.

Contributory activities from the projects listed within Table 4-1 can be categorized into sources of potential impact such as vessel activity, dredging, and harvesting of macroinvertebrates. Projects listed within Table 4-1 (e.g. Projects 1, 4, 7, 12, 13, and 14-18) that involve dredging or shoreline development temporarily disturb invertebrates and modify their habitat within a localized area. Changes to substrate from dredging and shoreline modifications that do not require mitigation would also not be sufficient to affect individual populations or productivity to a measurable degree. These changes would result in minimal disturbance of sandy bottom habitat and increased turbidity from amphibious landings and underwater demolitions. The areas of highest abundance and diversity for marine invertebrates such as mudflats, salt ponds, and salt marsh are avoided under the Proposed Action and other proposed activities in Table 4-1.

Vessel activity from other naval activities, commercial traffic, and private pleasure craft have steadily increased for decades and are not considered to adversely affect marine plants and invertebrates or their habitat. Commercial and recreational harvesting of invertebrates typically targets specific species (such as California spiny lobster or sea urchins) within the ROI and are managed by CDFG and National Marine Fisheries Service (NMFS). The level of mortality within San Diego Bay and adjacent nearshore waters attributed to harvesting activities is minimal due to regulations that permit recreational versus commercial harvest.

Therefore, cumulative effects related to marine plants and invertebrates due to implementation of the Proposed Action in conjunction with past, present, or planned projects in the ROI would be minimal.

### 4.3.8 Fish

Cumulative impacts on fish would consist of the effects of the Proposed Action in combination with other projects, actions, and processes that would result in an incremental increase in fish mortality, disturbance, and habitat modification within San Diego Bay and the adjacent coastal nearshore waters. Contributory activities such as vessel activity, in-water development (e.g., dredging), and fishing are potential sources of impact. The ROI for potential cumulative effects to fish includes San Diego Bay and coastal nearshore waters of Southern California. Fish within the ROI range from resident to migratory species that utilize the ROI to various degrees, both in time and space.

Potential effects to fish from the Proposed Action include mortality, injury, disturbance, and habitat modification. Injury and mortality can occur from physical and acoustic impacts associated with activities such as pile driving and underwater detonations, while behavioral modification can be associated with vessel traffic and other sound sources.

Vessel activity from naval activities, commercial traffic, and private pleasure craft have steadily increased for decades, and are not considered to adversely impact fish or their habitat. Other sound sources that are of major concern to fish and fisheries include strong underwater shock pulses that can cause physical damage to fish, and underwater noise that could affect their biology or catchability by fishermen. Naval training activities coupled with sources from commercial and recreational activities would not create a considerable impact.

Habitat modification can occur from naval vessel traffic, primarily beach landings, underwater detonations, and in-water construction associated with several training activities. However, impacts are reduced as training is limited to specific areas, to avoid sensitive or special aquatic sites. Projects that involve dredging or shoreline development (1, 4, 5, 13, 14, 17, and 18 in Table 4-1) can temporarily disturb fish and modify fish habitat within a localized area. Changes to fish habitat from dredging and shoreline modification not requiring mitigation would not be sufficient to affect individual fish populations or productivity to a measurable degree.

Commercial and recreational fishing target specific fish species within the ROI, and are managed by CDFG and the NMFS. Potential impacts of commercial fishing include overfishing of targeted species and bycatch, both of which negatively affect fish stocks; recreational fishing also poses a threat because of the large number of participants and the intense, concentrated use of specific habitats. However, increased regulation and management have led to population increases of several species (e.g., white sea bass, California halibut) near San Diego Bay and the ROI.

Given the transient nature of the training exercises and the minor, localized potential effects, there would not be incremental or synergistic impacts from present or reasonably foreseeable future uses of the SSTC, and the overall effect on fish stocks would be negligible compared to the impact of commercial and recreational fishing. Implementation of protective measures designed to avoid long-term impacts would further protect marine life and the environment. Therefore, cumulative effects related to fish as a result of implementation of the Proposed Action in combination with past, present, or planned projects in the ROI would be minimal.

### 4.3.9 Marine Mammals

Cumulative impacts on marine mammals would consist of the effects of the Proposed Action in combination with other projects, actions, and processes that would result in an incremental increase in injury or disturbance within San Diego Bay and the adjacent coastal nearshore waters. Contributory activities can be categorized into vessel activity, fishing, shoreline development, and acoustic disturbance as sources of potential impact. The ROI for potential cumulative effects to marine mammals includes San Diego Bay and coastal nearshore waters of Southern California.

Potential cumulative impacts of Navy training activities conducted in the SSTC on marine mammals would result primarily from possible commercial, recreational, and military ship strikes, underwater detonation, and pile driving effects within the training areas. Injury and disturbance of marine mammals and modification of habitat that could affect marine mammal foraging are based on physical and acoustic impacts of vessel activity, pile driving, and explosives within the area the individual actions encompass, and the value and type of habitat known to occur within the specific footprint.

Ship strikes, or ship collisions with whales, are a recognized source of whale mortality worldwide (Laist et al., 2001; Geraci and Lounsbury, 2005; de Stephanis and Urquiola, 2006). All types of ships can hit whales, with animals usually either seen too late, not observed until the collision occurs, or not detected. An animal at the surface could be struck directly by a vessel, a surfacing animal could hit the bottom of a vessel, or an animal just below the surface could be cut by a vessel's propeller. The severity of injuries typically depends on the size and speed of the vessel and the size of the animal (Knowlton and Kraus, 2001; Laist et al., 2001; Vanderlaan and Taggart, 2007). The ability of a ship to avoid or detect a collision depends on a variety of factors, including environmental conditions, ship design, size, and manning. A review of recent reports on ship strikes provides some insight regarding the types of whales, locations, and vessels involved, but review also reveals significant gaps in the data. The Large Whale Ship Strike Database provides a summary of the 292 worldwide confirmed or possible whale/ship collisions from 1975 through 2002 (Jenson and Silber 2003). The report notes that the database represents a minimum number of collisions, because the vast majority probably goes undetected or unreported.

The growth in commercial ports and associated commercial vessel traffic is a result of the globalization in trade. The Final Report of the National Oceanic and Atmospheric Administration (NOAA) International Symposium on Shipping Noise and Marine Mammals: A Forum for Science, Management, and Technology stated that the worldwide commercial fleet has grown from approximately 30,000 vessels in 1950 to over 85,000 vessels in 1998 (National Research Council, 2003; Southall, 2005). It is unknown how international shipping volumes and densities will continue to grow. However, current statistics support the prediction that the international shipping fleet will continue to grow at the current rate or at greater rates in the future. Shipping densities in specific areas and trends in routing and vessel design are as, or more, significant than the total number of vessels. Densities along existing coastal routes are expected to increase both domestically and internationally. New routes are also expected to develop as new ports are opened and existing ports are expanded. Vessel propulsion systems are also advancing toward faster ships operating in higher sea states for lower operating costs; and container ships are expected to become larger along certain routes (Southall, 2005).

While there are reports and statistics of whales struck by vessels in U.S. waters, the magnitude of the risks that commercial ship traffic poses to marine mammal populations is difficult to quantify or estimate. In addition, there is limited information on vessel strike interactions between ships and marine mammals outside of U.S. waters (de Stephanis and Urquiola, 2006). Laist et al. (2001) concluded that ship collisions may have a negligible effect on most marine mammal populations in general, except for regionally-based small populations where the significance of low numbers of collisions would be greater, given smaller populations or populations segments.

NOAA continues to review all shipping activities and their relationship to cumulative effects, particularly on large whale species. According to the NOAA report, the factors that contribute to ship strikes of whales are not clear, nor is it understood why some species appear more vulnerable than others. Nonetheless, the number of known ship strikes indicates that deaths and injuries from ships and shipping activities remain a threat to endangered large whale species.

One of the greatest threats to cetacean mortality and injury occurs in the commercial fishing industry. More whales die every year through entanglement in fishing gear than from any other cause. Gillnets, set nets, trammel nets, seines, trawling nets, and longlines pose the biggest threat. Gillnets contribute a very high proportion of global cetacean bycatch because of their low cost and widespread use. Traps and pots are often left in the water for extended periods of time. Whales may become entangled in the lines and have been observed swimming with portions of the gear wrapped around fins, flukes, neck, and mouth. Animals may travel long distances over time before they free themselves of the gear or die from the entanglement (Angliss and Demaster 1998). Programs targeted specifically to address the effects on large whales from commercial fisheries include a gear research and development program to reduce the amount of potentially hazardous gear in the water, and the disentanglement network whose personnel work to locate, assess, and remove gear from entangled whales. Recommendations under the recovery plan specific for right whales, designed to reduce commercial fishery interactions with whales, include gear restrictions and modifications, research, and regulatory and enforcement actions (NMFS 2007).

Entanglements may also occur with recreational fishing gear. Little data exists for recreational fishing interactions with marine mammals. As with commercial fishing, large whale entanglements may also result from interactions with recreational fishing. Finfish recreational fisheries typically involve rod and reel and hand lines while traps/pots are common for the lobster and crab industry. The risk of entanglement in recreational gear is relatively small for marine mammals (NMFS 2007).

In northern San Diego Bay, California sea lions use available docks, piers, and buoys to haul-out. It should be noted that San Diego Bay is heavily commercialized with significant amount of civilian pleasure boat traffic (7,000 berthed yachts and sailboats) (San Diego Harbor Police, unpublished data), commercial shipping traffic, and military vessel traffic that all pass by these haul-out locations. In addition, low level military jet and helicopters, and civilian aircraft from local airports constantly overfly the same haul-outs without visible pinniped reaction. The periodic occurrence of coastal stock of bottlenose dolphins have been exposed to the same background noise as well (overflights, vessels).

While the SSTC EIS discusses increases in some training events, the vessels and generally small boats involved are distributed in both time and space, so that typical events happen throughout the year without significant overlap. There is very little empirical data on marine mammal reaction to ambient vessel noise within Southern California integrated over time. In conclusion, the sound from the increased vessel activities would not have a significant cumulative effect on marine mammals within SSTC because no pinniped land haul-outs are within the action area, there is limited at-sea marine mammal occurrence within SSTC ocean areas, there is no marine mammal occurrence within the south San Diego Bay SSTC training areas, and local pinnipeds and dolphins are acclimated to regional anthropogenic sounds.

Habitat loss and degradation is now acknowledged to be a significant threat to cetacean populations (Kemp 1996). The impact of coastal development on whales has not been thoroughly investigated. Habitat alteration has the potential to disrupt the social behavior, food supply, and health of whales. Such activities may stress the animals and cause them to avoid traditional feeding and breeding areas or migratory routes. The most serious threat to cetacean populations from habitat destruction may ultimately prove to be its impact on the lower trophic levels in their food chains (Kemp 1996). Projects that involve dredging or shoreline development (1, 4, 5, 13, 14, 17, and 18 in Table 4-1) could temporarily disturb fish and modify fish habitat within a localized area and indirectly affect individual marine mammals. However, changes to fish habitat from dredging and shoreline modifications not considered to require mitigation would not be sufficient to affect individual fish populations or productivity to a measurable degree.

Insufficient information is available to determine how, or at what levels and in what combinations, environmental contaminants may affect cetaceans (Marine Mammal Commission [MMC] 2003). There is growing evidence that high contaminant burdens are associated with several physiological abnormalities, including skeletal deformations, developmental effects, reproductive and immunological disorders, and hormonal alterations (Reijnders and Aguilar 2002). It is possible that anthropogenic chemical contaminants initially cause immunosuppression, rendering whales susceptible to opportunistic bacterial, viral, and parasitic infection (De Swart et al. 1995).

Several mortality events (die-offs) have been reported for cetaceans. Biotoxins, viruses, bacteria, and El Niño events have been implicated in recent mass mortality events (Domingo et al. 2002). A mass mortality event for humpback whales, apparently associated with biotoxins, occurred along the beaches of Massachusetts in 1987 and 1988. Geraci et al. (1989) concluded that the whales had died from saxitoxin poisoning after consumption of Atlantic mackerel containing the toxin. During the summer of 2003, 17 humpback whales, 3 fin whales, 1 minke whale, 1 long-finned pilot whale, and 3 whales of undetermined species were found dead in the vicinity of Georges Bank. Although a biotoxin (saxitoxin) was found in several samples collected, it was not at lethal levels. Domoic acid was also detected and suspected as a probable cause, but because no brain samples were collected, the role of this biotoxin could not be confirmed (MMC 2004).

Underwater detonations may also have effects on marine mammals. Naval activities within the ROI include underwater detonations. Marine mammals that can be found in the area include gray whales, harbor seals, California sea lions, and bottlenose dolphins. Navy standard operating procedures (SOPs) include the observation of the activity area for 30 minutes prior to detonation and for 30 minutes after to ensure limited effects. Navy SOPs also require that Beaufort sea conditions are less than three before the activity is performed, so that adequate observation is possible. The likelihood that an injury would occur for marine mammal species typically present within the ROI would be negligible because of the low density, lack of high quality foraging habitat, and these species are often near the surface and the water area is relatively shallow. This last condition allows for successful sitings by personnel observing the area before training activities occur.

Risks to marine mammals emanate primarily from ship strikes, exposure to chemical toxins or biotoxins, exposure to fishing equipment that may result in entanglements, underwater detonation, and disruption or depletion of food sources from fishing pressure and other environmental factors. Past, present, and proposed activities within the ROI do not pose a threat to whale populations within the Pacific range. Ship strike, entanglement, and habitat impacts will not have a considerable impact on marine mammal species within the ROI. The cumulative impact of the Proposed Action and the identified projects in Table 4-1 could impact individual marine mammals but these effects would not be at a marine mammal stock level. Therefore, cumulative effects related to marine mammals due to implementation of the Proposed Action in conjunction with past, present, or planned projects in the ROI would be minimal.

### 4.3.10 Sea Turtles

Cumulative impacts on sea turtles would consist of the effects of the Proposed Action in combination with other projects, actions, and processes that would result in an incremental increase in sea turtle mortality, disturbance, and habitat modification. Contributory activities can be categorized into vessel activity, dredging, shoreline development, disturbance, and fishing as sources of potential impact. The ROI for potential cumulative effects to sea turtles encompasses a large area that includes San Diego Bay, nearshore waters of Southern California, and coastal waters and beaches of Mexico. Green sea turtles are the only known sea turtle species likely to be encountered in the ROI. Green sea turtles are considered resident occupants and are not documented to breed within the waters of the ROI.

Potential effects to green sea turtles from the Proposed Action include injury, disturbance, and modification of habitat. Injury and disturbance of green sea turtles and modification of green sea turtle habitat from activities are based on physical and acoustic impacts from vessel activity, pile driving, and explosives within the area the individual actions encompass, and the value and type of habitat known to occur within the specific footprint. (Sections 3.9.2.3 and 3.9.2.4).

Projects that involve dredging or shoreline development (1, 4, 5, 13, 14, 17, 18, and 23 in Table 4-1) could temporarily disturb green sea turtles and may modify foraging habitat within a localized area. Changes to green sea turtle foraging habitat from dredging and shoreline modification not considered to require mitigation would not be sufficient to affect individual green sea turtle populations or productivity to a measurable degree. Impacts from subsistence fishing, coastal development, and disturbance at green sea turtle breeding beaches in Mexico remain the largest threats to green sea turtle populations and breeding success. Vessel activity from other naval activities, commercial traffic, and private pleasure craft have steadily increased for decades and are not considered to adversely impact green sea turtles or their habitat. Green sea turtle mortalities from vessel strikes have not been increasing relative to the increased vessel traffic within the ROI. Historically, commercial fishing activities utilizing long lines and gill nets are documented to adversely impact green sea turtle populations but impacts to the San Diego Bay resident population foraging outside the Bay is unknown. Acoustic sources that are of major concern to green sea turtles include strong underwater shock pulses that can cause physical injury and underwater noise that could affect their behavior or foraging success. Navy training activities coupled with other consistent underwater noise sources from commercial and recreational sources would not be anticipated to create a considerable impact based on acoustic thresholds of the green sea turtle and the fact that the resident population of sea turtles is in San Diego Bay (away from areas most utilized for training activities and underwater detonations).

The status and trend of the resident San Diego Bay green sea turtle population has not been well studied and is based on limited formal data sets. Considering the variability and limited nature of available data sets in conjunction with the green sea turtles' large geographic range and migratory patterns, potential cumulative effects to green sea turtles attributed to San Diego County regional activities are below any measurable threshold. Therefore, cumulative effects related to green sea turtles due to implementation of the Proposed Action in combination with past, present, or planned projects in the ROI would be minimal.

### 4.3.11 Terrestrial Biological Resources

Cumulative impacts on terrestrial biota could result from the effects of the Proposed Action in conjunction with other past and future projects, actions, and processes that occur collectively and over a period of time. The area of influence for potential cumulative effects varies among the various mammals, reptiles, invertebrates (including the San Diego fairy shrimp), and plants including a number of special status species. In general, these plants and wildlife are limited to coastal Southern California and are resident in the terrestrial areas of the SSTC. The San Diego fairy shrimp is found in vernal pools and other seasonally filled soil depressions in coastal Southern California, from Santa Barbara County to northern Baja California, Mexico. Other species are more limited to Southern California dune complexes, including spiders and special status beetles, due to increased training tempo and access to training lanes.

The types of military training activities that could affect terrestrial biological resources include all those taking place on the upper beach above the wrack line (just above the high tide line), the dunes, and vegetated and unvegetated inland areas including vernal pools. These actions are amphibious and beach activities, vehicle use, fluid transfer actions, foot traffic, pyrotechnics including simunitions and blanks, manual excavations, and inland activities at SSTC-S. Several activities contribute to increased foot traffic and human presence that can degrade habitat; this may be through direct trampling of native vegetation and rare plants, the spread of invasive nonnative species, soil compaction, and erosion and sedimentation. These activities may also increase the potential for altering the competitive status of special status plants and wildlife through favoring more habitat generalists. In the inland area of SSTC-S, mammals such as the San Diego black-tailed jackrabbit could experience increased defensive behaviors due to increased human presence and noise. Navy training activities proposed at SSTC may have an effect on the San Diego fairy shrimp; however, management plans through INRMP guidelines would minimize potential effects from occurring in sensitive areas.

The potential impacts on terrestrial species and their respective habitats as a result of the projects identified in Table 4-1 stem from new beachfront development and public access improvements, such as NRRF Dredging, City of Coronado and Coronado Cays Storm Drain Rehabilitation, Beach Public Safety and Restrooms, Wastewater Master Plan, and Sand Replenishment Projects (Projects 2, 5, 7, 8, 11, and 14 respectively). Also, potential impacts may occur from construction associated with the NASNI/NBC Lodge Expansion, U.S. Navy Lighterage, Seacoast Inn Project, Imperial Beach Redevelopment, NRRF Cable Array, and Camp Surf Improvements (Projects 3, 11, 15, 16, 18, 19, and 23 in Table 4-1, respectively) which contribute to effects on terrestrial biological resources by eliminating or degrading habitat. By far, the greatest past and future potential cumulative impact from the collective effect over time and space of non-Navy activities is terrestrial habitat loss.

According to various Navy Integrated Natural Resources Management Plan (INRMPs) for San Diego, Coronado, and Imperial Beach, the Navy is addressing potential effects on terrestrial biota in several important ways, including measures to prevent the establishment of invasive plant species by minimizing the potential for introductions of seed or other plant parts (propagules) of exotic species and finding and eliminating incipient populations before they are able to spread. Key measures include 1) regular monitoring and treatment to detect and eliminate establishing exotic species; 2) effective measures to foster the reestablishment of native vegetation in areas where nonnative vegetation is present; 3) measures to correct developing erosion problems, such as correcting drainage from roads and culvert outlets where they contribute to concentration of flow potentially leading to gullying, and measures designed to stop the progression of existing gullies associated with developed sites and roads; and 4) maintenance of an up-to-date inventory of sensitive plant and wildlife species locations and consulting the inventory in all environmental reviews.

The Proposed Action’s effects on terrestrial biology in the ROI would be mitigated through INRMP guidelines, general management practices, and Endangered Species Act consultation. Any Navy contribution to cumulative effects of all past, present, and proposed projects within the ROI as it relates to habitat degradation and subsequent species impacts is reduced as a result of implementation of the specific mitigation measures identified. Therefore, cumulative effects related to terrestrial biological resources due to implementation of the Proposed Action in conjunction with past, present, or planned projects in the ROI would be minimal.

### 4.3.12 Birds

Cumulative impacts on birds could result from the Proposed Action in conjunction with other past and future projects, actions, and processes that occur collectively and over a period of time. Bird species encompass varying distribution patterns; thus cumulative impacts have varying areas of influence. Some are resident breeders, while others are fall or winter migrants that come to rest and forage, and still others arrive to nest (mostly seabirds) in the spring and summer. Each species uses the area in various ways in time and space. The area of influence for potential cumulative effects is very wide for migratory birds of the Pacific Flyway coming from Canada and Alaska, as well as the neotropical migrants arriving from southern Mexico, Central America, and farther. Resident breeders have a much more constrained range, generally coastal Southern California's wetland areas.

Potential effects to birds from the Proposed Action include mortality and injury, disturbance, and modification of habitat. Mortality, injury, and disturbance of birds or modification of habitat could stem from most of the activities described for the Proposed Action, including physical and acoustic impacts of detonations, pyrotechnics, pile driving, vessel traffic that causes flushing or direct impact, vehicle use or foot traffic that tramples nests or flushes birds, shoreline construction or amphibious activities that alter substrate conditions or create temporary turbidity, activities that might release chemicals into the water, or introduction of debris into the water column. Impacts to diving birds in the vicinity of underwater detonation points are avoided and minimized because these activities are halted until the birds have left the area (Sections 3.12.2.3 and 3.12.2.4 for full analysis).

Contributory activities from the projects listed within Table 4-1 can be categorized into the following sources of potential impact: 1) restoration plans that involve habitat type conversion or foster increased predation, 2) beachfront development, 3) dredging, and 4) increased public access of areas used by birds. Projects listed within Table 4-1 that involve shoreline development or dredging (1, 4, 5, 13, 14, 17, 18, 23, and 24) temporarily or permanently disturb habitat used by birds within a localized area, and can create habitat for predators of shorebirds and nesting seabirds. Changes to substrate from shoreline modification not requiring mitigation would not be sufficient to affect individual populations or productivity of avian forage to a measurable degree. Vessel activity from other naval activities, commercial traffic, and private pleasure craft have steadily increased for decades and are not considered to have adversely impacted bird populations or their habitat. The areas of highest abundance and diversity for invertebrate forage for birds, such as mudflats, salt pond, and salt marsh, are avoided by the Proposed Action as well as other proposed activities in Table 4-1, with the exception of the Comprehensive Conservation Plan (CCP) restoration proposal (Project 21 in Table 4-1). Restoration plans that involve habitat type conversion can affect one class of bird over another. The United States Fish and Wildlife Service USFWS' CCP for the South Bay National Wildlife Refuge, if implemented, could favor salt marsh over shorebird habitat. Therefore, there could be a cumulative impact to shorebirds due to development or restoration plans in combination with projects that degrade intertidal areas preferred by shorebirds for foraging or resting. However, this concern is minimized or even eliminated because of the protection from development afforded to shorebirds by the presence of the Refuge, and because of the requirement to mitigate any losses under the Clean Water Act.

Large scale concerns for bird populations, such as climate change, reduced fish populations, discharge of hazardous chemicals and sewage, and development in other regions or countries are not well defined for individual species; however, the overall decline of birds has been attributed to these causes and so they must be considered. The single greatest concern is the loss of suitable habitat for nesting and roosting shorebirds and seabirds throughout coastal California due to land development and human encroachment. No permanent habitat loss is expected from the Proposed Action. Overall, the protection from urban development afforded by the security and safety requirement of military training activities has maintained the habitat for a wide array and abundance of migratory birds. By default, open space within military installations in coastal locations has become vital to the persistence of bird breeding and roosting populations because effective Navy training requires land to be in its natural state.

The cumulative impact of the Proposed Action and the identified projects in Table 4-1 could impact individual birds, their overall foraging success, and breeding opportunity, but these would not affect any overall bird populations. The consequences of the proposed military training on nonfederally listed migratory birds or modification of their habitat are evaluated based on the significance criteria described in the final rule authorizing the Department of Defense to take migratory birds during military readiness activities (50 CFR 21). As mentioned previously (Section 3.12.1.1.1), military readiness activities are exempt from the take prohibitions of the Migratory Bird Treaty Act provided they do not result in a significant adverse effect on a population of a migratory bird species. Analysis within Section 3.12 states that all native, indigenous birds are covered under the Migratory Bird Treaty Act (3.12.1.1.1). Further analysis states that there would be no adverse effect on overall populations of bird species with the implementation of the Proposed Action. Similarly, contributing stressors from Table 4-1 listed above would not adversely affect overall populations of bird species. Therefore, cumulative effects related to birds due to implementation of the Proposed Action in conjunction with past, present, or planned projects in the ROI would be minimal.

### 4.3.12.1 California Least Tern

California least terns are present in the area of San Diego Bay from about mid-April to early September. Effects from activities described under the Proposed Action are analyzed in detail in the Biological Assessment associated with this EIS, and cumulative effects from other nonfederal actions in the SSTC ROI are also considered in the assessment. The additional vessels, shoreline development, human access, and other effects of the projects listed in Table 4-1 are not expected to make a measurable difference on the California least tern's success because the other nesting sites nearby and in the region are for the most part already protected from development and human access. An exception may be the cumulative effect of actions that increase the probability of invasive weeds in nesting areas or predation at nesting sites, such as by the gull-bill tern, rats, feral cats, and ants. Fewer, more densely occupied protected sites on both federal and nonfederal lands for nesting terns also increases the probability of impacts from predation, disease, or other catastrophic events. Counteracting these cumulative effects would be the expected enhancement of areas of intertidal habitat in San Diego Bay, such as at the Chula Vista Wildlife Reserve. The Navy's comprehensive management program for the California least tern on its training areas in San Diego Bay includes intensive monitoring of the birds as well as predator control and habitat enhancement projects. These management measures can help mitigate, with additional effort, adverse effects from off-site sources.

### 4.3.12.2 Western Snowy Plover

The western snowy plover nests in colonies on sandy beaches in the San Diego Bay area from March into mid-to-late September. Kelp wrack provides an abundant food source for the invertebrates that frequent these kelp piles, and mudflats are also used for foraging. Effects of increased human access, increased predation, and loss or conversion of intertidal mudflats to vegetated habitat could have cumulative impacts on the snowy plover. Intrusion of salt marsh vegetation, or of nonnative vegetation, on plover nesting grounds poses problems for plover chicks, possibly preventing them from moving freely to forage or escape incoming tides (Copper 1997a, b). Predation by birds and mammals (especially ravens and crows) is the primary cause of reproductive failure for plovers (Copper 1997a, b; USFWS 1997b). Several of the projects identified in Table 4-1 include increased public usage to SSTC beaches, specifically projects 3, 15, and 16. This increased public usage could result in adverse cumulative effects in combination with the Navy's Proposed Action. However, the Navy's comprehensive management program for the western snowy plover on its training areas in San Diego Bay includes intensive monitoring of the birds, predator control, limiting public usage of nesting beaches, and habitat enhancement projects. Other unknown causes of mortality in and around San Diego Bay have been documented and studied by the USFWS with full support of the Navy. These management measures can help mitigate, with additional effort, adverse effects from off-site sources.

#### 4.3.12.3 California Brown Pelican

In the SSTC ROI, pelicans, especially postbreeding juveniles gather before fall migration, roost, and prepare to scatter to find new territory. The only breeding population in United States waters is the SCB population, which consists of breeding birds on the Channel Islands. The USFWS estimates that 12,000 individual California brown pelicans (6,000 pairs) have bred in southern California in recent years, composing approximately 12 percent of the California subspecies (about 100,000 breeding birds). None of the actions described under the Proposed Action or in the projects listed in Table 4-1 are expected to have a cumulative impact on this species. Previous causes of decline have been greatly reduced largely through the Environmental Protection Agency's banning of the use of dichlorodiphenyltricholoroethane and similar pesticides in 1972. Other factors implicated in the decline of this subspecies include human disturbance at nesting colonies and food shortages (USFWS 2008). The brown pelican nests mostly on offshore islands, so such disturbance is not possible by any of the activities under the Proposed Action. Food shortages are part of a larger climate effect and are not affected by any of the activities under the Proposed Action.

### 4.3.13 Cultural Resources

Cumulative impacts on cultural resources would consist of the effects of the Proposed Action in combination with other projects, actions, and processes that would result in potential impacts on cultural, archaeological, and historic sites. Implementation of the Proposed Action would have little or no contribution to impacts on known underwater and terrestrial cultural resources, due to the few cultural sites present and the limited use of the activity area and because training activities actively avoid these locations.

Projects listed in Table 4-1 with the potential to disturb cultural resources would undergo environmental review and, if necessary, be assigned mitigation measures similar to those described for the Proposed Action. All digging and dredging around any recorded archeological sites with known or potential eligibility for listing with the National Register of Historic Places (NHPA) would be restricted. All eligible or potentially eligible archeological sites, if located, would be restricted to foot traffic only. With mitigation measures observed, most other ongoing and anticipated projects described in Table 4-1 would not substantially affect underwater cultural resources. Military projects detailed in Table 4-1 would be addressed under the NHPA. As dictated by the NHPA, the U.S. Navy is obligated to protect its own historic properties in a way that emphasizes preservation and minimizes the impact of undertakings that might adversely affect such properties.

In conclusion, proposed and ongoing projects by surrounding cities and municipalities may cause effects to cultural resources but they would not be the same resources potentially affected by the Navy. Therefore, cumulative effects related to cultural resources as a result of implementation of the Proposed Action in combination with past, present, or planned projects in the ROI would be minimal.

### 4.3.14 Transportation and Circulation

Implementation of the Proposed Action would generate an increase in vehicle trips and vessel traffic associated with military training activities. Since no increase in employment is associated with the Proposed Action, increases in traffic volumes would be associated with proposed increases in training tempo. The Proposed Action would contribute to increased traffic at intersections in front of NAB in Coronado and at the NRRF gate in Imperial Beach. Military training activities along Silver Strand Boulevard would represent approximately two percent of the total daily traffic volume.

Cumulative impacts on transportation and circulation would consist of the effects of the Proposed Action in combination with other projects, actions, and processes that would result in increased traffic volumes or vessel traffic in the ROI. Traffic generation associated with military and civilian projects that are completed, in progress, or planned for development in Coronado and Imperial Beach detailed in Table 4-1 have been factored into San Diego Association of Governments traffic forecasts. Therefore, while individual projects would contribute to traffic generation on roadways affected by the Proposed Action, regional level planning has taken place to consider associated traffic levels. Increased traffic from three NIMITZ-Class aircraft carriers (Project 17 in Table 4-1) was determined to have a minimal cumulative effect due to the fact that the three carriers would be in port concurrently an average of twenty nine intermittent, non-consecutive days each year (DoN 2008). Projects in the past, present, or planned in the SSTC ROI involving marine vessels generally do not result in disruptions to vessel traffic in the area. Therefore, cumulative effects related to transportation and circulation (vehicles and vessels) due to implementation of the Proposed Action in combination with past, present, or planned projects in the ROI would be minimal.

### 4.3.15 Socioeconomics, Environmental Justice, and Protection of Children

Cumulative impacts on socioeconomics, Environmental Justice, and Protection of Children would consist of the effects of the Proposed Action in combination with other projects, actions, and processes that would result in effects on regional employment, income, housing, or infrastructure.

Implementation of the Proposed Action would not result in an increase in permanently stationed personnel or employees at SSTC. Despite an increase in training tempo, proposed activities would be conducted by Navy personnel and staffing employed in the region. Therefore, existing regional population and associated housing impacts, employment rates, and regional economy would remain unchanged as a result of implementation of the Proposed Action. In addition, implementation of the Proposed Action would not create any disproportionately high and adverse human health or environmental effects on minority or low income populations, nor would the safety risks of the Proposed Action disproportionately affect children. Implementation of the Proposed Action would not affect the hearing of children, but may momentarily disrupt communication in nearby residences and schools (See Sections 3.15.2.3 and 3.15.2.4).

The Proposed Action would not contribute to cumulative effects in the region due to lack of effect on regional employment, income, housing, or infrastructure. In conclusion, cumulative effects related to socioeconomics due to implementation of the Proposed Action in combination with past, present, or planned projects in the ROI would be minimal.

### 4.3.16 Public Health and Safety

Cumulative impacts on public health and safety would consist of the aggregate effects of the Proposed Action and other projects, actions, and processes that could increase risks to people within the ROI. The ROI for public health and safety consists of Silver Strand peninsula, bayside and oceanside training areas, and adjacent public areas. Relevant effects in marine areas would include danger from the Proposed Action, recreational and commercial fishing, dredging and sand replenishment projects (see Table 4-1), ship collisions/ ship strike, and other natural ocean dangers. Relevant effects in terrestrial areas would include danger from proximity to construction vehicles and equipment. The cumulative effects of these activities are known only in a very general sense.

Training at SSTC has the potential to pose a risk to the public primarily through off-site aircraft and vessel operations, underwater detonations, and intrusion of the public into SSTC training areas. Under the Proposed Action, the level of unauthorized access to training areas could decrease in response to more intense use of beach areas by the Navy. Aircraft and marine vessel support for Navy training activities would increase, but public safety is expected to be maintained (see Section 3.16). The volume of Navy underwater detonation activities poses a risk that training equipment could be lost and recovered by beachgoers, recreational fisherman, or divers. The Navy has specific and documented procedures in place to ensure that nonparticipants are not endangered by Navy actions.

Marine and terrestrial naval training activities could affect nearby individuals; however this potential is mitigated by United States Coast Guard regulations on the water, vehicle and traffic laws of surrounding areas, and local ordinances. Navy range clearance measures after completion of training evolutions and active monitoring for nonparticipant activity on the beach, ocean, and bayside training areas are mitigation measures established by the military to prevent harm and ensure public safety. Training and support activities in joint military-public use areas outside of SSTC, such as aircraft and watercraft transiting to and from the training areas, have the most potential for impacts on public health and safety.

The Proposed Action and other activities performed and proposed by surrounding commercial, industrial, and recreational interests do not normally increase the risk of impacts on health and public safety resources. The incremental impacts of the Proposed Action do not represent any appreciable contribution to cumulative health and safety risks when added to other past, present, and reasonably foreseeable future actions. Therefore, cumulative effects on public health and safety from implementation of the Proposed Action when added to past, present, or planned projects in the ROI would be minimal.

# 5 Mitigation

# 5 MITIGATION

As part of the Navy's commitment to sustainable use of resources and environmental stewardship, the Navy incorporates measures that are protective of the environment into all of its activities. These include employment of best management practices, standard operating procedures, adoption of conservation recommendations, and other measures that mitigate the impacts of Navy activities on the environment. Some of these measures are applicable and others are designed to apply to certain geographic areas during certain times of year and for specific types of Navy training. Mitigation measures covering habitats and species occurring in the Silver Strand Training Complex (SSTC) have been developed through various environmental analyses conducted by the Navy for land and sea ranges and adjacent coastal waters. These mitigation measures are promulgated through the use of Navy messages issued to all units and commands training on SSTC. The following discussion describes mitigation measures applicable to Navy activities at SSTC.

In addition to identification of current mitigation measures, the EIS also identifies, in compliance with 40 Code of Federal Regulations (CFR) 1502.14 (h), further measures not currently being undertaken that would mitigate environmental impacts to a given resource. Each of the alternatives, including the Proposed Action considered in the Environmental Impact Statement (EIS), includes mitigation measures intended to reduce the environmental effects of Navy activities.

## 5.1 LAND USE AND RECREATION

There are no mitigation measures implemented to minimize impacts specific to land use in the SSTC Region of Interest (ROI). However, the Navy strives to be a good neighbor to the community by maintaining, to the greatest extent practicable, land use compatibility with the surrounding neighborhood and providing public access whenever possible. The Navy recognizes the importance of public access and works with the community to ensure access to the public beach areas. Further, there are mitigation measures in place for other resources that apply to land use on SSTC, mainly through the stipulation of training parameters (e.g., Acoustic Environment [Section 3.6], Biological Resources [Sections 3.7-3.12], Public Health and Safety [Section 3.16]).

## 5.2 GEOLOGY AND SOILS

The Navy has implemented the following measures to mitigate the effects of its training activities on soils:

- Sand (of a quality that is appropriate for nesting California least terns) is periodically replenished on Delta beaches when available.
- Vegetation on the back dunes of SSTC beaches is maintained to reduce water and wind erosion.
- In inland SSTC-South (S) areas, vehicles are restricted to existing roads to minimize the loss of vegetation.

No new measures are necessary to mitigate effects of the Proposed Action on SSTC soils or sediments. No substantial impacts on soils from these activities were identified. However, current mitigation measures, in place to mitigate the effects of training activities on soils, would continue to be implemented at SSTC.

## 5.3 AIR QUALITY

The Navy has a comprehensive air quality management program. Mitigation measures that are part of the Navy's air quality management practices are implemented at SSTC. Vehicles participating in training exercises that occur on unpaved surfaces travel at slow speeds, which minimizes fugitive dust generation.

Training areas at SSTC include beach areas, where vehicles travel on hard-packed or wet sand with minimal silt content, which also minimizes fugitive dust generation. Aircraft, marine vessels, ground vehicles, and TSE are required to be maintained and meet applicable emission standards (such as smog certification for on-road vehicles) in accordance with state requirements.

The current Navy air quality management program and practices would continue to be implemented at SSTC.

## 5.4 HAZARDOUS MATERIALS AND WASTE

The Navy's general instructions (e.g., Chief of Naval Operations Instruction [OPNAVINST] 5090.1) and training activity planning and review processes serve to ensure that hazardous materials and hazardous wastes are stored and handled appropriately. The Navy’s current mitigation measures include its *Business Plan* (Section 3.4.1.3), *Naval Base Coronado (NBC) Hazardous Substance Release Integrated Contingency Plan* (DoN 2008), and *Regional Explosive HWMP* (Section 3.4.1.4). Navy personnel also collect expended training materials at the conclusion of a training activity to the extent practicable.

Current mitigation measures, including implementation of practices outlined in Navy plans (listed in Section 3.4.1.5) and the collection of expended training materials, would continue to be implemented.

## 5.5 WATER RESOURCES

The Navy’s current practices affecting water quality, primarily hazardous materials handling and waste disposal practices, are based on requirements in OPNAVINST 5090.1. Those requirements, in turn, were developed primarily to comply with federal environmental regulations. Efforts to preserve vegetation on the backsides of dunes along the shoreline may reduce erosion and thus reduce transport of sediments into adjacent surface waters. Collection of spent training materials at the conclusion of training activities also may incrementally reduce the amounts of contaminants transported into adjacent waters.

With respect to water use, the Navy mitigates potential effects by avoiding washing causeway pier sections in the ocean and by pumping seawater through its Offshore Petroleum Discharge System during training instead of using petroleum products. OPNAVINST includes guidance on shipboard operations afloat.

Current mitigation measures implemented to protect water quality would continue to be implemented.

## 5.6 ACOUSTIC ENVIRONMENT (TERRESTRIAL)

Noise effects of Navy training activities at SSTC are managed via administrative controls (planning). Activity planning considers location (e.g., Breacher training are located in inland areas) and time of day. Call-outs during physical conditioning training are minimized at night and when in residential areas. The Navy notifies local emergency personnel prior to training exercises that include the use of pyrotechnics or blanks.

There are no new proposed mitigation measures for any of the alternatives. Current mitigation measures (Section 3.6.1.6) will continue to be implemented for Navy training at SSTC.

## 5.7 MARINE BIOLOGICAL RESOURCES

### 5.7.1 Current Management of Marine Special Aquatic Sites

Eelgrass is mapped throughout San Diego Bay about every three to five years jointly by the Navy and Port of San Diego as part of implementing the San Diego Bay Integrated Natural Resources Management Plan (INRMP). Eelgrass transects are monitored on an annual basis by the Navy and Port of San Diego.

### 5.7.2 Current Management of Invertebrates as Water and Sediment Quality Indicators

The Navy participates in the national water quality monitoring program called Mussel Watch. National Oceanic and Atmospheric Administration's (NOAA) National Status and Trends Program Mussel Watch Project (1986-present) monitors bioaccumulation in mussels, plus other parameters offshore in south San Diego Bay and intertidal and offshore in north San Diego Bay. NOAA also conducts the National Benthic Surveillance Program (1984-present) to examine physical, chemical, and biological (diseases and bioaccumulation in fish) parameters in offshore areas of central and north San Diego Bay.

### 5.7.3 Current Mitigation Measures

The sections above describe special aquatic sites, and what the Navy does to monitor their status and to comply with state and federal regulations. Essential Fish Habitat (EFH) is discussed in Section 3.7 and 3.8.

Eelgrass is managed in compliance with the Southern California Eelgrass Mitigation Policy, created jointly in 1991 by United Stated Fish and Wildlife Service (USFWS), National Marine Fisheries Service (NMFS), and California Department of Fish and Game (CDFG), which established protocols for mitigating adverse impacts to eelgrass. Project sponsors must follow the guidelines of how and when to survey, map, choose a mitigation site, replant, monitor, and meet success criteria for the eelgrass. Delays in any of these stages can result in financial penalties. The Navy has established several Navy Eelgrass Mitigation Sites (NEMS) to compensate for past impacts and to mitigate future impacts on eelgrass habitat within San Diego Bay. Eelgrass that has been planted and not used to compensate for previous losses is banked for future use in accordance with the Southern California Eelgrass Mitigation Policy. Five eelgrass mitigation sites contributing to the bank have already been constructed and met the five-year performance standards required by NMFS. This mitigation banking agreement between the Navy and NMFS was recently signed as the Navy's Eelgrass Mitigation Bank Management Plan, and establishes a system of management, administration, and accounting for the Navy (Department of the Navy [DoN], 2008). The principal goal of the mitigation bank is to establish functional eelgrass habitat qualifying as a special aquatic site, as defined in 40 CFR 230.40-45, within San Diego Bay for mitigating impacts associated with projects and operational training needs, and to establish credits from surplus habitats for future use. A Mitigation Bank Technical Team, a multiagency team, provides technical expertise in and support for implementing the Bank. The team includes the Navy as Chair, U.S. Army Corps of Engineers, USFWS, NMFS, and CDFG.

Besides the NEMS, the Navy maintains permanent eelgrass monitoring transects in San Diego Bay that are monitored every year (Figure 3.7-9) and bay-wide mapping of eelgrass density classes is conducted every three to five years in a joint Navy-Port of San Diego effort (1994, 1999/2000, 2004, and 2008, the most current 2008 data was recently made available (DoN, 2009). This monitoring program allows the Navy to track fluctuations in the coverage, extent, and health of eelgrass in San Diego Bay. These data provide a valuable long-term perspective that can help identify effects from catastrophic, as well as seasonal natural and anthropogenic events.

### 5.7.4 Proposed Mitigation Measures

Mitigation for impacts to 1.13 acres of eelgrass (designated as EFH) for larger boat landings, Elevated Causeway (ELCAS), and causeway insertions in the designated training lane on Bravo Beach will be mitigated and consistent with the Southern California Eelgrass Mitigation Policy. This mitigation will occur at an established NEMS and be drawn as part of the Navy Eelgrass Mitigation Bank.

As a result of consultation with the NMFS for EFH, the Navy will conduct a new bottom habitat mapping survey to more accurately detail potential habitat types (ex., sand, cobble, rocks) within the oceanside SSTC boat lanes. This effort, scheduled to begin in 2011, is designed to update bottom type classification at finer resolution and spatial scales than previous California State funded surveys from 2002. The goal from this Navy funded survey would be to provide information to NMFS on habitat types within SSTC, and to Navy commands conducting underwater detonations at SSTC for consideration in selection of appropriate bottom-laid detonation sites.

## 5.8 FISH

Habitat mitigation for intertidal and subtidal areas (see Section 3.7), including eelgrass, provide a degree of mitigation for fish species documented to reside within those habitats.

All species groups are monitored through the San Diego Bay INRMP, including, at a minimum, baseline inventory and regular monitoring. A portion of the fish species are also intermittently evaluated through the project site approval process. The most recent comprehensive San Diego Bay survey effort was in April and July 2005 (Pondella et al. 2006). Surveys identify and quantify San Diego Bay's utilization of fishery populations, identify habitats that support juvenile fish, and determine areas of San Diego Bay that support important populations of forage fish species. The INRMP and surveys are funded jointly by the U.S. Navy and the Port of San Diego.

Since most of the local marine environment consists of soft-bottom habitat with few rocky habitats, the local fish populations are not robust, thus most Navy activities implemented for Alternatives 1 and 2 will not affect fish populations within the ROI. The largest expected impact to fish species and assemblages comes from underwater detonations and the modification or destruction of eelgrass habitat within Bravo training area. The mitigation for 1.13 acres of lost eelgrass habitat stipulated in Section 3.7 would compensate for fish and fish habitat lost or displaced by Navy activities, thus partially mitigating effects to fish and eelgrass habitat. Additionally, the set aside of undeveloped shoreline for training assures that high value eelgrass and saltmarsh habitat remains available to fish for foraging and reproduction.

As a result of the EFH consultation with the NMFS, the Navy will conduct a new bottom habitat mapping survey to more accurately detail potential habitat types (ex., sand, cobble, rocks) within the oceanside SSTC boat lanes. This effort, scheduled to begin in 2011, is designed to update bottom type classification at finer resolution and spatial scales than previous California State funded surveys from 2002. The goal from this Navy funded survey would be to provide information to NMFS on habitat types within SSTC, and to Navy commands conducting underwater detonations at SSTC for consideration in selection of appropriate bottom-laid detonation sites. Similar to the measures used to avoid sensitive habitats when selecting underwater explosive device detonation sites, the nearshore habitat survey data will also be used to ensure the OPDS system is not placed within any sensitive habitats.

The Navy will conduct April to May pre-event surveys for grunion prior to SSTC training events that could to disturb intertidal beach areas. From Table 2-1, events identified for grunion pre-event surveys include 41- Causeway Pier Insertion and Retraction training (max. of 10 per year), and 42-ELCAS (max. of four per year). These training events generally occur within only a few boat\beach lanes in SSTC-N and can occur throughout the year. For events that have a requirement to occur in April and May, the

Navy will use predicted grunion spawning periods obtained from the California Department of Fish and Game (http://www.dfg.ca.gov/marine/grunionschedule.asp ) to anticipate times to survey 10-14 days prior to the next ELCAS or Causeway Pier Insertion and Retraction.

This survey will identify if grunion spawning occurred or did not occur on the beach area scheduled for training. If grunion spawning is documented, then a determination on the spatial extent of spawn across the planned training area and magnitude of spawning (on the standard grunion 0-5 spawning scale) will be made. If a significant spawning run is observed (4 or 5 on the spawning scale) coincidental with and at the same location as the beach-impacting training event, the Navy will attempt to delay the event or move to a training area of lower density spawning or an area of no spawning. If such a shift cannot be done due to schedule conflict over multiple SSTC boat and beach lanes, logistic requirements to use a specific lane or area within a lane that precludes a shift, or safety considerations (ex., weather conditions, sea state), then the Navy will inform NMFS Southwest Region that training was conducted on that site for the specified reason.

Under the NMFS Incidental Harassment Authorization (IHA) consultation, there will likely be annual SSTC-specific reporting requirements on the quantities (number of detonations) and types (charge weight) of individual explosive used. In addition, also as part of the IHA monitoring requirement, the Navy will be conducting representative mitigation monitoring for a sub-set of the total underwater detonations authorized by NMFS. This is approximately 4-16 individual detonation training events. During this monitoring, civilian marine biologists will independently observe the oceanside detonation site for marine mammals and sea turtles to ensure and document that the correct protective measures are applied. Under the EFH consultation, these biologists will also document the extent and quantity of any fish morality (or lack of mortality). This information will be included in the Navy's annual monitoring report to NMFS.

## 5.9 MARINE MAMMALS

As discussed in Section 3.9, the measures implemented by the Navy to reduce impacts to marine mammals apply to marine mammals that transit through the offshore training lanes. In particular, establishment of marine mammal exclusion zones for underwater detonations of explosives, pile driving/removal activities and pre- and post-exercise surveys, all serve to reduce or eliminate potential impacts of Navy activities marine mammals that may be present in the vicinity.

Effective training in the SSTC dictates that activity participants utilize their sensors and exercise weapons to their optimum capabilities as required by the mission. This section is a comprehensive list of mitigation measures that would be utilized for training activities analyzed in the SSTC in order to minimize potential for impacts on marine mammals in the SSTC.

This section includes protective and mitigation measures that are followed for all types of exercises; those that are associated with a particular type of training event; and those that apply to a particular geographic region or season. Appropriate measures are also provided to non-Navy participants (other Department of Defense [DoD] and allied forces) as information in order to ensure their use by these participants.

### 5.9.1 Current Mitigation Measures

The following mitigation measures, which are situation/location dependent (e.g., substrate type, water depth, charge weights, etc) for underwater detonations incorporate the existing range procedures at SSTC and are consistent with existing training objectives and activities as well as established human safety procedures. In case of unanticipated conflict, human safety considerations will take precedence and such conflicts are always used to make incremental improvements in the procedures used in subsequent activities.

Mitigation measures for very shallow water (VSW) underwater detonations on SSTC oceanside (0-24 feet):

- Easily visible anchored floats will be positioned on a 1,200 foot or 400 yard radius of a roughly semi-circular zone (the shoreward half being bounded by shoreline and immediate off-shore water) around the detonation location for small explosive exercises at the SSTC. These mark the outer limits of the mitigation zone.
- For each VSW underwater detonation event, a safety-boat with a minimum of one observer is launched 30 or more minutes prior to detonation and moves through the area around the detonation site. The task of the safety observer is to exclude humans from coming into the area and to augment a shore observer's visual search of the mitigation zone for marine mammals. The safety-boat observer is in constant radio communication with the exercise coordinator and shore observer discussed below.
- A shore-based observer will also be deployed for VSW detonations in addition to boat based observers. The shore observer will indicate that the area is clear of marine mammals after 10 or more minutes of continuous observation with no marine mammals having been seen in the mitigation zone (1,200 feet or 400 yards) or moving toward it.
- At least 10 minutes prior to the planned initiation of the detonation event-sequence, the shore observer, on an elevated on-shore position, begins a continuous visual search with binoculars of the mitigation zone. At this time, the safety-boat observer informs the shore observer if any marine mammal has been seen in the zone and, together, both search the surface within and beyond the mitigation zone for marine mammals (and other protected species such as sea turtles).
- The observers (boat and shore based) will indicate that the area is not clear any time a marine mammal is sited in the mitigation zone or moving toward it and, subsequently, indicate that the area is clear of marine mammals when the animal is out and moving away and no other marine mammals have been sited.
- Initiation of the detonation sequence will only began on final receipt of an indication from the shore observer that the area is clear of marine mammals and will be postponed on receipt of an indication from that any observer that the area is not clear of marine mammals.
- Following the detonation, visual monitoring of the mitigation zone continues for 30 minutes for the appearance of any marine mammal in the zone. Any marine mammal appearing in the area will be observed for signs of possible injury.
- Any marine mammal observed after an VSW underwater detonation either injured or exhibiting signs of distress will be reported to Navy environmental representatives from the regional Navy shore commander (Commander, Navy Region Southwest) and U.S. Pacific Fleet, Environmental Office, San Diego Detachment. The Navy will report these events to the Stranding Coordinator of NMFS' Southwest Regional Office using Marine Mammal Stranding communication trees and contact procedures established for the Southern California Range Complex. These voice or email reports will contain the date and time of the sighting, location (or if precise latitude and longitude is not currently available, then the approximate location in reference to an established SSTC beach feature), species description (if known), and indication of the animal's status.

Mitigation measures for shallow water underwater detonations on SSTC oceanside (24-72 feet):

- A mitigation zone of 1,500 feet or 500 yards will be established around each underwater detonation point. This mitigation zone is based on the maximum range to onset-TTS (either 23 psi or 182 dB).

- A minimum of two boats, including but not limited to small zodiacs and 11-meter Rigid Hulled Inflatable Boats (RHIB) will be deployed. One boat will act as an observer platform, while the other boat is typically the diver support boat.
- Two observers with binoculars on one small craft/boat will survey the detonation area and the mitigation zone for marine mammals from at least 30 minutes prior to commencement of the scheduled explosive event and until at least 30 minutes after detonation.
- In addition to the dedicated observers, all divers and boat operators engaged in detonation events can potentially monitor the area immediately surrounding the point of detonation for marine mammals (and other protected species such as sea turtles).
- If a marine mammal is sighted within the 1,500 foot or 500 yard mitigation zone or moving towards it, underwater detonation events will be suspended until the marine mammal has voluntarily left the area and the area is clear of marine mammals for at least 30 minutes.
- Immediately following the detonation, visual monitoring for marine mammals within the mitigation zone will continue for 30 minutes. Any marine mammal observed after an underwater detonation either injured or exhibiting signs of distress will be reported to Navy environmental representatives from the regional Navy shore commander (Commander, Navy Region Southwest) and U.S. Pacific Fleet, Environmental Office, San Diego Detachment. The Navy will report these events to the Stranding Coordinator of NMFS' Southwest Regional Office using Marine Mammal Stranding communication trees and contact procedures established for the Southern California Range Complex. These voice or email reports will contain the date and time of the sighting, location (or if precise latitude and longitude is not currently available, then the approximate location in reference to an established SSTC beach feature), species description (if known), and indication of the animal's status.

Mitigation for ELCAS/Pile Driving Activities on SSTC oceanside:

- A mitigation zone will be established at 150 feet or 50 yards from ELCAS pile driving and pile removal events. This mitigation zone is base on the predicted range to Level A harassment (180 dB RMS) for cetaceans, and is being applied conservatively to both cetaceans and pinnipeds.
- Monitoring will be conducted within the 150 foot or 50 yard mitigation zone surrounding ELCAS pile driving and removal events for the presence of marine mammals (and other protected species such as sea turtles) before, during, and after pile driving and removal events.
- If marine mammals are found within the 150 foot or 50 yard mitigation zone, pile removal events will be halted until the marine mammals (or sea turtles) have voluntarily left the mitigation zone.
- Monitoring for marine mammals (or sea turtles) will take place concurrent with pile removal events and 30 minutes prior to pile driving and removal commencement. A minimum of one trained observer will be placed on shore, on the ELCAS, or in a boat at the best vantage point(s) practicable to monitor for marine mammals.
- Monitoring observer(s) will implement shut–down/delay procedures when applicable by calling for shut–down to the hammer operator when marine mammals (or sea turtles) are sighted within the mitigation zone.
- Soft Start - Providing additional protection for marine mammals (and sea turtles), ELCAS pile driving includes a soft start as part of normal construction procedures. The pile driver increases impact strength as resistance goes up. At first, the pile driver piston drops a few inches. As resistance goes up, the pile driver piston will drop from a higher distance thus providing more impact due to gravity. This will allow marine mammals in the project area to vacate or begin vacating the area minimizing potential harassment. The ELCAS soft start is not the traditional soft-start used in bigger civilian construction projects, and doesn't include a waiting period (an initial set of several strikes from the impact hammer at 40-60 percent energy levels, followed by a

one minute waiting period, then two subsequent 3 strike sets), but does provide additional time for marine mammals to vacate the area. Including waiting periods as part of training would be inconsistent with Navy training objectives that requires the ELCAS to be constructed as quickly as possible in real world conditions to ensure rapid supply of equipment and materials to shore in a hostile territory during wartime, or during humanitarian assistance operations.

### 5.9.2 Proposed Mitigation Measures

Mitigation measures for oceanside underwater detonations would remain the same as described above. The buffer increase would accommodate the largest Level B behavioral harassment ZOI (distance to sub-TTS threshold) under Alternatives 1 and 2 (MMS sequential detonations).

In addition, the Navy would implement mitigation measures for underwater detonations involving Shock Wave Generator (SWAG), which are proposed in Alternative 1 and 2, but are not currently conducted. For SWAG charges laid bayside on SSTC:

- A buffer zone of 180 feet will be established around each SWAG detonation point.
- Observer(s) with binoculars and small craft will survey the detonation area and the buffer zone for marine mammals from at least 10 minutes prior to commencement of the scheduled explosive event until at least 10 minutes after detonation. Lookouts will pay extra attention within the buffer zone to large amounts of floating kelp strands and other marine debris (if any), since these may provide shelter and food for prey.
- Divers placing charges on mines and dive support vessels will check the area immediately around the mine location for marine mammals.
- If a marine mammal or turtle is sighted within the buffer zone or moving towards it, exercises will be suspended until the animal has voluntarily left the area and the area is clear of marine mammals for at least 10 minutes.
- Immediately following the detonation, visual monitoring for marine mammals within the buffer zone will continue for 10 minutes. Any animals appearing will be observed for signs of injury. Injured marine mammals will be reported to the CNRSW Environmental Director, the PACFLT Environmental Office, and the NMFS Southwest Regional Office.

Mitigation for ELCAS/Pile Driving Activities on SSTC oceanside:

- The Navy proposes, under the associated SSTC marine mammal monitoring plan, to conduct underwater acoustic propagation monitoring during the first available ELCAS deployment at the SSTC under the Incidental Harassment Authorization application. This acoustic monitoring would provide empirical field data on ELCAS pile driving and removal underwater source levels, and propagation specific to ELCAS training at the SSTC. These results will be used to either confirm or refine the Navy's exposure predictions.

### 5.9.3 Alternative Mitigation Measures Considered but Eliminated

As described in Section 3.9.2.7 and 3.9.2.8, estimated sound exposures of marine mammals during proposed training activities are not expected to cause injury. Potential behavioral effects on marine mammals would be reduced by the mitigation measures described in Section 3.9.1.7 and 3.9.3. Therefore, the Navy concludes the Proposed Action and mitigation measures would achieve the least practical adverse impact on species or stocks of marine mammals.

A determination of "least practicable adverse impacts" includes consideration of personnel safety, practicality of implementation, and impact on the effectiveness of the military readiness activity in consultation with the DoD. Therefore, the following additional mitigation measures were analyzed and eliminated from further consideration:

- Visual monitoring using third-party observers from air or surface platforms.
  - Reliance on the availability of third-party personnel would also impact training flexibility, adversely affecting training effectiveness.
  - Some training events (e.g., ELCAS) will span extended 24-hour periods, with operations underway continuously in that timeframe. It is not feasible to maintain non-Navy surveillance of these activities, given the length of time the exercises are conducted.
  - Scheduling civilian vessels or aircraft to coincide with training events would impact training effectiveness, since exercise event timetables cannot be precisely fixed and are instead based on the free-flow development of tactical situations. Waiting for civilian aircraft or vessels to complete surveys, refuel, or be on station would slow the unceasing progress of the exercise and impact the effectiveness of the military readiness activity.
- Vessel speed: Establish and implement a set vessel speed.
  - Navy personnel are required to use caution and operate at a slow, safe speed consistent with mission and safety. Vessels need to be able to react to changing tactical situations in training as they would in actual combat. Placing arbitrary speed restrictions would not allow them to properly react to these situations, resulting in decreased training effectiveness and reduction the crew proficiency.
- Increasing buffer zones:
  - The current buffer zones were developed to minimize exposing marine mammals to sound levels that could cause temporary or permanent threshold shifts, levels that are supported by the scientific community. Implementation of the buffer zones discussed above will prevent exposure to sound levels that could cause Marine Mammal Protection Act Level A Harassment or injury for animals sighted. The safety range the Navy has developed is buffer zones within a range sailors can realistically maintain situational awareness and achieve visually during most sea conditions.

As discussed in Section 3.9.1.7, the Navy will monitor an ELCAS mitigation zone for the presence of marine mammals (before, during and after pile driving and removal events). If marine mammals are found in the mitigation zone, pile driving and removal will be halted until the marine mammals have voluntarily left the zone. Mitigation measures that other, generally longer term and much larger pier and bridge construction projects have implemented in the past are listed as follows, with an explanation of why the Navy is not proposing to implement them.

A significant reason for not considering these mitigations is that the engineering needed to both develop, and more importantly field deploy, these mitigations is often not available under the remote expeditionary nature that characterizes field training with the ELCAS. There is generally a lack of facility based infrastructure to support the mitigation deployment. In addition, these measures are part of a much longer term (sometime several years) projects where deployment time of the mitigation can be factored into a given construction project over several months. By contrast, an entire ELCAS training event from construction, to use, to disassembly usually is only scheduled to occur for periods of up to two to three weeks or shorter. Deploying of additional significant hardware-based mitigations would be impractical, nor meet the Navy’s Title 10 requirements for training. The range of additional ELCAS mitigations considered but rejected fall into two classes. One is deploying various engineering solutions such as sound dampening measure or material change, and the other is seasonal or daily restrictions.

The Navy asserts that sound dampening measures that other pier construction and repair projects have considered or used in the past that help to attenuate some sound from pile driving, are not practical for ELCAS training. These measures are not used in actual ELCAS operations overseas or easily adaptable for ELCAS training at SSTC. In addition, the purpose of ELCAS training is to teach personnel to construct an ELCAS as they would overseas in as quick a manner as possible. Adding in sound dampening measures that are not used in real world conditions would not only confuse personnel trying to learn and recertify their capabilities in ELCAS construction, but divert the limited amount of Navy personnel available to ELCAS support units away from necessary training while they implement these measures.

- *Bubble curtain* - Air bubble curtains infuse the area surrounding the pile with air bubbles, creating a bubble screen that inhibits the propagation of some sound from pile driving and removal. The effectiveness of air curtain design in reducing underwater sound propagation is highly variable ranging from reduction of zero to perhaps 15 dB in source level (CADOT 2009). However, the exact optimum design of air bubble curtains is still slightly qualitative, based on site conditions and engineering issues. As designed, there is no latitude in the ELCAS construction equipment to allow installation of bubble curtains. Typical bubble curtain arrangements for larger pier construction projects would not have the necessary support (power, air compressors, piping, etc.) found at remote ELCAS deployment sites within the SSTC.

- *Cofferdam* - Cofferdams are temporary structures used to isolate an area generally submerged underwater from the water column. Cofferdams are most commonly fabricated from sheet piling or inflatable water bladders. As designed, there is no latitude in the ELCAS construction equipment to allow installation of cofferdams;

- *Isolation casing* - Isolation casings are hollow casings slightly larger in diameter than the piling to be driven. The casing, typically a larger hollow pile, is inserted into the water column and bottom substrate. The casing then is dewatered, and the piling is driven within the dewatered isolation casing. As designed, there is no latitude in the ELCAS construction equipment to allow installation of isolation cases;

- *Cushion blocks* - Cushion blocks are blocks of material used with impact hammer pile drivers. They consist of blocks of material placed atop a piling during pile driving to minimize the noise generated while driving the pile. Materials typically used for cushion blocks include wood, nylon, and micarta blocks. The effectiveness of these materials within both the construction world and as potential ELCAS mitigation is not sufficiently studied, and its unknown if cushion blocks would effectively and significantly lower pile driving noise levels. Use of cushion blocks would require additional time to prepare and deploy on each ELCAS pile. The result could be significant time delays between individual ELCAS pile driving resulting is delays to the overall ELCAS training.

- *Changing pile material or size* - Different pile materials, such as concrete, and/or smaller piles could reduce the sound intensity and associated ZOIs during ELCAS construction at SSTC. The ELCAS, however, is a pre-manufactured system using 24 inch steel piles, designed for optimal operation overseas and deployment on specified Navy cargo ships. Navy personnel are not able to use incompatible piles in this pre-manufactured system, which might compromise the ELCAS’ military specifications and design.

Changing the time when pile driving or removal occurs is another construction based technique. The following are two temporal measures that other civilian pier construction and repair projects have considered or used in the past to help minimize impacts to marine mammals, but for which the Navy asserts are not practical for ELCAS training.

- *Constructing ELCAS at a different time of year* - Shifting ELCAS training to summer months may help with transitory migratory species, such as the gray whale, which are not present during the summer within Southern California. The actual amount of pile removal exposures for gray whales is very small, and as explained earlier much more easy to mitigate with the applicable mitigation zone. Navy training cycles and curriculums are set to a fixed annual training schedule, however, to ensure that personnel are adequately trained for deployment, and resources are available to conduct that training. Restricting ELCAS training to by season would adversely impact the Navy's ability to ensure that personnel are adequately prepared for deployment, while not lending significant protection to marine mammals.

- *Daylight Restriction* - Restricting ELCAS pile driving and removal to only daylight hours could conceivably avoid impact to marine mammals by making visual sighting within the ELCAS mitigation zone easier. However, ELCAS operations in real world conditions are performed 24 hours a day to enable forces to offload materials from the ship to shore (via the ELCAS) as quickly as possible. Sailors need to train for these real world conditions, including night-time operations. Navy training cycles and curriculums, as well as resulting field deployments to training sites such as the SSTC, are set to a fixed annual training schedule with daily milestones of accomplishments that also include night time training. In addition, while under construction, there is significant floodlight use both on the ELCAS itself and at the pile driving or removal location pointing into the water so that operators can observe the results of these events. This same lighting would afford additional sighting opportunities for marine mammals within the 50 yards ELCAS mitigation zone at night.

## 5.10 SEA TURTLES

The measures implemented by the Navy to reduce impacts to marine mammals, as discussed in Section 5.9, also serves to mitigate potential impacts on sea turtles. The measures listed above for marine mammals apply to sea turtles that may be present in the vicinity of the training activity. In particular, establishment of marine mammal exclusion zones for underwater detonations of explosives, and pile driving/removal activities and pre- and post-exercise surveys, all serve to reduce or eliminate potential impacts of Navy activities on sea turtles and that may be present in the vicinity.

As a result of the informal green sea turtle consultation with NMFS, the Navy will implement an additional mitigation measure:

- If there are sea turtles known to be equipped with sonic tags in the area of and during pile driving operations, Navy will collaborate with NMFS to analyze movements of these turtles in the immediate area during pile driving. Following any monitoring of sound attenuation associated with pile driving, the Navy will share the results with NMFS and provide recalculations of buffer zones as they are available.

## 5.11 TERRESTRIAL BIOLOGICAL RESOURCES

The following sections identify general and specific management and mitigation measures that take place for terrestrial resources. However, the largest benefit to natural resources has arisen from Navy control of the SSTC; this control precludes the development of these lands in a manner similar to adjacent properties. The Navy needs these lands for the open space for training; by restricting development and acting as a steward for the resources, the needs of sensitive habitats and special status species can be better met. The Navy's extensive and long-term engagement with its partner agencies in managing these resources has led to these natural resources thriving on Navy lands.

### 5.11.1 Integrated Natural Resources Management Plan

Navy natural resources are managed through Integrated Natural Resources Management Plans (INRMPs), which are intended to take an ecosystem approach to natural resources planning. These are long-term, collaborative strategies for managing natural resources as required by the Sikes Act Improvement Act of 1997 (SAIA). Conservation responsibilities for natural resources on all DoD installations are required by laws and Executive Orders, and specified in the relevant INRMPs' instructions and guidance. An INRMP's scope is largely defined by the SAIA, DoD Instruction 4715.3 (Naval Facilities Real Estate Manual), and the Navy's Environmental and Natural Resources Program Manual (OPNAVINST 5090.1 October 2007).

INRMPs are developed jointly by the Navy and fish and wildlife agencies such as the CDFG, USFWS, 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. For this reason, there is a long history of collaboration between the Navy and its agency partners in managing resources of the SSTC. As a result of this and the implementation of INRMP strategies by Navy natural resources professionals, the Navy management program is successful and occurs in a multiple-use environment. Terrestrial and marine aspects of natural resources management are addressed in the NBC INRMP. The NBC INRMP was completed in 2002 and is in the process of being revised; natural resources staff also provides day-to-day management based on current circumstances.

### 5.11.2 Terrestrial Habitat and Vegetation Management

Terrestrial habitats and vegetation have benefited from implementation of INRMP-funded projects such as invasive species control and habitat enhancement, but also as a collateral benefit of the long-term collaborative approach undertaken by the Navy and its partner agencies to protect nesting, federally listed birds (See Section 3.12).

The protected status of certain aquatic habitats under Section 404 of the Clean Water Act (CWA), as well as occupation of certain of these habitats by federally listed species (San Diego fairy shrimp and the clapper rail), have also framed the management of these areas. The jurisdictional status of wetlands and waters under Section 404 of the CWA drives certain management actions.

The Navy has an established management program for vegetation and soils. Revegetation and habitat enhancement are important elements of the Navy program, such as on the dunes and for vernal pools Vegetation management and erosion control plans are developed and implemented. Vegetation management includes survey and monitoring of federally listed and other special status species. It also includes a prioritization program for invasive species control. Invasive plant issues related to the implementation of specific projects or activities are minimized through pre-project planning. High-priority invasive plants are targeted for control. The current landscaping guidelines for CNRSW require that the NBC Botanist, NBC Wildlife Biologist, and Navy Landscape Architect review and approve the plant palettes for all landscaping projects at NBC. The landscaping guidelines prohibit the planting of species listed on the California Invasive Plant Council Invasive Plant Inventory, all non-native grasses (except those used for turf/lawns), and other non-native species observed or expected to have the potential to become invasive at the installation. Current management also includes delineation and monitoring of wetlands, and implementing avoidance and minimization measures as necessary to ensure no net loss of these areas under the CWA. Other management is accomplished through habitat protection as described above, and through public access limits to natural resource areas.

Elements of the California least tern and western snowy plover management program and the requirements of related Biological Opinions (BOs) dominate the Navy's natural resources strategy in the ROI, and therefore influence the habitat condition of vegetation, and the status of plant and other wildlife species. For instance, as stated below, vegetation and the soil substrate are prepared and managed to attract the least tern in designated nesting areas at Delta Beach North and South, while marking for avoidance special status plant species. In active training lanes where conflict may occur with operations, historic site preparation may include means to discourage nesting before the terns arrive in the spring, such as the creation of sand hummocks. In some cases, as at SSTC-S, vegetation such as iceplant is not cleared in case such clearing may attract terns to establish nests, and thus create a conflict with operations. At Naval Air Station, North Island (NASNI), vegetation is mowed consistent with Bird/Animal Aircraft Strike Hazard reduction while accommodating special status plants such as Brand's phacelia.

#### 5.11.2.1 Delta Beach North and South

Delta Beach North and Delta Beach South are managed as a preserve for the California least tern, although military training is not restricted outside of the nesting season. Past management measures of these lands that were partly created by fill have included grading, disking, fencing, signage, and herbicide application, Prior to disturbances such as grading or herbicide treatment, the locations of two sensitive plants, Nuttall's lotus and coast woolly-heads, are marked to minimize the impacts to these species. While the primary vegetation condition is sparse, low cover on the Delta beaches, tidal mudflats and salt marsh rim the shoreward edge of both properties. The marsh between Delta Beach North and South is about 12 acres in area. Approximately 9.8 acres of coastal dunes are graded annually at North Delta Beach.

#### 5.11.2.2 Dune Management

A dune management area along the ocean side of NASNI provides broad-based ecological benefits as a habitat restoration project.

A second dune restoration site (1.2 acres) is bayside at NASNI and is intended to restore sand verbena-beach bursage habitat and Nuttall's lotus individuals affected by the remediation of smelter slag wastes disposed at the site from 1943 to 1967 (AMEC 2003). Qualitative and quantitative monitoring is conducted. Maintenance and monitoring includes regularly maintaining the native dune habitat landscape and the evapotranspiration cover plant species in the Waste Consolidation Area.

Invasive species removal is a regular activity on all dune areas.

### 5.11.3 Habitat Areas that are Leased or Licensed

In the project area entire habitats are protected through special-purpose leases or licenses to the California Department of Parks and Recreation (CDPR), the City of Coronado for a South Bay Marine Biological Study Area, the City of Coronado for a dog walking beach, and the YMCA for a youth surf camp.

#### 5.11.3.1 South Bay Marine Biological Study Area

The South Bay Marine Biological Study Area (also called "South Bay Wildlife Preserve" or "Ecological Preserve" on some maps and signs) is a 27-acre site in the northeast corner of SSTC-S that has been leased to San Diego County since May 1972, but this lease has since been transferred to the City of Coronado (as of February 2009). As of 1974, the Navy has issued five-year licenses to San Diego County for "the establishment of an Educational Ecological Preserve which is open to the public," with use limited to the study of marine biology and open to the students of the Unified School Districts of San Diego County. As conditions of the lease, the Navy requires a parking limit of 50 cars, and compliance with the CWA's Section 404 conditions for wetlands. The site contains 26.35 acres of "federally protected wetlands" and the county cannot conduct any manipulation projects, including restoration, without a "Modification of License" from the U.S. Navy to ensure Section 404 permit compliance. The County Parks and Recreation Department manages the South Bay Marine Biological Study Area.

#### 5.11.3.2 YMCA Camp Surf

YMCA Camp Surf operates on the southwestern 45 acres of SSTC-S on land leased from the U.S. Navy in a long-term agreement that expires in 2048. For over 30 years the YMCA has served about 10,000 youth per year here. The YMCA remains responsible for the planning and management of the site and is liable for all activities on the site as well as those of any contractor used in the site's day-to-day operations.

The YMCA pays for their current lease by maintaining and enhancing the natural resources of the leased property, which includes maintenance of fences, invasive weed control, and signage.

#### 5.11.3.3 Lease to California Department of Parks and Recreation

The 40-acre NAB Coronado parcel leased to CDPR supports the wandering skipper, a Federal Species of Concern, and Brand's phacelia, which is a Federal Candidate Species for listing under the Endangered Species Act (ESA). The San Diego Coastal State Park System General Plan (1984) guides the management of the 40-acre parcel leased to CDPR. The purpose is to preserve and protect opportunities for the public to enjoy quality beaches and to provide recreational opportunities in the ocean and nearshore environments.

#### 5.11.3.4 Salt Pond Connection to South San Diego Bay NWR

A portion of SSTC-S that includes a salt pond and associated levee ("Pond 11" in the National Wildlife Refuge [NWR] Comprehensive Conservation Plan [CCP]; USFWS 2006)) is part of the NWR's Approved Acquisition Area. The USFWS may seek a lease agreement with the Navy in this area; at a minimum, the CCP states that the NWR may seek approval to alter the current conditions in the northwestern corner of Pond 11 (USFWS 2006). The Navy also owns and manages 35 acres of open water and associated intertidal habitat within the NWR's approved acquisition boundary. According to the CCP, no management actions are proposed for the NWR on submerged lands north of and adjacent to Emory Cove that would restrict Navy access to SSTC-S (USFWS 2006). However, the Navy provided comments on the NWR CCP regarding NWR plans in the vicinity of the Emory Cove as well as other areas that could result in habitat changes that affect Navy activities or that convert habitat for least terns and snowy plovers at the NWR (16 November 2001 Ser N45RN.tc/353; 23 August 2004 5216 Ser NOOC/43619; September 2005 Ser N45JNW.tc/0313). The Navy requested that the USFWS plans avoid reducing or modifying the amount of habitat available for the California least tern or western snowy plover such that Navy lands would have an higher proportion of available habitat for these species; that proposed NWR activities adjacent to and north of Emory Cove be modified; that all land and water owned by the Navy at SSTC-S be removed from the CCP; and that management recommendations that increase the presence of gull-billed terns be changed. In 2009, the USFWS, Port of San Diego, and California State Coastal Conservancy completed an Environmental Assessment for the restoration and enhancement of the South San Diego Bay wetlands, including restoration of Ponds 10 and 11. The planned restoration of these ponds includes returning much of the open water habitat to salt marsh by breaching the current levees and restoring tidal flows.

### 5.11.4 Species-Specific Management and Mitigation Measures

In addition to the current management elements of the Natural Resources Program (see Section 3.11.1.6), impacts are avoided or minimized through pre-project site approval and planning process. All species groups are managed through implementing habitat and species conservation guidelines and projects identified in the INRMPs. At a minimum an extensive invasive plant control program is implemented annually in the ROI. Natural resources staff adapts strategies based on the INRMP, personal observation, or new information such as resource inventories, weather, operational requirements, etc.

A Metro Area Instruction and Family Housing Occupant Handbook has been developed to advise personnel of what to do if they come in contact with sick, dead or injured wildlife. There is a DoD

Instruction, Chief of Naval Operations Letter (5090 Ser N456M/1U595820 of 10 Jan 2002), and NBC Instruction regarding pet management. Except for dogs restrained by fences in family housing areas, animals (including cats and birds) are not permitted to run loose on Navy property. Possession or feeding of wild animals (including feral animals), regardless of docility or tameness, is prohibited. All dogs must be licensed, registered with security, and confined to a leash. Stray/loose animals should be reported to San Diego County Animal Control or Station Police for violations of policy. The Family Housing Occupant Handbook contains guidelines for properly disposing of trash so as not to attract feral animals. NBC has a domestic cat management policy associated with the housing area. Cats are not allowed to be loose outdoors, nor may pet food be left outdoors.

A Metro Area Pest Management Plan (per OPNAVINST 6250.4B ) has been drafted that directs how the Navy uses pesticides and herbicides in the ROI, including means to protect non-target plants and wildlife. DoD and Navy policies require that use of pesticides is minimized on their property (OPNAVINST 5090.1 [30 October 2007]). The pest management plan incorporates new direction for management of invasives on DoD installations (Executive Order 13112 of February 3, 1999 and July 14, 2000 DoD implementing direction). Chapter 17 of OPNAVINST 5090.1 requires that the use of pesticides comply with applicable regulations to prevent pollution.

### 5.11.4.1 Special Status Plants

Three rare plants exist within the area of influence of the SSTC: Brand’s phacelia, coast wooly-heads and Nuttall’s lotus. All are considered rare by the California Native Plant Society, while Brand’s phacelia is a Federal Candidate species under the ESA. These special status plants are managed through habitat protection, described above, but most occur in areas that receive some degree of use. As part of the project siting process, avoidance measures are undertaken, where practicable, to protect these special status plants. Known locations are mapped, and site-specific surveys are conducted to confirm the locations of sensitive plants. Invasive plant control and some habitat enhancement are periodically undertaken by the Navy as part of INRMP project planning.

Specific mitigation measures from past projects are sometimes undertaken. When 14 acres of upland were excavated for the first nuclear carrier berthing project in 1995, the Navy agreed to establish a seed bank for Nuttall’s lotus. To minimize impacts to these species, locations of special status species are marked prior to routine grading on Delta Beach North and Delta Beach South. When herbicide is used, it is applied to target species only; weed crews are able to distinguish between target and non-target species.

Brand’s phacelia is an extremely rare species managed through habitat protection, inventory, and monitoring. It was recently listed as a Candidate species by the USFWS. When Brand’s phacelia was mapped on NASNI, the population number was estimated at approximately 5,000 individuals occurring on site in the ruderal habitat south of the airfield. This may be the largest known population within its range in the United States. The current mowing of the ruderal habitat around the airfield does not appear to negatively affect this species and may, in fact, reduce competition with non-native grasses. The iceplant spreading in the ruderal habitat may be of concern as it is unaffected by mowing. The Navy has been removing iceplant from this area for the past several years through a combination of herbicide application and hand-pulling. The newly discovered populations in Bravo and Charlie training areas receive similar management treatment through INRMP-funded inventory, monitoring, and invasive species control. The population that exists on the 40-acre lease is adjacent to Alpha training area, but is not part of the Proposed Action for this EIS.

### 5.11.4.2 Salt Marsh Bird’s Beak

The only federally listed plant in the ROI, salt marsh bird’s beak, is located on the YMCA Camp Surf leased property, and is protected with signage to prevent entry into the wetland area by YMCA staff members or campers. YMCA Camp Surf is not in the operations and training footprint of the SSTC. A 1998 report (RECON 1998) discussed this plant's distribution, pollinators, seed set, and general population health based on field work done in the mid-1990s. Because this species is federally listed as endangered, formal consultation with the USFWS under Section 7 of the ESA would be required prior to any potential impacts. Certain habitat restoration work done by the YMCA Camp Surf under their lease agreement benefits this species (Conkle 2006).

#### 5.11.4.3 Management of San Diego Fairy Shrimp

Management in the inland area of SSTC-S benefits the vernal pools:

- Prior to routing grading and/or herbicide application to reduce vegetation cover within the California least tern preserve, the locations of Nuttall's, coast woolly heads, and other desirable patches of native vegetation are marked to minimize impacts.

- Vernal pools in the inland area of SSTC-S that are occupied by San Diego fairy shrimp have undergone some restoration as a result of an incident during a training activity in which there was some damage to vernal pools.

Current management of vernal pools restricts all activities from the pools at all times. Vehicle traffic in the inland area of SSTC-S is always limited to roads. Vehicle traffic adjacent to vernal pools is limited to paved roads except by emergency vehicles (e.g. security, fire, and medical support) in emergency situations only.

### 5.11.5 Proposed Mitigation Measures

Current mitigation measures will be continued. Proposed mitigation measures for terrestrial biological resources under the Alternatives are summarized below.

Current natural resource protection measures would continue, such as those derived through Navy Instructions, ecosystem-based planning in the INRMPs, and the employment of best management practices and standard operating procedures to avoid and minimize environmental impacts. Existing measures include invasive species control, erosion control, inventory, monitoring, and habitat enhancement.

For the San Diego fairy shrimp, under the Proposed Action, the Navy will avoid vernal pools occupied by San Diego fairy shrimp and their watersheds when designating parachute drop zones in SSTC-S Inland. While the existing Kaufman Drop Zone overlaps several vernal pools, only the southern portion of the drop zone is used for activities, effectively avoiding vernal pools occupied by California fairy shrimp. Vernal pools will be identified to assure that drop zones are located at least 30 m (100 ft) from each occupied pool. The Navy will consider the location of vernal pools occupied by San Diego fairy shrimp and their watersheds when planning training involving off-road foot traffic at SSTC-S Inland. To the maximum extent consistent with training need, off-road foot traffic will avoid the occupied vernal pools and their watersheds. The Navy will avoid the occupied vernal pools and their watersheds adjacent to the road at SSTC-S Inland (i.e., pools 1 through 7, marked with flexi-stakes) year round to the maximum extent consistent with training need. Avoidance may be accomplished using markers, maps, GPS coordinates or any other means consistent with training needs.

The Navy will be completing and submitting a Vernal Pool Monitoring and Management Plan to the USFWS and the California Coastal Commission in order to help identify whether the impacts identified in this EIS remain at the low levels expected. The Plan will include focused invasive plant survey in the pools and their watersheds; plant, topographic, hydrological, and water quality surveys (including salinity); and protocol fairy shrimp surveys. The Vernal Pool Management and Monitoring Plan will list: 1) what criteria are used to determine that the pools are dry, and 2) who makes the “dry” determination, i.e., the qualifications of the person responsible for determining wet and dry conditions. Training would not be allowed in the remaining vernal pools when conditions are wet. Foot traffic would only be permitted in the pools when conditions are dry.

The Plan will identify measures to minimize the potential for adverse effects to fairy shrimp from weed abatement, pool restoration, or pool augmentation. The Navy will be establishing the baseline distribution and abundance of San Diego fairy shrimp and condition of the vernal pool habitat prior to initiating training activities in or around the vernal pools at SSTC-S Inland. The Navy will report monitoring results and any observed incidental take to the USFWS and the California Coastal Commission annually, and will adjust management to the vernal pools occupied by San Diego fairy shrimp to minimize any training impacts detected by monitoring. If impacts are more than the low levels anticipated or impacts could lead to the extirpation of fairy shrimp from any individual pool, then the Navy will reinitiate consultation with the USFWS.

Under the No Action Alternative and Alternative 1, Vehicle Patrolling and Lighter, Amphibious, Resupply, Cargo-5 ton (LARC V) Operator Training are limited to training lanes Yellow 1 and 2 and Green 1 and 2, and will not occur in Red, Blue, or Orange Beach Lanes. Training activity restrictions serve to minimize effects to terrestrial biological resources in these lanes. This mitigation measure only occurs under the No Action Alternative and Alternative 1.

Coincidental benefit to special status plants would occur through measures that are designed that may be implemented to support nesting by the California least tern and western snowy plover. For instance, the Long-term Site Enhancement Plan for the tern would benefit terrestrial plants and wildlife. In this scenario, the dunes on the windward (west) edges of Delta North and South would be enhanced for plovers, the least tern nesting area would be enhanced with sand, which also benefits special status plants.

## 5.12 BIRDS

The following describes efforts the Navy has undertaken to protect avian species listed under ESA present in military training areas. For over 30 years, the Navy has built a comprehensive program to protect and manage resources on SSTC and NASNI. The program has been adaptive in nature, adjusting to changes in natural resource conditions and training needs, and adding to and modifying management measures based on experience and past effectiveness. The Navy and USFWS have worked extensively together to hone these measures over the years.

### 5.12.1 California Least Tern and Western Snowy Plover Management

The following describes efforts the Navy has undertaken to protect avian species listed under ESA present in military training areas. For over 30 years, the Navy has built a comprehensive program to protect and manage resources on SSTC and NASNI. The program has been adaptive in nature, adjusting to changes in natural resource conditions and training needs, and adding to and modifying management measures based on experience and past effectiveness. The Navy and USFWS have worked extensively together to hone these measures over the years. The Navy’s current mitigation measures are discussed in Section 3.12.1.5. Areas mentioned in the following text are indicated on figures in the Terrestrial Section of this EIS, Figures 3.11-5, 3.11-6 and 3.11-7.

#### 5.12.1.1 Origin of the Navy’s Establishment of Protected Nesting Sites for Terns

The early days of the Navy’s tern management program originated with the construction of a helicopter Maintenance and Training (MAT) facility, including a Light Airborne Multipurpose System (LAMPS) MK III, that resulted in the loss of a nesting area and displacement of what was 13 tern nests in 1977, the year terns were first documented as nesting there. By 1979, according to the BO that was signed in 1980 (USFWS BO 1-1-80-F-18 5 March 1980), about 68 nests were located at the facility. A total of 63.45 acres were affected by the project, including 36 acres to resurface the asphalt.

In order to establish a defined site where the nests could be protected, a 21.55-acre area of the existing nesting area called the MAT site was preserved, indefinitely, for nesting terns at NASNI. An additional 29.2 acres were prepared on an annual basis as alternate nest sites, including predator and vegetation control, in the event the MAT site was not successful.

In addition to the sites at NASNI, the Navy agreed in a 1983 BO (USFWS BO 1-1-82-F-123 2 March 1983) to "exclude 75 acres of land at Delta Beach from public access by fencing for least terns under the terms of a Memorandum of Understanding between the USFWS and NAB Coronado…" The BO required that the area be "fenced and officially established as a nesting site." The designation of the Delta beaches as a "least tern preserve" was formalized in a 1984 MOU between the U.S. Navy and USFWS (DoN and USFWS 1984) that was drawn up to provide long-term management of the 75 acres identified for least tern nesting at the Delta beaches in the 1983 BO 1-F-82-F-123. The MOU did not intend to inhibit the use of Delta beaches for military maneuvers, but it attempted to restrict these maneuvers to the north and east perimeters during the nesting season. Up until the time of this BO and MOU, Delta Beach North had been used both for Navy training and as a public boat launching facility. Installing fencing around the area eliminated the site for use as a public boat launch facility. The Navy was required to address the loss of public recreational access to the site, and under a California Coastal Commission (CCC) Consistency Determination (CD-4-84 22 February 1984), was required to leased 40 acres of land (Alpha Beach) to the State of California to develop for park and recreation purposes. The Navy also graded a road to Alpha Beach to facilitate public access there.

The Navy implemented a number of measures to promote nesting at the Delta site. The Navy began controlling vegetation at the site to enhance suitability for terns which do not prefer highly vegetated areas for nesting habitat. The Navy also added sand to the site to enhancing the substrate for nesting. The Navy employed decoys on the site at the beginning of the nesting season to attract nesting terns to the protected site. The Navy also began a program for controlling predators on the site and a program for monitoring the site for nesting success.

#### 5.12.1.2 Navy Adaptation to the Expansion of Least Tern and Snowy Plover Nesting Colonies on SSTC

In 1994, California least terns began nesting on oceanside beaches where military training takes place. Protections had to be established to protect the terns, and this began the development and evolution of a series of adaptive set of measures, with each year bringing ever-increasing tern numbers and a new sets of circumstances. As nesting on oceanside training beaches continued to increase, the Navy adapted and improved their approach as a result of information gained from monitoring and experimentation.

In 1996, the Navy coned off 500 yards of Green 2 Beach from training activity to avoid incidental take of nests, and also added decoys to attract birds to a designated nesting area where they could be protected and training could continue unimpeded elsewhere (BO 1-6-97-F-37 2 June 1997). Around the same time, the Navy enhanced the substrate of Delta Beach South, which expanded that nesting area from 10 to 15 acres. This resulted in an increase from one nest to 21 nests at Delta Beach South, and the expansion of nesting on the oceanside beaches continued, amplifying the challenge of protecting the terns (Copper 2003).

In 1992, monitoring for western snowy plover nests began at SSTC-North (SSTC-N) oceanside beaches and the species was noted there and have nested in this area every year since. The Navy began establishing avoidance zones by emplacing stakes less than 30 meters around the nests which were avoided during training. 1,200 yards of Green Beach were coned off by the Navy to protect nesting in the lanes. Poles for powerlines along the Silver Strand Highway were also removed and the powerlines were placed underground to reduce perches for predators. The Navy also purchased receivers to monitor peregrine falcons and increased predator control on SSTC-N. Along the eastern boundary of SSTC-N oceanside beaches, the Navy installed no trespassing signs to deter the public from entering or wandering into the nesting area.

The Navy and USFWS continued to collaboratively re-think the strategy to protect terns. In 2000, the Navy added beach crossing lanes to allow training groups to move between the sand road near Highway 75 and the hard-packed area near the water's edge (BO 1-6-99-F-28 3 May 1999 and extensions in 2000 and 2001). This was to protect nesting birds from accidental disturbance or mortality due to military activities (there had been incidental take (mortality) due to military activities of one western snowy plover and several terns in 2000). The coning off of Green Beach was discontinued as attempts to attract the birds to this safe area had failed, and by then almost 50 percent of San Diego Bay Navy terns were on the oceanside beaches. The bright orange and large cones were abandoned in favor of smaller and more portable blue stakes. The blue color was selected as it was believed that the bright orange color of the cones might attract avian predators (primarily ravens and crows). Instead of coning off the entire beach, individual tern nests were marked with a three-foot stake, but this created confusion for operators as to where training was permitted to occur.

The Navy changed its strategy in 2002 when lanes Green 2 and Blue 1 became the focus of concern about nesting in needed training areas (BO 1-6-02-F-2645.1 16 April 2002). The beaches were raked with an instrument dragged behind a High Mobility Multipurpose Wheeled Vehicle to deter nesting in those lanes and eggs were collected if present during pre-raking surveys. Collected eggs were taken for care to Project Wildlife (a wildlife rehabilitation non-governmental organization). Raking continued as often as twice per day, with the intent of discouraging tern nesting without affecting plovers. Other measures to discourage nesting were also undertaken, such as placing wooden stakes with flagging. Beach raking was found to be labor intensive, costly, and ineffective since terns continued to attempt to nest behind the raking activity. Raking was abandoned after one year (2002) as ineffective. However, the Navy continued to collect eggs that were in harm's way and take them to Sea World to be hatched, where it was determined if the chicks could be reared in captivity. The Navy set aside three unraked lanes for nesting. Tern nests outside the three lanes were marked with tongue depressors and subject to incidental take. Plover nests continued to be afforded protection with marking and buffer distances of less than 30 meters; military personnel were instructed to avoid the staked areas. At the same time, efforts continued to attract the oceanside birds to nest on the Delta beaches. A fence was removed at Delta Beach South and grading was expanded to the entire southern site (Copper 2003). At the same time, the Navy also implemented efforts to retain washed-up vegetation on the oceanside beaches to promote foraging of western snowy plover where it didn't interfere with military operations.

Around 2003, it was determined that annual disking of the Delta sites to improve the substrate for nesting habitat was promoting undesirable weeds, so the Navy switched its practice of disking to grading the sites. Also, despite efforts to deconflict training activity on the beaches and attract the birds to the Delta nesting sites, there were double the birds on the oceanside beaches compared to the previous year. For unknown reasons, the training beaches continued to be preferred by the birds despite efforts at preparing the Delta beach sites and heavier training activity on the oceanside training lanes. Despite this, the Navy successfully avoided incidental take of the birds, which remained far below the incidental take authorized in its biological opinions.

Pursuant to BO FWS-SDG-3452.1, the Navy continued the seasonal restriction of training in the three beach lanes in 2003, with beach crossing lane alignments modified, as needed, to minimize the number of nests requiring relocation (15 May 2003). Trying another approach, a lane in front of Green 1, called the Alpha lane, was added to allow high tide crossing by training groups. Incidental take was permitted for up to 50 eggs to be collected and taken to Sea World for captive rearing. Up until the 2003 breeding season, predator management was conducted in all Navy nesting areas; however, in another effort to deter terns from nesting on the beach, predator control was discontinued on the NAB ocean beaches in 2003 (only conducted in Orange 1 and 2). The effort was undertaken as an experiment, to see if discontinuing predator control would deter terns and move to the safer Delta Beach areas to nest, as previous efforts had been costly and unsuccessful (Martin Kenney, pers. comm. 2004). A change in nesting pattern was never apparent, and predator management on all sites resumed in 2004. Around this time, the Navy also began installing mini-exclosures around western snowy plover nests to reduce predation on eggs and fledglings.

In 2005, the Navy worked to further improve its predator control efforts. Nixilite™ (a deterrent material applied to structures to prevent roosting and repel birds) was installed on the fence by Delta South to deter predators from perching on the fence and preying on nests on Delta South. The Navy also installed video and still cameras to better understand which species are predating on the terns. In a new approach to attract terns to where they could be protected, about 3,000 cubic yards of sand were added to Delta Beach to benefit the substrate conditions for both least tern and snowy plover nesting there. The Navy graded and topographically modified Green 1 and Green 2 with hummocks (small sand hills) to reduce their attractiveness for nesting; the hummocks were effective in deterring terns from nesting in that area. The Delta beaches, Blue 2, Orange 1, and Orange 2 were treated with herbicides to enhance nesting attractiveness. The same management strategies used in 2005 and 2006 were implemented in 2007 with an extension of the 2005 BO (FWS-SDG-3452.3 16 July 2007).

#### 5.12.1.3 Western Snowy Plover Management Evolution With Measures Adapted for NASNI Airfield and Expansion of the Navy Lodge

Two BOs discuss snowy plover management at NASNI and resulted in changes in the action area regarding how snowy plovers are managed. The BO on NASNI Ongoing Operations addressed Bird/Animal airstrike hazards on the runway, as well as recreational and military training use of the southern NASNI beaches) (FWS-SDG-3908.3 2005). One of the historic problems at NASNI has been plover nesting on the airfield runway to the north, which may be due to inadequate availability of alternative areas for the plovers closer to the shoreline. Also, in some years the southern beaches have narrowed and have been temporarily unsuitable for nesting. The Navy Lodge Expansion (BO FWS-SDG-3908.5 20 July 2005) addressed the expansion of the Navy Lodge and its potential effect on western snowy plovers that nest on adjacent beaches. Among other requirements, the BO required (1) continued marking for 30-meter diameter buffers and monitoring; (2) avoidance of staked areas when beach raking; (3) setting aside of 14.9 acres of suitable (and historically used) plover habitat as off-limits to foot traffic, vehicle traffic, beach raking, and pets during the snowy plover breeding season; (4) implementation of predator controls including anti-perch materials on buildings; (5) placement of signage and distribution of educational materials to patrons, employees, life guards; (6) training for construction workers; and (7) shielding of lighting away from the beach during nesting season. The CCC added a requirement in its Consistency Determination (CCC ND-93-05 15 December 2005) as follows: “During the plover nesting season (March 1 through August 15), the Navy agrees to monitor the beach for plover nests in front of the NASNI Navy Lodge prior to each raking event. However if our [i.e. Navy] natural resources personnel determine that our efforts are meeting the objectives set forth in our BOs, specifically that NASNI supports 12-13 pairs or a maximum number of 12 nests. The Navy, at its discretion, may refrain from monitoring prior to raking.” The stated informal management objective of 12-13 nesting pairs (20 breeding season adults) for NASNI is carried forward in the Final Recovery Plan for the western snowy plover (Unit CA-127 in USFWS 2007b).

#### 5.12.1.4 Other Navy Agreements Related to California Least Terns

The Navy’s management measures for the California least tern and western snowy plover with regard to training activities in the SSTC are covered above. In addition to these measures, further avoidance and minimization measures are undertaken for past military construction projects, and for routine in-water construction and maintenance works. Two important elements of the Navy program are described below.

**In-Water Construction Noise and Turbidity Programmatic Agreement.** A programmatic agreement between the USFWS and the U.S. Navy establishes standards and conditions for in-water construction activities in San Diego Bay to protect the endangered California least tern (DoN and USFWS 1987, 1993, 1999, 2000, 2004). Originally a five-year Memorandum of Understanding (MOU), it was most recently renewed for two years in 2004, and a letter from USFWS allows for recognition of that MOU until a new one is signed (Letter from Therese O'Rourke to Capt. Anthony T. Gaiani FWS-SDG-08B0211-08I0203 December 18, 2007). This MOU was developed concurrently with the development and improvement of the management program on SSTC, and many of the protective measures described above were formalized in this MOU agreement. The MOU provided an additional 10 acres of tern nesting area at South Delta Beach, as well as an additional three to five acres of California least tern foraging habitat, the removal of overhead power lines at Delta Beach, predator control efforts for tern colonies, studies to determine effects of various in-water construction activities, end-of-year reports on tern population monitoring, and a list of proposed U.S. Navy projects to be conducted in San Diego Bay. In exchange, ongoing maintenance and new construction activities could be conducted by the U.S. Navy in San Diego Bay without the need for formal consultation with USFWS on each activity as long as specific, delineated least tern foraging areas were not affected. Under the agreement, the U.S. Navy provides an annual funding source of $250,000 for management and monitoring of the least tern, as well as a one-time funding source of $500,000 to be used to create additional tern foraging or nesting habitat. In addition, the U.S. Navy provides a permanent position within the U.S. Navy to oversee the implementation of the MOU. The 1987 MOU was updated in 1993 and provided for annual funding by the U.S. Navy to continue least tern management and predator control.

The western snowy plover derives coincident benefit from the California least tern protection measures afforded through the Navy-USFWS MOU on in-water construction activities, as well as other measures that enhance nesting success in the same locations where the plovers nest.

**Fiddler's Cove Surface Coverage Biological Opinion.** A BO addressing marina repairs and improvements at Fiddler's Cove was issued in 2007 regarding least tern foraging concerns (FWS-SDG-4032.6). These concerns arose as the result of the development of additional dock structures in Fiddler's Cove Marina that would cover bay waters adjacent to the Delta South least tern colony. The USFWS determined that this project would not result in any incidental take of the California least tern, but noted that the significance of any future net losses of such habitat on the survival and recovery of the species would be magnified, given the importance of protecting or enhancing high quality foraging habitat in San Diego Bay in close proximity to nesting colonies.

Based on the management experience gained by the Navy and its agency partners over the years, the following sections list current management that would be carried forward under the No Action Alternative for both the least tern and snowy plover on training beaches. Modifications to this management under Alternatives 1 and 2 are discussed in Sections 3.12.2.3 and 3.12.2.4, respectively. Management measures have been adaptive in the past and will continue to be in the future as changing circumstances dictate a modified approach.

### 5.12.1.5 Beach Lane Seasonal Conservation Areas and Marking/Avoidance Measures

- Two bayside training areas (Delta North and South) of beachfront Navy-administered lands are restricted from military foot and vehicle traffic during the breeding seasons of western snowy plover and California least tern except for a Beach Crossing Lane on South Delta. Access to the three oceanside lanes (Blue 2, Orange 1, and Orange 2), which under current management measures are set aside during the breeding season, will be modified by the two access criteria discussed in Section 3.12.2.3 for Alternative 1. When restricted from use, the perimeter of the oceanside training lanes is delineated with blue flexi-stakes or cones when terns first arrive. No military training is permitted within the protected areas except for designated beach crossing lanes. Since plovers nest individually or in loose groups rather than in dense colonies like the terns do, plover nest scrapes are marked with approximately 30-meter buffers for avoidance beginning approximately March 1. The beach crossing lanes are positioned to avoid the largest number of nests that would require relocation. Beach crossing lanes are marked with stakes for their entire length. Differences in training lane access do occur between the alternatives in this EIS, such that all SSTC-N surfside beach training areas would be available for use under Alternative 2, regardless of time of year, whereas usage is dependent on training needs in Alternative 1.

- Beach scheduling procedures bias activities with heavier beach use towards beach lanes with fewer nests, when it does not impact the realism of training or training needs.
- Plover nests are marked except in the training lanes set aside during nesting season. A surrounding buffer area of approximately 30 meters, or smaller, is also marked with blue flexi-stakes which are removed seven days after hatching, or when biologically practical to minimize impacts to plovers. No military training is permitted to occur within the delineated buffer or protected areas. Under Alternative 1 and 2, the Navy will limit the number of western snowy plover nests that will be marked and buffered for avoidance on SSTC-N and SSTC-S oceanside beaches to no more than 22 concurrent nests plus any additional nests that exceed 22 that are initiated in beach lanes Orange 1 and Orange 2.
- Also depending on site-specific circumstances, some plover nests are covered with a mini-enclosures (MEs) to protect from mammalian and avian predators. Once chicks hatch, markers and MEs are removed within seven days, or when biologically practical to minimize impacts to plovers. The MEs are not installed when the risk of attracting humans that will potential disturb the nest appears to outweigh the risk of predation.
- Due to the high predation rate from gull-billed terns, “wickets” or domes are used to offset predation by this species. Wickets are made of two pieces of small gage wire and formed into a one-foot dome. Domes are placed over least tern nests to discourage gull-billed terns from preying on eggs or chicks and/or destroying eggs when feeding from flight. A study on the effectiveness of domes that documents reproductive success of the terns with domes is being funded by the Navy. Due to this study wickets or any other form of exclusion that is developed will be used unless they are determined to be ineffective.
- To reduce harassment of nesting plovers, symbolic fencing with blue stakes (fencing that marks the area for people to avoid but does not prevent birds from entering or leaving) is practiced on NASNI in front of the golf course, building 710 of Breakers Beach (the recreational beach), and the Small Arms Range surface danger zone.

#### 5.12.1.6 Communication of Training Area Protocols

- The Navy works to ensure effective communication and coordination among the biological monitors, the Natural Resource Office, and the scheduling commands for NASNI, SSTC-N and SSTC-S. Beach users are informed: (1) that blue flexi-stakes or cones denote the boundaries of nests or protected nesting areas for least terns and snowy plovers; (2) that the presence of tongue depressors within beach lanes mark the location of least tern nests; (3) which training areas are authorized; and (4) that take of least terns and snowy plovers at SSTC-N and SSTC-S shall be avoided to the extent consistent with effective, realistic training. These access restrictions will be modified and communicated as necessary as the Navy meets criteria and thresholds for opening additional lanes.

### 5.12.1.7 Nest Relocation

- Nests may be moved small distances, as necessary and appropriate, to reduce conflicts with training, although such moving is infrequent. Snowy plover and least tern nests located in the Beach Crossing Lanes are relocated to safe areas as conflict is expected, and nests have been relocated due to the threat of flooding. The Navy contacts the USFWS and reports the circumstance that necessitated movement of any tern or plover nest. This is done with submittal of the Navy's weekly reports to the USFWS Carlsbad Field Office. If relocation is necessary, nests are moved the shortest distance possible into suitable habitat to increase the chances for nest success.

### 5.12.1.8 Predator Management and Control

- Predator control of mammalian and avian predators of the least tern and snowy plover is conducted at all nesting sites. Due to the rarity and overall status of the gull-billed tern, management of this known predator has not been possible. To date, the Navy has not been authorized to capture, relocate, shoot, or otherwise deter this species although annual Migratory Bird Depredation permit applications have been submitted to the USFWS since 2005. Isolated attempts by U.S. Department of Agriculture (USDA) Wildlife Services to discourage gull-billed terns from entering least tern nesting colonies were considered ineffective.

- The Navy has been using pole traps on and off since the inception of the program dependent on discussions with the USDA and the USFWS. These pole traps are designed to catch avian predators that prey on least tern and plover chicks, such as the gull billed tern.

- Predator control to manage southern fire ants, field ants, Argentine ants, and pyramid ants found on North and South Delta Beaches and NASNI is conducted prior to and during the snowy plover and least tern nesting season.

- The Navy, USFWS, and CDFG work cooperatively each season regarding the relocation of American peregrine falcons if they are determined to be impacting the least tern or snowy plover.

- In cooperation with USFWS Refuges, peregrine falcons are removed and relocated if necessary from Navy California least tern nesting sites, as described in the 2005 Training BO (FWS-SDG-3452.3 10 March 2005), under the USFWS take permit.

- Cameras are used to monitor least tern colonies on Navy property for predators. Cameras are also used as a tool for monitoring, specifically collecting status information.

### 5.12.1.9 Nesting Deterrence through Habitat Modification and Harassment

- Sand hummocks or other substrate modification may occur in the Green Beach Lanes prior to the breeding season to discourage nesting there. If necessary, sand hummocks or other substrate modification may be considered for other lanes, in a manner that is compatible with military training requirements.

### 5.12.1.10 Continued Site Preparation for Maintenance

- Site preparation, in accordance with the USFWS's BO on the MAT Development Program (1980-BO 1-1-80-F-18; 1983-BO 1-1-82-F-123 Navy's LAMPS MKIII facilities development program) and the California least tern MOUs, is performed on North and South Delta Beach and NASNI. Continued maintenance of these sites offsets the effects of previous construction projects and associated loss of habitat at NASNI as well as some of the effects of the current Proposed Action.

Site preparation includes grading or mowing to remove annual plant growth, inspection, replacement or reinstallation of the site grid poles and of chick barriers around the site perimeter, use of tern decoys, and placement of chick shelters throughout the nesting colony.

- Sand enhancement of nesting sites occurs as feasible.

- Although site preparation was discontinued on all NASNI alternate nest sites in the past, it will continue at the current alternate nest site north of Weapons as an experiment in the event that the MAT site needs to be moved.
- In order to provide nesting cover for chicks, minimize invasive weeds, and protect rare plants, the locations of coastal woolly-heads (*Nemacaulis denudata*), and Nuttall's lotus (*Lotus nuttallianus*), are marked for avoidance prior to grading or herbicide use. Coast woolly-heads and Nuttall's lotus are indicators of a healthy, natural habitat that is conducive to nesting by providing a mosaic of vegetation for chick shelter and escape cover.

- No kelp or other natural marine vegetation that collects on beach tidal areas is removed from the oceanside beaches of SSTC-N or SSTC-S. Kelp is managed at YMCA Camp Surf by relocating it to areas where it does not provide an unsafe environment for children. All marine vegetation at YMCA Camp Surf is not buried, but it is left on the surface for use as forage material by plovers.

- Mowing is practiced at NASNI airfield to maintain a habitat condition that is not preferred by nesting birds, in order to deter bird-related airstrikes. Areas within and adjacent to the airfield are mowed when 25 percent of the vegetation reaches eight inches or higher as measured from the soil. The mowing schedule is coordinated with the NBC Botanist and Wildlife Biologist.

- Beach cleanup in targeted areas will be conducted.

#### 5.12.1.11 Nest Substrate Enhancement

- In order to provide suitable nesting substrate that does not foster weed invasion that may harm nesting or fledging success, the Navy treats invasive exotic plants. Because iceplant can help dune stabilization and removal can be expensive, some iceplant may be left in place. This iceplant may be subsequently removed when money is available for natives to be planted at the site.

- Substrate enhancement of nesting sites occurs as opportunities arise with available sand or dredge spoil.

#### 5.12.1.12 Signage and Education

- Signs have been positioned every 500 feet on the sand road that parallels State Route (SR)-75. They inform the public of the need to avoid areas marked that designate nesting locations of snowy plovers or least terns on the beach.

- Signs are also placed at South Delta such as the large sign informing about least terns. Most plover areas also include a sign to explain the blue stakes.

- Signs are occasionally provided by State Parks to help with managing trespassers at Orange Beach and north of SSTC-S.

- An interpretive sign on least terns and snowy plovers is in development for the bike trail near South Delta Beach.

#### 5.12.1.13 Recreational Use Restriction

- The Navy works to eliminate recreational or casual use of the beaches by military personnel and their dependents who live in the Naval housing that is across SR-75 from Blue 2, Orange 1, and Orange 2. An annual letter is sent out to educate military housing residents about recreational use restrictions. In addition, the Navy works to eliminate nonmilitary civilian use of nesting beaches through security patrols and guards. Signage, fencing, public awareness campaigns, and/or enforcement are all necessary to achieve successful control.

#### 5.12.1.14 Rearing of Collected Eggs, Injured, and Sick Individuals

- All injured or sick individuals are taken to a wildlife rehabilitation center, preferably Project Wildlife, for rehabilitation.

- If needed, least tern eggs that have been collected are provided to Project Wildlife or Sea World, as appropriate, for hatching and rearing. Terns were reared in captivity in 2002 and 2003 after the eggs were collected to discourage nesting on the operational beaches. The least tern chicks proved very difficult to raise, whereas snowy plover chicks, which are precocial, are easier to raise. Tern survival after rehabilitation proved to be minimal if at all. All chicks are released in areas approved by the Navy with guaranteed predator management.

- The success of reared western snowy plovers as adults is tracked and evaluated to develop more effective rearing methods, with a few releases that were preliminarily successful.

#### 5.12.1.15 Western Snowy Plover Health Study

- Due to an unknown cause of mortality in adult snowy plovers in and around San Diego Bay that began in 2005, the Navy supports studies and efforts by the USFWS to determine the cause of the mortality.

#### 5.12.1.16 Monitoring for Effects and Adaptive Management

- California least terns and WSP are monitored for take at all San Diego Bay NBC training locations. The Navy prepares an end of the year report that documents, at a minimum, the locations of nests collected, number of nests/eggs collected, the hatch date of each egg collected, the unique band combination given each captive-reared chick, the approximate fledgling date and the release date/location of each fledglings, and suggestions to improve the efficacy of this process if used in future years. This information is necessary to assess the amount of incidental take, and the effectiveness of using this approach to minimize impacts.

- Biological monitoring of the least tern and the snowy plover during the breeding season is performed by qualified and USFWS-permitted experts at all nesting sites. The general schedule for monitoring is provided below but is modified based on findings in the field and/or operational requirements.

    - NAB Ocean Beach: Monitoring for least terns and snowy plovers is conducted three to four days each week from March 1 to April 15, five to six days per week from April 15 to August 1, and three to four days per week from August 1 to August 31.

    - NAB North and South Delta Beach: Monitoring for least terns and snowy plovers is conducted three days a week from April 15 to April 30, four to five days a week from April 30 to July 31, and three days a week from July 31 to August 31.

  - Monitoring for snowy plover occurs one day per week from September through February.

  - Monitoring at SSTC-S for snowy plovers is conducted one to three days a week from March 1 to mid-September (and one day per week during the winter).

- Banding of least tern and snowy plover adults and chicks is done in conjunction with monitoring of nests at NASNI, SSTC-N and SSTC-S. Due to the large number of nests that must be monitored and the number of quality bands received from the USFWS, not all adults or chicks are banded. Any least tern or snowy plover nest relocations are reported to the USFWS Carlsbad Field Office. Semi-monthly and annual reports are provided to the USFWS.

- A California least tern foraging study was conducted in 2009 to examine foraging patterns to evaluate if certain areas have higher foraging value than others. This study report is currently under preparation.

### 5.12.2 Light-Footed Clapper Rail Management

Since the light-footed clapper rail is listed as federally endangered, formal consultation with the USFWS under Section 7 of the ESA is required prior to any potential impacts to this species. The Navy currently does not conduct activities at the location where this species may breed, which is leased to the County of San Diego for the South Bay Marine Biological Study Area. Periodic surveys are conducted to determine species presence and breeding status.

Management of the clapper rail is addressed in the NBC INRMP with a program at Naval Outlying Landing Field (NOLF) Imperial Beach driving the management of this species at SSTC-S. The NOLF Imperial Beach program was established in 1992 through an MOU between the U.S. Navy and the USFWS. The focus of management is a little over 600 acres of the south and west NOLF Imperial Beach property that is managed as part of the Tijuana River National Estuarine Research Reserve and Tijuana Slough National Wildlife Refuge. The MOU is reviewed for renewal every five years.

The NBC INRMP identifies three primary approaches for protecting the light-footed clapper rail:

1. Develop and participate with other agencies in a regional approach and formal agreements for conserving salt marsh across the species' range in the context of local land use requirements;

2. Protect cordgrass sites from erosion; and

3. Improve nesting and foraging opportunities when habitat restoration or creation projects are undertaken. The Navy has participated as a partner in the light-footed clapper rail captive propagation program at the Sweetwater Marsh NWR (USFWS 2006).

#### 5.12.2.1 Underwater Detonation Measures

A buffer zone is established around each detonation point. This buffer is 1,200 feet for detonations occurring in zero to 24 feet of water depth and 1,500 feet for detonations in 24 to 72 feet of water depth. Observer(s) (two per activity) with binoculars and small craft survey the detonation area and buffer zone for birds. If flocks of birds or foraging birds are sighted within the buffer zone or moving towards it, activities are suspended until the birds voluntarily leave the area. Immediately following the detonation, visual monitoring for birds within the buffer zone takes place for 30 minutes. Observations are made for animals with signs of injury; injured animals are reported to the NRSW Environmental Director and the PACFLT Environmental Office. Sequential detonations are conducted either less than 10 seconds apart or greater than 30 minutes apart to allow for birds attracted by fish kill to vacate the area.

### 5.12.3 Proposed Mitigation Measures

All listed species management measures currently employed under No Action alternative are in accordance with previous USFWS Biological Opinions (as described in detail in Section 3.12.1.5) and will continue, with the exception of lane management of SSTC-N training lanes Blue 2 through Orange 2 as previously described in 3.12.1.5.3. In addition, the following mitigation measures are proposed, which are consistent with the USFWS Biological Opinion on SSTC operations (FWS-SDG-08B0503-09F0517).

#### 5.12.3.1 California Least Tern and Western Snowy Plover Measures

Due to anticipated impacts to California least tern and western snowy plover from the action alternatives and following consultation with USFWS resulting in a signed Biological Opinion (July 7, 2010), the following measures will be implemented to minimize and manage these impacts:

- Develop and implement a Long-term Site Enhancement Plan that includes invasive vegetation control on SSTC oceanside beach lanes, establishing dunes on the windward (west) edges of Delta North and South that would enhance this area for plovers, create a source of sand for the least tern nesting area, and establish a better visual barrier between SR-75 and the nesting colony.

- Install temporary barriers and improved signage on the southern end of SSTC-N to more clearly notify the public of the Navy's exclusive use of SSTC-N beach and existing restrictions on public usage of those beaches.

- The Navy will consider the tide conditions when developing training schedules, and schedule training activities that could be conducted on the hardpack during low tides when consistent with training needs.

- The Navy will mark and buffer up to 22 concurrent snowy plover nests established at SSTC-N and SSTC-S beaches plus any additional nests that exceed 22 that are initiated in beach lanes Orange 1 and Orange 2.

- Under baseline conditions, the southern 3 beach lanes are marked to facilitate avoidance of tern and plover nests. The Navy is developing a marking strategy to delineate least tern and snowy plover nesting areas that does not encumber training activities. Such a marking strategy may entail signage affixed to existing beach lane sign posts and a limited number of additional markers.

- If relocation of any least tern or snowy plover nest/egg is necessary as a protective measure, each nest/egg will be relocated the shortest distance possible into suitable habitat by Service-approved monitors to increase the chances for nest success. The weekly reports to be submitted to the CFWO under the proposed project will include: a) date the nests/eggs were moved, b) number of nests/eggs moved, c) original and ending location of nests/eggs moved, and (d) distance the nests/eggs were moved.

- The Navy will delineate the boundary of SSTC-S that parallels the mean high tide line in a manner that does not encumber training exercises.

- The NBC Natural Resources staff will brief all dog handlers annually, or more frequently if necessary, of guidelines pertaining to the use of military working dogs on SSTC beaches.

- Military working dog handlers will be notified weekly of the locations of plover nests and, to the maximum extent possible, remain a minimum of 30 m (90 ft) from markers that delineate the locations of nesting plovers. Outside of the nesting season (15 Sept through end of February), training may occur unencumbered.

- If physical conditioning on soft pack sand is necessary, handlers and military working dogs will run on the sand road (SSTC-N only) or within 20 feet of the hard pack sand (SSTC-S only) to reduce the disturbance and impact to nesting terns and plovers.

- At SSTC-N, military working dogs will exercise primarily between beach lanes Yellow 1 and Blue 1, where they may cross the beach to get to the sand road at the existing route immediately to the north of the demo pit. The Navy will not conduct physical conditioning using dogs in the southern three beach lanes until: a) completing a study to evaluate the effects of military working dogs on terns and plovers and b) coordinating with the USFWS to develop conservation measures to minimize any additional effects.

- If military working dog training is requested as part of Platoon Over-the-Beach activities at SSTC-N, these activities will be scheduled in beach lanes Yellow 1, the north half of Yellow 2, Green 1 or Green 2, pending the results of the Navy’s study to evaluate the response of terns and plovers to military working dog presence.

- The Navy will coordinate with the Service in the development of the study to evaluate the effects of military working dogs on terns and plovers and will submit the study design and scope of work to the Service for review and approval. The Navy will allow the Service 30 days to submit comments and an additional 30 days to approve the final study design and scope of work.

- The Navy will coordinate with the Service in the development of the Long Term Habitat Enhancement Plan for SSTC and will submit the plan to the Service for review and approval. The Navy will allow the Service 30 days to submit comments and an additional 30 days to approve the final study design and scope of work.

- The Navy will include the following information in the yearly reports to be submitted to the USFWS under the proposed project: a) the number and distribution of terns and plovers observed in each training lane; b) the number of any dead or injured least terns or snowy plovers (including eggs, chicks or adults) observed in each training lane; c) the hatching rate of terns and plovers in each beach lane; d) maps of the locations of tern and plover roosts within the action area; e) the timing and number of training events within the southern 3 beach lanes, and other beach lanes, to the extent available; f) the date and condition of any dead or injured tern or plover; and g) any measures taken to prevent additional tern or plover death or injury.

- The Navy will ensure that biological monitors look for and document the location of least tern or snowy plover nests, eggs and chicks prior to and after all military training exercises, to allow assessment of take associated with training activities.

- The Navy will provide California Coastal Commission staff monitoring reports prepared for the U.S. Fish and Wildlife Service under the July 7, 2010 Biological Opinion.

- Consistent with other applicable laws and to the extent possible and practical, the Navy will maintain signs and enforce the existing ban on the public bringing non-military working dogs to Navy-controlled beaches.

#### 5.12.3.2 Training Activity Restrictions

Vehicle Patrolling and LARC V Operator Training. Vehicle patrolling and LARC V Operator training will not occur in Red, Blue, or Orange Beach Lanes**.**

## 5.13 CULTURAL RESOURCES

The Navy strives to ensure that it retains access to ocean training areas as necessary to accomplish its mission, while facilitating joint military-civilian use of such areas to the extent practicable and consistent with safety. These goals of military access, joint use, and safety are promoted through various coordination and outreach measures. The Navy currently employs the following management practices to avoid impacts to cultural resources:

- Restrict digging near any cultural resource site that is known to be eligible for listing in the National Register of Historic Places (NRHP).
- Limit operational training access on or across the recorded areas of eligible or potentially eligible archaeological sites to foot traffic only.
- No alteration or damage to the appearance, structure, or features of NRHP-eligible built properties is permitted without appropriate Section 106 review and compliance.

Specifically, digging would be restricted (whether as a part of a training activity or infrastructure development) at site CA-SDI-5454/12,270, which is a site formally determined to be eligible for listing on the NRHP. This site contains prehistoric human remains and is thus subject to the provisions of the Native American Graves Protection.

For the Single Anchor Leg Moor component of Offshore Petroleum Discharge System the Navy procedure is to send down a diver to reconnoiter the bottom. This procedure avoids fouling of ground tackle and avoids impacts to submerged cultural resources. During other vessel activities, it is current practice that navigators avoid known obstructions and shipwrecks.

Current mitigation measures to avoid impacts to cultural resources will continue to be implemented under the action alternatives.

## 5.14 TRANSPORTATION AND CIRCULATION

The Navy strives to ensure that it retains access to oceanside and bayside training areas as necessary to accomplish its mission, while facilitating joint military-civilian use of such areas to the extent practicable and consistent with safety. These goals of military access, joint use, and safety are promoted through various coordination and outreach measures, including publication of potentially hazardous activities planned for the oceanside and bayside areas through Notices to Mariners issued by the U.S. Coast Guard.

Current measures, which facilitate joint military-civilian use of SSTC consistent with safety, would continue.

## 5.15 SOCIOECONOMICS, ENVIRONMENTAL JUSTICE AND PROTECTION OF CHILDREN

There are no current mitigation measures related to socioeconomics, environmental justice, and protection of children. However, the Navy strives to be a good neighbor to the community by maintaining, to the greatest extent practicable, land use compatibility with the surrounding neighborhood and providing public access whenever possible. The Navy recognizes the importance of public access and works with the community to ensure access to the public beach areas. Mitigation measures in place for other resources (e.g., Water Resources [Section 3.5], Acoustic Environment [Section 3.6], and Public Health and Safety [Section 3.16]) also ensure that non-participants, including children, are not affected by Navy actions.

## 5.16 PUBLIC HEALTH AND SAFETY

The Navy has specific and documented procedures in place to ensure that nonparticipants are not endangered by Navy actions. Emergency medical personnel and first aid kits are on site for each training activity in the unlikely event of an injury.

### 5.16.1 Exercise Planning

The Navy considers public safety in planning its exercises. Factors considered in evaluating the impact of the training on public safety include proximity of the activity to public areas; access control; schedule (time of day, day of week); public notification; frequency, duration, and intensity of activities; range safety procedures; operational control of hazardous activities or events; and safety history.

### 5.16.2 Range Control

Current range control procedures at SSTC-N and SSTC-S limit the potential for unanticipated interactions with the public. On SSTC-N bayside, a fence parallel to Silver Strand Highway from Rendova Housing to Fiddler’s Cove prevents public access from the land to bayside training areas. Oceanside access to the beach is controlled by a watch guard posted on the northern edge of Yellow 1. SSTC-S inland areas are fully fenced. Entrance into this area is controlled by manned gates. During all land and water training activities, trainers and exercise participants are responsible for assuring that nonparticipants are not close enough for their safety to be at risk.

### 5.16.3 Range Inspection

Range users are instructed to discuss planned activities with the range scheduling activity to ensure the current and applicable range inspection procedures are applied prior to conducting any activities. Scheduling officials regularly inspect beach areas.

### 5.16.4 Coordination Procedures

Close coordination between military and civilian facilities enables effective real-time shared use. Notices to Mariners are issued for all underwater detonation activities. An individual activity must be coordinated between the appropriate range scheduling activity and range user at the time the range is scheduled for the operation.

# 6 Other Considerations

# 6 OTHER CONSIDERATIONS REQUIRED BY NEPA

## 6.1 POSSIBLE CONFLICTS WITH OBJECTIVES OF FEDERAL, STATE, AND LOCAL PLANS, POLICIES, AND CONTROLS

Implementation of the Navy's alternatives, including the Proposed Action for the Silver Strand Training Complex (SSTC) Environmental Impact Statement (EIS), would not conflict with the objectives or requirements of Federal, state, regional, or local plans, policies, or legal requirements. The Navy has consulted with regulatory agencies as appropriate during the National Environmental Policy Act (NEPA) process and prior to implementation of the Proposed Action to ensure requirements are met. Table 6-1 provides a summary of environmental compliance requirements that may apply. Appendix G provides a list of the Silver Strand Training Complex (SSTC) regulatory agency consultation documentation. Agency correspondence and supporting documentation can be found on the SSTC EIS website at www.silverstrandtrainingcomplexeis.com.

**Table 6-1: Summary of Environmental Compliance for the Proposed Action**

| Plans, Policies, and Controls | Responsible Agency | Status of Compliance |
|---|---|---|
| NEPA of 1969 (42 United States Code [U.S.C] §§ 4321 *et seq*.); Council on Environmental Quality (CEQ) Regulations for Implementing the Procedural Provisions of NEPA (40 Code of Federal Regulations [C.F.R.] §§ 1500-1508); Department of the Navy Procedures for Implementing NEPA (32 C.F.R. § 775) | U.S. Navy | This EIS has been prepared in accordance with NEPA, CEQ regulations, and Navy NEPA procedures. Public participation and review has been conducted in compliance with NEPA. |
| Clean Air Act (CAA) (42 USC §§ 7401 *et seq*.); CAA General Conformity Rule (40 C.F.R. § 93[B]); State Implementation Plan (SIP) | U.S. Environmental Protection Agency (USEPA) and San Diego Air Pollution Control District | The Proposed Action would be compatible with attainment and maintenance goals established in the SIP. A CAA conformity determination will not be required because emissions attributable to the alternatives including the Proposed Action would be below the *de minimis* thresholds for requiring a full conformity determination, and the General Conformity Rule is therefore not applicable. A Record of Non-Applicability is included in Appendix D. |
| Federal Water Pollution Control Act (Clean Water Act [CWA]) (33 U.S.C. §§ 1344 *et seq.*) | USEPA | CWA Section 401 water quality certification and CWA Section 404 permit will be prepared for Elevated Causeway System, Causeway Pier activities; and other activities involving fill below the high tide line within the SSTC. An amendment request to the existing Naval Base Coronado (NBC) National Pollutant Discharge Elimination System permit to include Reverse Osmosis Water Purification Unit discharge into the bay and ocean has been submitted. |

**Table 6-1: Summary of Environmental Compliance for the Proposed Action (Continued)**

| Plans, Policies, and Controls | Responsible Agency | Status of Compliance |
|---|---|---|
| Rivers and Harbors Act (RHA)<br>(33 U.S.C. §§ 401 et seq.) | United States Army Corps of Engineers (USACE) | A RHA Section 10 permit is required for Elevated Causeway and Causeway Pier construction and training. The permit application will be submitted to the USACE. |
| Coastal Zone Management Act (CZMA) (16 C.F.R. §§ 1451 *et seq*.) | California Coastal Commission (CCC) | A Coastal Consistency Determination (CCD) was prepared in compliance with the CZMA, which states that Federal actions that have reasonably foreseeable effects on coastal uses or resources must be consistent to the maximum extent practicable with the enforceable policies of approved state coastal management programs. Applicable sections of the California Coastal Act of 1976 (14 California Code of Regulations § 13001 *et seq*.) were thoroughly analyzed against the Proposed Action.<br>• The Navy submitted the CCD to the CCC on May 26, 2010.<br>• Coastal Consistency Determination conditional concurrence received on August 17, 2010.<br>• The Navy submitted a conditional concurrence response letter to the California Coastal Commission on August 20, 2010.<br>• Final Consistency Determination Notification letter to California Coastal Commission dated November 23, 2010. The Navy determined that the conditions of concurrence proposed by the California Coastal Commission are not necessary for the proposed activities to be consistent to the maximum extent practicable with the applicable enforceable policies of the California Coastal Management Program (CCMP) as the Navy's proposed activities are consistent to the maximum extent practicable with the CCMP. |
| Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. §§ 1801-1802) | National Oceanic and Atmospheric Administration (NOAA) - National Marine Fisheries Service (NMFS) | Implementation of the Proposed Action would result in a direct effect on eelgrass. However, based upon the minimal short-term impacts associated with the Proposed Action and extensive mitigation through eelgrass planting, there will not be any adverse effects to Essential Fish Habitat (EFH). The Navy submitted an EFH assessment to NMFS that reviews the impacts of the Proposed Action on EFH that includes applicable mitigation measures. The Navy has completed consultation with NMFS.<br>• The Navy submitted an EFH assessment to NMFS on March 22, 2010.<br>• EFH updated to reflect discussions during the consultation process. A revised EFHA was submitted (September 27, 2010) to NMFS with inclusion of measures in the proposed action to include updated benthic habitat mapping, pre-event beach survey, eelgrass mitigation, and underwater detonation reporting.<br>• NMFS provided Essential Fish Habitat Conservation Recommendations to the Navy on October 13, 2010.<br>• Consultation with NMFS was completed on November 10, 2010 with the Navy's response letter to NMFS. |

**Table 6-1: Summary of Environmental Compliance for the Proposed Action (Continued)**

| Plans, Policies, and Controls | Responsible Agency | Status of Compliance |
|---|---|---|
| Endangered Species Act (ESA) (16 U.S.C. §§ 1531 et seq.) | U.S. Navy, U.S. Fish and Wildlife Service (USFWS) | The EIS analyzes potential effects to species listed under the ESA. In accordance with ESA requirements, the Navy has completed consultation under Section 7 of the ESA with USFWS and which indicates that the Proposed Action may affect, not likely to adversely affect, ESA-listed species. With regard to USFWS jurisdiction over species present in SSTC, the Navy has conducted its activities in accordance with any applicable Biological Opinions.<br>• The Navy initiated consultation with USFWS on September 22, 2008.<br>• Between November 18, 2008 and April 27, 2009, the Navy and USFWS met regularly to discuss the Proposed Action, effects to species and associated incidental take, and conservation measures to avoid, minimize, and monitor impacts.<br>• USFWS provided a draft Biological Opinion to the Navy for review and comment on August 28, 2009. The Navy provided preliminary comments on the draft biological opinion on September 28, 2009. The Navy and USFWS discussed the Navy's comments at meetings held on September 21 and September 29, 2008. USFWS addressed these comments and provided a revised draft biological opinion to the Navy on January 15, 2010. The Navy provided additional comments on the revised draft Biological Opinion to USFWS, via electronic mail, on March 3, 2010. The Navy and USFWS discussed the Navy's additional comments at meetings held on March 4 and May 26, 2010. The USFWS addressed the Navy's comments in the final Biological Opinion.<br>• USFWS Biological Opinion signed on July 7, 2010 (FWS-SDG-08B0503-09F0517). |
| Endangered Species Act (ESA) (16 U.S.C. §§ 1531 et seq.) | U.S. Navy and NMFS | The Navy has also conducted informal consultation with NMFS for the green sea turtle. In accordance with ESA requirements, the Navy has completed informal consultation under Section 7 of the ESA with NMFS. NMFS has concurred that that the Proposed Action may affect, but is not likely to adversely affect, ESA-listed species.<br>• The Navy initiated informal consultation with NMFS for potential impacts to green sea turtles on March 15, 2010.<br>• The Navy coordinated two exchanges of comments and responses with NMFS.<br>• NMFS informal consultation on green sea turtles completed with letter of concurrence on November 17, 2010. |

**Table 6-1: Summary of Environmental Compliance for the Proposed Action (Continued)**

| Plans, Policies, and Controls | Responsible Agency | Status of Compliance |
|---|---|---|
| Marine Mammal Protection Act (16 U.S.C. §§ 1431 *et seq*.) | NOAA-NMFS | The Navy has submitted an application for an Incidental Harassment Authorization (IHA) to NMFS per the requirements of MMPA for proposed training activities that have the potential to incidentally take marine mammals.<br>• Received comments from NMFS on the IHA request on September 9, 2010.<br>• The Navy submitted the Final IHA to NMFS on September 15, 2010.<br>• Notice of Receipt of the IHA request published in the Federal Register on (October 19, 2010).<br>• After consideration of public comments on the IHA application, NMFS may grant the authorization to take small numbers of marine mammals by harassment if it finds that the taking will have a negligible impact on the species or stock(s) on subsistence uses (where relevant). NMFS will identify appropriate mitigation, monitoring and reporting requirements. |
| The National Marine Sanctuaries Act (16 U.S.C. §§ 1431 et. seq.) | NOAA | Implementation of the Proposed Action will have no effect on sanctuary resources in the offshore environment of southern California. Review of agency actions under Section 304 is not required. |
| The Sikes Act of 1960 (16 U.S.C. §§ 670a-670o, as amended by the Sikes Act Improvement Act of 1997, Pub. L. No. 105-85) | Department of Defense | Implementation of the Proposed Action will be implemented in accordance with the management and conservation criteria developed in the Sikes Act Integrated Natural Resources Management Plans for NBC. |
| National Historic Preservation Act (16 U.S.C. §§ 470 *et seq*.) | U.S. Navy | The Proposed Action will be implemented in compliance with Section 106 through a programmatic agreement with the State Historic Preservation Office, and pursuant to the criteria developed by the Navy for cultural resources management practices. As a result of cultural resource management practices, implementation of the Proposed Action will not result in any adverse effects to cultural resources. |
| Executive Order (EO) 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations | U.S. Navy | Implementation of the Proposed Action would not result in any disproportionately high and adverse human health or environmental effects on minority or low-income populations. |
| EO 13045, Protection of Children from Environmental Health Risks and Safety Risks | U.S. Navy | Implementation of the Proposed Action would not result in disproportionate environmental health or safety risks to children. |

**Table 6-1: Summary of Environmental Compliance for the Proposed Action (Continued)**

| Plans, Policies, and Controls | Responsible Agency | Status of Compliance |
|---|---|---|
| EO 13112 Invasive Species | U.S. Navy | EO 13112 requires agencies to identify actions that may affect the status of invasive species and take measures to avoid introduction and spread of these species. To the extent invasive species management relates to ESA compliance on SSTC, the BO ensures compliance with EO 13112. This EIS also otherwise satisfies the requirement of EO 13112. |
| EO 11990 Protection of Wetlands | U.S. Navy | Section 2 (b) of EO 11990 requires federal agency action when there would be a significant impact to wetlands. Implementation of the Proposed Action would not have a significant impact on wetlands. |
| EO 12962 Recreational Fisheries | U.S. Navy | EO 12962 requires agencies to conserve, restore and enhance aquatic systems to provide for increased recreational fishing opportunities nationwide. Implementation of the Proposed Action will comply with these duties. |
| California Marine Life Protection Act (MLPA); Marine Managed Areas Improvement Act (California Department of Fish and Game [CDFG] Code §§ 2850-2863) | CDFG | MLPA requires CDFG to confer with the Navy regarding issues related to Navy activities. However, there are no proposed or existing Marine Managed Areas within the SSTC boundaries. |
| Migratory Bird Treaty Act (MBTA) (16 U.S.C. §§ 703-712) | USFWS | Implementation of military readiness activities will not have a significant adverse effect on any population of migratory birds, and will comply with the MBTA, and will not require a permit under the MBTA. |

Note: Relevant agency correspondence is provided in Appendix G.

## 6.2 RELATIONSHIP BETWEEN SHORT-TERM USES AND LONG-TERM PRODUCTIVITY

NEPA requires an analysis of the relationship between a project's short-term impacts on the environment and the effects that these impacts may have on the maintenance and enhancement of the long-term productivity of the affected environment. Impacts that narrow the range of beneficial uses of the environment are of particular concern. This means that choosing one option may reduce future flexibility in pursuing other options, or that committing a resource to a certain use may often eliminate the possibility for other uses of that resource.

The majority of activities addressed in this EIS would be categorized as long-term. For example, although the use of training areas for individual training activities (e.g., breacher) may be of short duration, the training areas would continue to receive increased and repeated use for the foreseeable future. As the proposed action includes an increase in training tempo, areas designated for training would accommodate a higher level of operational uses in the long-term which would, in turn, affect the long-term productivity of environmental resources in those areas. The Navy's proposal to increase access and availability of SSTC-N and SSTC-S oceanside beach training lanes and SSTC-S inland areas for military training is an example of the balancing of long-term productivity of the environment with the need to address range capability shortfalls. Addressing such shortfalls through planning and accommodation of future training tempo requirements and deployment schedules will allow the Navy to more readily facilitate long-term resource management strategies while achieving the near-term goal of providing the capacity and capabilities to fully support required training tasks and meet the Title 10 mandate.

## 6.3 IRREVERSIBLE OR IRRETRIEVABLE COMMITMENT OF RESOURCES

NEPA requires that environmental analysis include identification of "any irreversible and irretrievable commitments of resources which would be involved in the proposed action should it be implemented." Irreversible and irretrievable resource commitments are related to the use of non-renewable resources and the effects that the uses of these resources have on future generations. Irreversible effects primarily result from the use or destruction of a specific resource (e.g., energy or minerals) that cannot be replaced within a reasonable time frame. Irretrievable resource commitments involve the loss in value of an affected resource that cannot be restored as a result of the action (e.g., the disturbance of a cultural site).

Construction activities associated with increased training activities at the SSTC would result in the irretrievable commitment of nonrenewable energy resources, primarily in the form of fossil fuels (including fuel oil), natural gas, and gasoline construction equipment. Implementation of the Proposed Action would require fuels used by aircraft, vessels, and ground-based vehicles. Since fixed- and rotary-wing flight, amphibious vessels, and small craft activities could increase, total fuel use would increase. Fuel use by ground-based vehicles involved in training activities would also increase. Therefore, total fuel consumption would increase and this nonrenewable resource would be considered irreversibly lost.

## 6.4 ENERGY REQUIREMENTS AND CONSERVATION POTENTIAL

Increased training activities on SSTC would result in an increase in energy demand over the No Action Alternative. Although the required electricity demands would be met by the existing electrical infrastructure at SSTC, energy requirements would be subject to any established energy conservation practices. The use of energy sources would be minimized wherever possible without compromising safety, training, or testing operations.

## 6.5 NATURAL OR DEPLETABLE RESOURCE REQUIREMENTS AND CONSERVATION POTENTIAL

Resources that will be permanently and continually consumed by project implementation include water, electricity, natural gas, and fossil fuels. To the extent practicable, pollution prevention considerations are included. In addition, sustainable range management practices are in place that protect and conserve natural and cultural resources while preserving of access to training areas for current and future training requirement.

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# 7 LIST OF PREPARERS

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## CHAPTER 3.9 MARINE MAMMALS

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## CHAPTER 6 OTHER CONSIDERATIONS REQUIRED BY NEPA

There are no references for this Chapter.

## CHAPTER 7 LIST OF PREPARERS

There are no references for this Chapter.

# 9 Distribution List

# 9 DISTRIBUTION LIST

This chapter provides a list of public officials, agencies, tribal groups, organizations, and individuals who have either participated in the EIS scoping and comment process or have been identified by the Navy as being on the notification or distribution list for the DEIS.

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Central Library
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Unified School District
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Silver Strand Elementary School
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Bayside Elementary School
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Oceanside Public Library
Oceanside, CA

City of San Diego
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City of San Diego
Balboa Branch Library
San Diego, CA

City of San Diego
Central Library
Government Publications
Gary Klockenga
San Diego, CA

City of San Diego
East Branch Library
San Diego, CA

City of San Diego
Mission Hills Branch Library
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U.S. Department of Health and Human Services
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U.S. Department of Justice
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U.S. Department of the Interior
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U.S. Department of the Interior, Office of Environmental Policy & Compliance
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Oakland, CA

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U.S. Department of Transportation
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Maritime Administration
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U.S. Environmental Protection Agency
Kim DePaul
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U.S. Environmental Protection Agency Region IX
Office of Federal Activities
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U.S. Fish and Wildlife Service, California-Nevada Operations
Steve Thompson
Sacramento, CA

U.S. Fish and Wildlife Service, Sacramento Office
Sacramento, CA

U.S. Fish and Wildlife Service, San Diego NWRC
Chula Vista, CA

U.S. Fish & Wildlife Service
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U.S. Geological Survey
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Palo Alto, CA

U.S. Geological Survey, Marine Coastal Group
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Menlo Park, CA

U.S. Geological Survey, Western Regional Offices
Menlo Park, CA

U.S. House of Representatives
District 44
Ken Calvert
Riverside, CA

U.S. House of Representatives
District 46
Dana Rohrabacher
Huntington Beach, CA

U.S. House of Representatives
District 48
John Campbell
Newport Beach, CA

U.S. House of Representatives
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Darrell Issa
Vista, CA

U.S. House of Representatives
District 50
Brian Bilbray
Solana Beach, CA

U.S. House of Representatives
District 51
Robert Filner
Chula Vista, CA U.S. House of Representatives
District 52
Duncan Hunter
El Cajon, CA

U.S. House of Representatives
District 53
Susan Davis
San Diego, CA

U.S. Senate
Barbara Boxer
San Diego, CA

U.S. Senate
Dianne Feinstein
San Diego, CA

## ***Public List***

Adams, William

Airport Trust
Donald W. Rogers
La Jolla, CA

Airport Trust
Leon Campbell

American Association of Port Authorities
Susan Monteverde
Alexandria, VA

American Bird Conservancy
Michael J. Parr
Washington, D.C.

American Cetacean Society
Patty Geary
San Pedro, CA

American Fisheries Society
Ghassan Rassam
Bethesda, MD

American Legion, San Diego Chapter
San Diego, CA

American Oceans Campaign
Herbert Beldofe
Washington, D.C.

American Veterans
New York, NY

Angioletti, Barbara

Armella, Virginia Aspe and Eduardo Cortina

Audubon Society, San Diego Chapter
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San Diego, CA

Audubon Society, San Diego Chapter
Chris Redfern
San Diego, CA

Audubon Society, San Diego Chapter
Jim Peugh
San Diego, CA

Barona Band of Mission Indians
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Bailey, Andrew

Barck, Richard
Coronado, CA

Baumer, Edward
Coronado, CA

Baxter, Michael B.
Imperial Beach, CA

Besikof, Jim

Blair, Jennifer
Coronado, CA

Brown, Fred

Helen Bourne
Carlsbad, CA

Brunson, Pat

Butler, Elizabeth H.

Butler, Harry

Buxton, Cynthia

California Abalone Association
John Colgate
Santa Barbara, CA

California Cooperative Fishery Research Unit
Walter Duffy
Arcata, CA

California Indian Legal Services
Charmaine Huntting-Coronel
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California Lobster & Trap Fishermen's Association
John Guth
Vista, CA

California Native Plant Society, San Diego Chapter
Carolyn Martus
c/o San Diego Natural History Museum,
San Diego, CA

California Yacht Marina, Chula Vista
Chula Vista, CA

Callahan, Earle
Coronado, CA

Calmes, Benton

Camaisa, Ted

Cameron, Joan

Carney Schulze, Jane
Visuals Plus
San Diego, CA

Cassedy, Jayne

Catfish Club
San Diego, CA

Cavanaugh, Jim

Center for Biological Diversity
San Diego, CA

Campo Band of Kumeyaay Indians
Ralph Goff, Chairman
Campo, CA

Center for Biological Diversity
Los Angeles, CA

Center for Marine Conservation
Kristina Roy
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Chapman, Jennifer
Imperial Beach, CA

Charter Connections
Pamela Terrebone
Coronado, CA

CHIPS Magazine
NCTAMS LANT
Norfolk, VA

Chubasco Sportfishing
Ernie Cazis
Reseda, CA

Chula Vista Chamber of Commerce
Chula Vista, CA

Chula Vista Marina
Chula Vista, CA

Chula Vista Yacht Club
Chula Vista, CA

Clean Bay Campaign
San Diego, CA

Clifford, Jim

Coastal Maritime Archaeological Resources
Los Angeles Maritime Museum
San Pedro, CA

Cohan, Steve

Cohen, Lois
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Collinsworth, Van
San Diego, CA

Conrad, Mark
Coronado, CA

Copper, Elizabeth
Coronado, CA

Coronado Cays Homeowners Association
Coronado, CA

Coronado Cays Yacht Club
Jim Shirey
Coronado, CA

Coronado Chamber of Commerce
Coronado, CA

Coronado Eagle and Journal
Dean Eckenroth
Coronado, CA

Coronado Navy League
Mr. Mike Conner
Coronado, CA

Coronado Shores Condominium Association Number 1
Coronado, CA

Coronado Shores Condominium Association Number 2
Coronado, CA

Coronado Shores Condominium Association Number 3
Coronado, CA

Coronado Shores Condominium Association Number 4
Coronado, CA

Coronado Shores Condominium Association Number 5
Coronado, CA

Coronado Shores Condominium Association Number 6
Coronado, CA

Coronado Shores Condominium Association Number 7
Coronado, CA

Coronado Shores Condominium Association Number 8
Coronado, CA

Coronado Shores Condominium Association Number 9
Coronado, CA

Coronado Shores Condominium Association Number 10
Coronado, CA

Coronado Yacht Club
Lou Milioti
Coronado, CA

Cousteau Society
Clark Merriam
Hampton, VA

Cuyapaipe Band of Mission Indians
Tony J. Pinto, Chairman
Alpine, CA

Davis, Shannon and William
Imperial Beach, CA

Dean, Joan
San Diego, CA

Defenders of Wildlife
Sacramento, CA

Defenders of Wildlife
Washington, D.C.

Defense News
Sharon Denny
Springfield, CA

Degenhart, Ed
Imperial Beach, CA

Dick, William
Coronado, CA

Dimmock, Bill
Imperial Beach, CA

Dimmock, Cheryl
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Dogs at Play
Imperial Beach, CA

Dorr, William

Dribben, Douglas

Dyer, Beverly
Coronado, CA

E&E Publishing, LLC
Greenwire
Washington, D.C.

Earthjustice
Elizabeth Carpino
Oakland, CA

Ecology Center of Southern California
Anna Harlowe
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Endangered Species Recovery Council
William Everett
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Engineering Management Concepts
Anthony Parisi
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Environment Now
Terry O'Day
Santa Monica, CA

Environmental Defense Fund
New York, NY

Environmental Health Coalition
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Federal/Navy Times
Springfield, VA
Marilyn Field
Coronado, CA

Feltis, Edward
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Field, Marilyn G.
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Field, William S.
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Fischer, Gregory
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Flynn, Vincent J.
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Foster, Jeffrey G.
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FOX - 6
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Friends of Sea Lions
Bill Ford
Laguna Beach, CA

Fury Sportfishing Inc.
Rick Doesburg
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Geissler, Gerd
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Geissler, Lilo
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Glorietta Bay Marina
Coronado, CA

Grady, Dani. S.
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Greater San Diego Business Association
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Greenaction for Health and Environmental Justice
Bradley Angel
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Greenpeace
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Greenspan, Ralph
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Gregory, Steven

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Harmon, Wayne
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Head, R.G.
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Helgren Sportsfishing
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Horizon Charter
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Hotel Del Coronado
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Hrodey, Robert

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Hubbs-Sea World Research Institute
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Humane Society
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Humphrey, Carol
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Imperial Beach Chamber of Commerce & Visitors Bureau
Imperial Beach, CA

Imperial Beach Times
Imperial Beach, CA

Inaja & Cosmit Band of Mission Indians
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Institute for Wildlife Studies
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International Boundary and Waters Commission
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Iosupovici, Miriam

Island Gabrieleno Group
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Kelp Cutters
Dale Glantz
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Kennedy, Ann S.
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KFMB - Ch 8
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KGTV - Ch 10
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Kiwanis Club, San Diego Chapter
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KNSD 7/39
San Diego, CA

KOGO (600 AM)
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KPBS TV
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KSWB 69
San Diego, CA

Kuebler, N.J.
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Kumeyaay Cultural Repatriation Committee
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KUSI 51
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La Posta Band of Mission Indians
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Loews Coronado Bay Resort
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Loews Coronado Marina
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Marlin Club
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McCoy, Patricia W.
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McGinty, Michael
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McGuinness, Neil

Coronado Yacht Club
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McKay, Deb
McKirnan, Dan

McPherson, Tracy

Mesa Grande Band of Mission Indians
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Military Press
San Diego, CA

Miller, Robert

Mires, Ronald and Nancy

Mitchell, Ken
San Diego, CA

Moritz, Roland
Coronado, CA

National Audubon Society
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National City Chamber of Commerce
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National Coalition for Marine Conservation
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Natural Resources Defense Council
New York, NY

Natural Resources Defense Council
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Nature Conservancy, San Diego Chapter
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Naval Aviation News Magazine
Blake Towler
Washington, D.C.

Navy Compass
San Diego, CA

Navy Dispatch
San Diego, CA

Navy League, Coronado Chapter
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Navy League, Coronado Council
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Navy Marine Corps Times
San Diego Bureau
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Navy Yacht Club San Diego
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Coronado, CA

Nicieza, Omar

North County Times
Joe Beck
Escondido, CA

North County Times
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Ocean Beach Branch Library
San Diego, CA

Ocean Futures Society
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Oceanside Anglers Club
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Office of Military Base Retention and Reuse
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Dana Point, CA

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Pacific Anglers
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Pacific Beach Branch Library
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Pacific Coast Federation of Fishermen's Associations
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Planning and Conservation League
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Price, Ambassador John
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Recreational Boaters of California
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Retired Officers Association
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Rotary Club
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Rural Alliance for Military Accountability (RAMA)
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Salt Water Fly Rodders
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San Diego Bay Council

San Diego County Archaeological Society
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San Diego Business Journal
San Diego, CA

San Diego Central Library
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San Diego Daily Transcript
San Diego, CA

San Diego Flyfishers
San Diego, CA

San Diego Harbor Police
San Diego, CA

San Diego Herpetological Society
San Diego, CA

San Diego Log
Welch
San Diego, CA

San Diego Magazine
San Diego, CA

San Diego Marlin Club
San Diego, CA

San Diego Natural History Museum
San Diego, CA

San Diego Oceans Foundation
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San Diego Port Tenants Association
Kristin Tyson
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San Diego Reader
San Diego, CA

San Diego Regional Chamber of Commerce
San Diego, CA

San Diego Rod and Reel Club
San Diego, CA

San Diego Shark Diving Expeditions
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Robert Fisher
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San Diego State University
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San Diego Union Tribune
Cheryl Walker
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San Diego Voice and Viewpoint
San Diego, CA

San Diego Yacht Club
Commodore
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San Diego Yacht Club Anglers
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Santa Ysabel Band of Mission Indians
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Santana Magazine/Dockside Media Corporation
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Scripps Institute of Oceanography
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Sea Magazine
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Searfus, Timothy

Sea Urchin Harvester's Association of California
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Sea World
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Smith, Kent

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Society for Ecological Restoration International
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Southern California Yachting Association
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Southwest Anglers Incorp
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Sportfishing Association of California
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Steamship Association of Southern California
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Stowe, Yvonne

Stump, Anna

Surface Warfare Magazine
Steven C. Sparling
Alexandria, VA

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Trieschman, Gary
Imperial Beach, CA

Trovato-Wilson, Normandie

Trump. Gary
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Bay Flotilla
Joan Swartz
c/o Coronado Yacht Club
Coronado, CA

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Young Research Library
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Vernal Pools Society
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Warner, John

Weddle, Susan and Monte
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Wells, Dewey

Wildland Resources Center
University of California Berkeley,
CA

Wildlife Society, Western
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Forestry Services Lab
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Wilson, Richard

Wings of Gold
Naval Aviation Foundation
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Wright, Karen
Imperial Beach, CA

XETV - Ch 6
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Yamagata, Susan
Imperial Beach

Yim, Douglas
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YMCA - Camp Surf
Mark Thompson
Imperial Beach, CA

Zoological Society of San Diego
Jeff Opdycke
San Diego, CA

# Silver Strand Training Complex

# Environmental Impact Statement

Commander
United States Navy Pacific Fleet

***Lead Agency:***
Department of the Navy

***Action Proponent:***
United States Pacific Fleet

***Cooperating Agency:***
Department of Commerce
National Oceanographic and Atmospheric Administration
National Marine Fisheries Service

## Appendices A - G

## January 2011

**Point of Contact:** Amy P. Kelley
Naval Facilities Engineering Command Southwest
Code EV21.AK
1220 Pacific Highway
San Diego, CA 92132
619-532-2799

# Appendix A
# Federal Register Notice of Intent

# Appendix A: Notice of Intent

Federal Register / Vol. 66, No. 151 / Monday, August 6, 2001 / Notices 41009

1. The SSA will use 60–0103, entitled 'Supplemental Security Income Record and Special Veterans Benefits', last published on February 21, 2001 at 66 FR 11080.

2. The DMDC will use S322.10 DMDC, entitled 'Defense Manpower Data Center Data Base', last published on May 31, 2001 at 66 FR 29552.

E. DESCRIPTION OF COMPUTER MATCHING PROGRAM:

SSA, as the source agency, will provide DMDC with an electronic file which contains the data elements. Upon receipt of the electronic file, DMDC, as the recipient agency, will perform a computer match using all nine digits of the SSN of the SSI/SVB file against a DMDC database which contains the data elements. The DMDC database consists of extracts of personnel and pay records of retired members of the uniformed services or their survivors. The ''hits'' or matches will be furnished to SSA. SSA is responsible for verifying and determining that the data on the DMDC electronic reply file are consistent with the SSA source file and resolving any discrepancies or inconsistencies on an individual basis. SSA will also be responsible for making final determinations as to eligibility for /entitlement to, or amount of payments/ benefits, their continuation or needed adjustments, or any recovery of overpayments as a result of the match. The DMDC database consists of extracts of personnel and pay records of retired members of the uniformed services or their survivors.

1. The electronic SSA query file contains approximately 6.5 million records extracted from the Supplemental Security Income Record.

2. The electronic DMDC database contains records on approximately 2.15 million retired uniformed service members or their survivors.

F. INCLUSIVE DATES OF THE MATCHING PROGRAM:

This computer matching program is subject to public comment and review by Congress and the Office of Management and Budget. If the mandatory 30 day period for comment has expired and no comments are received and if no objections are raised by either Congress. The Office of Management and Budget within 40 days of being notified of the proposed match, the computer matching program becomes effective and the respective agencies may begin the exchange at a mutually agreeable time on a quarterly basis, shifting to a monthly basis when and if the computer system work can be completed to effectuate the increased frequency. By agreement between SSA and DMDC, the matching program will be in effect for 18 months with an option to renew for 12 additional months unless one of the parties to the agreement advises the other by written request to terminate or modify the agreement.

G. ADDRESS FOR RECEIPT OF PUBLIC COMMENTS OR INQUIRIES:

Director, Defense Privacy Office, 1941 Jefferson Davis Highway, Suite 920, Arlington, VA 22202–4502. Telephone (703) 607–2943.

[FR Doc. 01–19591 Filed 8–3–01; 8:45 am]

BILLING CODE 5001–08–M

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## DEPARTMENT OF DEFENSE

### Department of the Navy

### Notice of Intent To Prepare an Environmental Impact Statement (EIS) for Optimizing Current and Future Operations, Training and Maintenance at the Beaches of Naval Amphibious Base (NAB) Coronado and Naval Radio Receiving Facility (NRRF) Imperial Beach and To Announce Public Scoping Meetings

**AGENCY:** Department of the Navy, DOD.

**ACTION:** Notice.

**SUMMARY:** The Department of the Navy (Navy) announces its intent to prepare an Environmental Impact Statement (EIS) to evaluate the environmental effects of current and future operations, training and maintenance at the beaches of Naval Amphibious Base Coronado, ''NAB'', Naval Radio Receiving Facility Imperial Beach, ''NRRF'', and within the fenced compound at NRRF.

**DATES AND ADDRESSES:** Public scoping open houses will be held to receive oral and/or written comments on environmental concerns that should be addressed in the EIS. Public scoping open houses will be held from 7:00 to 8:30 p.m. the following dates and locations: Tuesday, August 28, 2001 at the Coronado Public Library (Winn Room), 640 Orange Avenue, Coronado, CA; Wednesday, August 29, 2001 at Bayside Elementary School, 490 Emory Street, Imperial Beach, CA.

**FOR FURTHER INFORMATION CONTACT:** Ms. Jenny Boyd, South Bay Area Focus Team, Southwest Division, Naval Facilities Engineering Command, 2585 Callagan Highway, Building 99, San Diego, CA 92136–5198, telephone (619) 556–8589.

**SUPPLEMENTARY INFORMATION:** Pursuant to section 102(2)(c) of the National Environmental Policy Act (NEPA) of 1969, as implemented by the Council on Environmental Quality Regulations (40 CFR Parts 1500–1508), the Department of the Navy (Navy) announces its intent to prepare an Environmental Impact Statement (EIS) to evaluate the environmental effects of current and future operations, training and maintenance at the beaches of Naval Amphibious Base Coronado, ''NAB'', Naval Radio Receiving Facility Imperial Beach, ''NRRF'', and within the fenced compound at NRRF.

NAB Coronado is the only Navy amphibious base on the West Coast. It includes 5,500 yards of Pacific Ocean and bayside beachfront that is used for training. This area, along with 2,000 yards of Pacific Ocean beachfront at NRRF, provide operators with 7,500 yards of expansive beaches, unique topography, and on-base facilities that encompass a critical area for amphibious and clandestine training in support of littoral, unconventional, and special warfare operations.

The proposed action is to allocate operations and training between NAB and NRRF in a manner that optimizes use of those facilities while protecting threatened and endangered species. Operationally realistic training at NAB and NRRF is critical to military mission readiness requirements. However, due to the Navy's on-going, successful resource management program, threatened and endangered biological resources are thriving on the beaches at NAB Coronado. This poses a problem for scheduling required training because the increase in least tern and snowy plover populations is decreasing the size of beachfront available for crucial training and the time during which it is available.

NAB has reviewed its current and future operations, training and maintenance requirements as well as the training needs of tenant commands and other commands in Southern California that use the training facilities at NAB. The EIS will address three alternatives (including the No Action Alternative) for optimizing training at NAB and NRRF based on that internal review.

The No Action Alternative would continue current levels of operations at NAB and NRRF and utilize natural resource management strategies identified in NAB's natural resource management plan. While most operations and training currently are conducted at NAB, a limited number of amphibious training operations are conducted at NRRF. Specific operations are delineated for each location. Current operations delineated for NAB include Warfare Training (amphibious assaults and combat training, clandestine shore assaults, mine countermeasures,

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navigation/surf handling training, SCUBA training, ship surveillance) and Strategic Sealift Training (Elevated Causeway System Training) on the Pacific Ocean beachfront. Current bayside operations also include Warfare Training (amphibious assaults and clandestine shore assaults) and Strategic Sealift Training (ELCAS, amphibious assault bulk fuel/water systems). NAB also supports several training area users that have unique training requirements. One of the larger users is the Marine Corp's Expeditionary Warfare Training Group, Pacific. Their primary mission is to conduct warfare training courses for expeditionary and amphibious operations with emphasis on landing force operations using amphibious platforms. Current operations delineated for NRRF include inflatable landing craft, practice assault beaching and underwater navigation techniques. Current resource management strategies will continue with the habitat maintenance practice of predator control, decoy placement, beach maintenance, and coning off Western snowy plover nests on the beaches at NAB. It will also continue using the formal scheduling process for training operations.

Alternative One proposes a more integrated use of NAB and NRRF for current operations as well as the addition of new types of operations at NAB and NRRF. Under Alternative One, all 7,500 yards of beach area at NAB and NRRF would be available to support current operations. This alternative recognizes the dynamic that exists between operational uses and protection of natural resources. As the most significant natural resource issues at NAB involve nesting and foraging, location and timing of operations are critical considerations. Training operations often conflict with nesting season of growing least tern and snowy plover populations. Alternative One would provide operators with the option of training at NAB or NRRF during nesting season and would address the complete range of impacts of training at both NAB and NRRF.

Rather than a rigid matrix that pairs specific operations with a specific location, Alternative One proposes that decisions on the location of operations be based upon the ability of the location to handle a given type and level of operations at a given time of year. This would allow greater flexibility for year round use of NAB and NRRF. The following operations are included under Alternative One: Warfare Training, Strategic Sealift Training, and landing force operations currently conducted at NAB; inflatable landing craft, practice assault beaching, and underwater navigation techniques currently conducted at NRRF; and new operations consisting of mine disabling training in San Diego Bay along the NAB shoreline; new operations consisting of ordnance disposal training and land reconnaissance exercises on the beach and within the fenced compound at NRRF.

In addition to the current habitat maintenance practice of predator control, decoy placement, beach maintenance, coning off Western snowy plover nests and using a formal scheduling procedure, Alternative One proposes to incorporate coning off California least tern nests and clearly delineating beach-crossing lanes.

Alternative Two proposes to relocate the majority of current Warfare Training, Strategic Sealift Training, and landing force operations from NAB to NRRF during nesting season. Current operations involving inflatable landing craft, practice assault beaching, and underwater navigation techniques would continue at NRRF. Alternative Two also includes: the addition of mine disabling training in San Diego Bay along the NAB shoreline, new ordnance disposal training, and land reconnaissance exercises on the beach and within the fenced compound at NRRF. Alternative Two also proposes the additional habitat maintenance practices of coning off California least tern nests and clearly delineating beach-crossing lanes, as proposed in Alternative One at NAB.

In addition to analyzing impacts on the full range of natural, biological, and cultural resources, the EIS will examine aesthetic and socioeconomic issues, management practices for California least tern and Western snowy plover nesting habitat avoidance, and management practices for the salt marsh bird's beak.

To facilitate preparation of its EIS, the Navy has initiated this scoping process. The purpose of the scoping process is to identify community concerns and local issues that should be addressed. Federal, state, and local agencies, elected officials, non-governmental organizations, and interested persons are encouraged to attend scheduled scoping meetings and provide comments on the scope of issues to be addressed in the EIS. Scoping comments that clearly describe specific issues or topics are particularly helpful.

All comments not received at the scheduled public meetings must be in writing and must be postmarked by September 14, 2001. Comments should be mailed or faxed to: Southwest Division, Naval Facilities Engineering Command, Attn: Ms. Jenny Boyd, South Bay Area Focus Team, 2585 Callagan Highway, Building 99, San Diego, CA 92136–5198, fax (619) 556–8929.

Dated: July 30, 2001.

**T.J. Welsh,**

*Lieutenant Commander, Judge Advocate General's Corps, U.S. Navy, Federal Register Liaison Officer.*

[FR Doc. 01–19613 Filed 8–3–01; 8:45 am]

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## DEPARTMENT OF ENERGY

### Idaho Operations Office; Emerging Technology Deployment

**AGENCY:** Idaho Operations Office, DOE.

**ACTION:** Notice of availability of financial assistance solicitation No. DE–PS07–01ID14181.

**SUMMARY:** The U.S. Department of Energy (DOE) Idaho Operations Office (ID) is soliciting the submission of proposals for field testing of technologies to reduce energy consumption, enhance economic competitiveness, and reduce environmental impacts, specifically in the Industries of the Future (IOF) industrial sectors. The objective of the solicitation is to find ways to mitigate the risk to industries of accepting and using emerging technologies developed by the IOF program. It is not the intent of DOE–ID to solicit research and development projects. At least a 50% cost share will be required.

This solicitation is commissioned on behalf of the DOE's Office of Industrial Technology (OIT) BestPractices Program, which has been established to provide integrated delivery of energy-saving products, services, and technologies to the nine IOF sectors. Additional information about the BestPractices Program can be found on the website (*http://www.oit.doe.gov/bestpractices*). The IOF industry-specific vision documents and technology roadmaps are available at *http://www.oit.doe.gov/* under individual IOF program areas.

**DATES:** The deadline for receipt of applications is October 19, 2001. Awards are expected to be made on or about January 15, 2002.

**ADDRESSES:** The solicitation in its full text is available on the Internet at the following URL address: *http://e-center.doe.gov.* All applications must be submitted through the DOE e-center site.

**FOR FURTHER INFORMATION CONTACT:** T. Wade Hillebrant, Contract Specialist, hillebtw@id.doe gov.

# Appendix B
# Description of Vessels

# Appendix B

## Descriptions of Vessels, Vehicles, and Aircraft used at SSTC

| TYPE OF EQUIPMENT | DESCRIPTION |
|---|---|
| **MARITIME VESSELS** | |
| Small Insertion/Extraction Vessels | Consists of different types of crafts such as the Combat Rubber Raiding Craft (CRRC), Inflatable Boats (IBS), and Sea Kayak. The CRRC is a 15-foot rubber raft and may be equipped with a small engine. IBS and Kayak boats are propelled by paddling. CRRCs and IBS hold up to 9 crew members. |
| Support/Transport Vessels | The Mark V Special Operations Craft (Mark V SOC) is an 82-foot vessel used to carry Special Operations Forces (SOF), primarily SEAL combat swimmers, into and out of operations.<br>The Landing Craft, Mechanized and Utility (LCM/LCU) and Maritime Prepositioned Force Utility Boat (MPFUB) are capable of transporting cargo, tracked and/or wheeled vehicles and troops from amphibious assault ships to beachheads or piers. LCUs are 135-foot propeller driven craft that are typically used to land/retrieve personnel and equipment (tanks, artillery, equipment, motor vehicles) during amphibious operations. LCMs have a bow ramp for unload/offload. Holds 14 crew members.<br>Landing Craft, Air Cushioned (LCAC) is an 87-foot high-speed, over-the-beach fully amphibious landing craft, capable of carrying a 60- to 75-ton payload and capable of speeds of more than 40 knots over water. Capable of operating from existing and planned well deck ships, it is used to transport weapons systems, equipment, cargo and personnel from ship to shore and across the beach. The LCAC, like all "hovercraft," rides on a cushion of air. The air is supplied to the cushion by four centrifugal fans driven by the craft's gas turbine engines. The air is enclosed by a flexible skirt system manufactured of rubberized canvas. Holds 5 crew members. |
| Propeller Driven Crafts | Rigid Hull Inflatable Boats (RHIBs) are 35-foot high-speed, high-buoyancy, extreme-weather craft with the primary mission of SEAL insertion/extraction, which have a rigid hull and inflatable tube gunwale made of reinforced fabric. The rugged, seaworthy, versatile 36-foot RHIB has a 200-nm range at 32 knots, with a 45-knot top speed. It can carry 8 passengers or 3,200-pound payload and 3 crew members. |
| Water-Jet Driven Craft/Personal Watercraft | The Jet-boat craft that will replace outboard engine RHIB vessels in the future. Small jet-driven vessel (i.e., wave runner) is primarily used for safety support and in the surf zone. |
| Ship to Shore Logistics Equipment | Causeway Section Powered/Warping Tug and Barge Ferrys make up the main building blocks for the modular causeway section and ELCAS activities. The causeway sections are 24 foot x 80 foot platforms configured from compatible floating pontoons. Causeway sections are assembled to configure three sub-systems: Floating Causeway, Roll On/Roll Off Discharge Facility (RRDF), and Causeway Ferry. The OUB (Offshore Petroleum Discharge System [OPDES] Utility Boat) to support ship to shore transfer of fluids. |
| Unmanned Underwater Vehicles (UUV) | Self-propelled submersible used in reconnaissance activities for either fully autonomous (programmed) or under minimal supervisory control. Vehicles range from 63-70 inches in length and have a 7.5-inch diameter. |

| TYPE OF EQUIPMENT | DESCRIPTION |
|---|---|
| **VEHICLES** | |
| Construction/ Excavation Equipment | Bulldozers, forklifts, payloaders, and cranes, used for grading, digging, and transport of equipment. |
| Amphibious Vehicles | Lighter, Amphibious, Resupply, Cargo-5 ton (LARC V) is a 63-ft aluminum hulled amphibious cargo vehicle capable of transporting 5 tons.<br><br>The tracked Amphibious Assault Vehicle (AAV) is a 26-ton (23,991-kilograms [kg]) fully combat-loaded vehicle with a 3-man crew. With a road speed of 45 miles per hour (mph), it is also fully amphibious with water speeds up to 8 mph. |
| Light-Wheeled Vehicles | Consists of light tactical vehicles for command and control, special purpose shelter carriers, and special purpose weapons platforms. Types used include the High Mobility Multipurpose Wheeled Vehicle (HMMWV) or 4-wheeled drive pick-up trucks. |
| **AIRCRAFT** | |
| Helicopters | Helicopters typically used are CH-60, SH-60, MH-60S (proposed), CH-53E, and CH-46E. AH-1W attack and UH-1N may also be used. |
| Unmanned Aircraft System (UAS) | Small, light, unmanned electric driven crafts that are remotely flown. UASs less than 20 lbs and with a 5 foot wingspan are typically used. |

# Appendix C
# Emissions Calculations

| Scenario | Type Training | Reference Days (a) | Operations (b) | No. of Personnel | Ship/Boat Type | Number of vessels possible | Number of vessels assumed | Vessels per year | Ground Vehicles | Number of vehicles possible | Number of vehicles assumed | Vehicles per year | Aircraft | Number of aircraft possible | Number of aircraft assumed | Aircraft per year | Ordnance | Number of ordnance possible | Number of ordnance assumed |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **1.1.2** | **Conduct Maneuver - Move Forces** | | | | | | | | | | | | | | | | | | |
| 1 | Anchoring | 1 | 72 | | RHIB | 1 | 1 | 72 | None | 0 | 0 | 0 | None | 0 | 0 | 0 | None | 0 | 0 |
| | | | | | Ship (DDG or CG) | 1 | 1 | 72 | | | | | | | | | | | |
| 2 | Towing | 1 | 30 | | Foss Tug | 1 | 1 | 30 | None | 0 | 0 | 0 | None | 0 | 0 | 0 | None | 0 | 0 |
| | | | | | Ship (DDG or CG) | 1 | 1 | 30 | | | | | | | | | | | |
| 3 | Moor to Buoy | 1 | 36 | | RHIB | 1 | 1 | 36 | None | 0 | 0 | 0 | None | 0 | 0 | 0 | None | 0 | 0 |
| | | | | | Ship (DDG or CG) | 1 | 1 | 36 | | | | | | | | | | | |
| **1.3.1** | **Perform Mine Countermeasures** | | | | | | | | | | | | | | | | | | |
| 4 | Parachute Operations | 1 | 216 | 10 to 20 | RHIBs | 2-4 | 3 | 648 | 4WD Pickups | | 2 | 432 | SH60 | 1 | 1 | 216 | Smoke Grenades/Flares | | 3 |
| 5 | MCM Operations | 1 | 32 | 9 | Zodiacs | | 1 | 32 | 4WD Pickups | | 2 | 64 | None | 0 | 0 | 0 | Blast Caps/ Diver Recalls | | |
| | | | | | | | | | | | | | | | | | 10 - 20 lb Underwater Explosives | 1 | 1 |
| 6 | Floating Mine Operations | 1 | 25 | | RHIBs | 2 | 2 | 50 | 4WD Pickups | 1 | 1 | 25 | SH-60 - 2 Hour | 1 | 1 | 25 | Blast Caps/ Diver Recalls | | 2 per training |
| | | | | | | | | | | | | | | | | | Less than or equal to 5 lb | 1 | 1 |
| 7 | Dive Platoon | 1 | 8 | | RHIB | 2 | 2 | 16 | None | 0 | 0 | 0 | SH-60 - 2 Hour | 1 | 1 | 8 | Blast Caps/Explosives | | 9 per training |
| | | | | | | | | | | | | | | | | | 3.5 lb | 8 | 8 sequential command detonated |
| 8 | Very Shallow Water (VSW) Operator Course | 8 | 4 | 10 | RHIBs / Water-Jet Driven Craft | 2 | 2 | 8 | None | 0 | 0 | 0 | None | 0 | 0 | 0 | Diver Recalls | 2 | 2 per training |
| 9 | VSW Mine Countermeasure Operations | 1 | 120 | 10 to 20 | RHIBs / Water-Jet Driven Craft | 2 to 3 | 3 | 360 | None | 0 | 0 | 0 | None | 0 | 0 | 0 | Diver Recalls | 2 | 2 per training |
| 10 | Autonomous Underwater Vehicle (AUV) Operations/UUV Operations | 1 | 120 | 5 to 10 | RHIBs / Water-Jet Driven Craft | 2-3 | 2 | 240 | None | 0 | 0 | 0 | None | 0 | 0 | 0 | Blast Caps/ Diver Recalls | 2 | 2 per training |
| | | | | | Submersible | 2 | 2 | 240 | | | | | | | | | | | |
| 11 | MK8 Marine Mammal/MMS Operations | 1 | 175 | 11 to 13 | RHIBs / Water-Jet Driven Craft | 2 to 4 | 4 | 700 | 4WD Pickups | | 0 | 0 | None | 0 | 0 | 0 | 13lbs [MK 87/88 C-4 in GRP | | Approximately 10% of training involves the setting of a 13- or 29-pound |
| | | | | | | | | | | | | | | | | | 29lb [MK86/89 PBXN in AL canister] | | Approximately 10% of training involves the setting of a 13- or 29-pound |
| 12 | Mine Neutralization | 1 | 4 | 16 | RHIBs / Water-Jet Driven Craft | | 2 | 8 | 4WD Pickups | 2 | 2 | 8 | SH-60 - 2 Hour | 1 | 1 | 4 | Blast Caps/ Diver Recalls | | 9 per training |
| | | | | | | | | | | | | | | | | | 3.5lb explosive | 8 | 8 sequential command detonated |
| **1.4.6** | **Conduct Maritime Interception** | | | | | | | | | | | | | | | | | | |
| 13 | Visit, Board, Search and Seizure | 1 | 30 | | Foss Tug | 1 | 1 | 30 | None | 0 | 0 | 0 | None | 0 | 0 | 0 | None | 0 | 0 |
| | | | | | RHIB | 1 | 1 | 30 | | | | | | | | | | | |
| | | | | | Ship (DDG or CG) | 1 | 1 | 30 | | | | | | | | | | | |
| **1.5.4** | **Conduct Amphibious Operations** | | | | | | | | | | | | | | | | | | |
| 14 | Small Boat Handling | 1 | 94 | 28 | CRRC | 4 | 4 | 376 | HMMWV | 1 | 1 | 94 | None | 0 | 0 | 0 | None | 0 | 0 |
| 15 | Swimmer Conditioning - Bay and Ocean with fins | 1 | 189 | 16 | Personal Watercraft / CRRC / RHIB | 1 | 1 | 189 | HMMWV | 1 | 1 | 189 | None | 0 | 0 | 0 | None | 0 | 0 |
| | | | | | | | | | Truck | 1 | 1 | 189 | | | | | | | |
| 16 | Basic Reconnaissance Course Final Mission | 1 | 8 | 40 (in groups of 6 to 8) | IBS | 1 | 1 | 8 | None | 0 | 0 | 0 | SH60 | 1 | 1 | 8 | None | 0 | 0 |
| | | | | | LCU | 1 | 1 | 8 | | | | | | | | | | | |
| 17 | Obstacle Course | 1 | 138 | 8 to 150 | None | 0 | 0 | 0 | 4WD Pickups | 1-3 | 2 | 276 | None | 0 | 0 | 0 | None | 0 | 0 |
| 18 | Hydrographic Reconnaissance | 1 | 40 | 8 to 60 | Personal Watercraft | 1 | 1 | 40 | 4WD Pickups | 1-4 | 3 | 120 | None | 0 | 0 | 0 | None | 0 | 0 |
| | | | | | Small Water Craft | 1 to 8 | 8 | 40 | | | | | | | | | | | |
| | | | | | RHIB / CRRC | 1 | 1 | 40 | | | | | | | | | | | |
| | | | | | rigid, 10-meter craft | 1 | 1 | 40 | | | | | | | | | | | |
| 19 | Surf Observations (SUROBS) | 1 | 116 | 16 to 48 | None | 0 | 0 | 0 | 4WD Pickups | 2 | 2 | 232 | None | 0 | 0 | 0 | None | 0 | 0 |
| 20 | CRRC Inflatable Boat Small (IBS)/Surf Passage/Boat Team Organization and Function | 1 | 72 | 28 to 60 | CRRC/Zodiac/Propeller Surface Craft/RHIB | 4 to 10 | 6 | 432 | HMMWV/ 4WD Pickup | 1 to 3 | 2 | 144 | None | 0 | 0 | 0 | None | | 0 |
| | | | | | Personal Watercraft | 1 | 1 | 72 | | | | | | | | | | | |
| 21 | CRRC Towing and High Speed Maneuver | 1 | 8 | 28 | CRRC | 4 | 4 | 32 | 4WD Pickups / HMMW | 1 | 1 | 8 | None | 0 | 0 | 0 | None | 0 | 0 |
| | | | | | Personal Watercraft | 1 | 1 | 8 | | | | | | | | | | | |
| 22 | CRRC Bay Landing Craft Utility (LCU) Launch and Recover - Bay and Ocean | 1 | 24 | 28 | CRRC | 4 | 4 | 96 | 4WD Pickups / HMMW | 1 | 1 | 24 | None | 0 | 0 | 0 | None | 0 | 0 |
| | | | | | Personal Watercraft | 1 | 1 | 24 | | | | | | | | | | | |
| | | | | | RHIB | 1 | 1 | 24 | | | | | | | | | | | |
| | | | | | LCU | 1 | 1 | 24 | | | | | | | | | | | |
| 23 | CRRC Navigation, Bay and Ocean Runs | 1 | 26 | 40 | CRRC | 6 | 6 | 156 | 4WD Pickups / HMMW | 1 | 1 | 26 | None | 0 | 0 | 0 | None | 0 | 0 |
| | | | | | RHIB | 1 | 1 | 26 | | | | | | | | | | | |
| 24 | Amphibious Raid Course Final Mission | 1 | 24 | 110-130 | LCU | 2 | 2 | 48 | None | 0 | 0 | 0 | None | 0 | 0 | 0 | None | 0 | 0 |
| | | | | | CRRCs | 6-18 | 12 | 288 | | | | | | | | | | | |
| 25 | Amphibious Raid Operations | 3 | 2 | 150 on foot , 20-40 additional | CRRCs | 10-15 | 13 | 26 | HMMWVs | 4-8 | 6 | 12 | CH-53E | 2 to 4 | 3 | 6 | Flares | | 3 |
| | | | | | LPD | 1 | 1 | 2 | 4WD Pickups | 5 to 10 | 8 | 16 | CH-46E | 4 | 4 | 8 | Grenades | | 20 |
| | | | | | LCUs | 1-2 | 2 | 4 | AAVs | 4-8 | 6 | 12 | UH-1N | 1 | 1 | 2 | 9MM | | 210 |
| | | | | | LCACs | 1-2 | 2 | 4 | LAVs | 4-8 | 6 | 12 | | | | | 5.56MM/38CAL | | 60/15 |
| | | | | | Submersibles | 1-2 | 2 | 4 | IFAVs | 4-8 | 6 | 12 | | | | | Diver Recalls | | 3 |
| | | | | | EFV | 4-8 | 6 | 12 | | | | | | | | | | | |

| Scenario | Type Training | Reference Days (a) | Operations (b) | No. of Personnel | Ship/Boat Type | Number of vessels possible | Number of vessels assumed | Vessels per year | Ground Vehicles | Number of vehicles possible | Number of vehicles assumed | Vehicles per year | Aircraft | Number of aircraft possible | Number of aircraft assumed | Aircraft per year | Ordnance | Number of of ordnance possible | Number of ordnance assumed |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 26 | Direct Action (DA) Operations | 3 | 2 | 90 on foot, 20-40 additional | CRRCs | 8-10 | 9 | 18 | Light Wheeled Vehicles | 11 to 20 | 16 | 32 | CH-46E | 6 to 8 | 7 | 14 | Explosives | | 10 |
| | | | | | LPD | 1 | 1 | 2 | | | | | UH-1N | 1 | 1 | 2 | Smoke | | 3 |
| | | | | | Submersibles | 1-2 | 2 | 4 | | | | | | | | | 9MM | | 137 per year |
| | | | | | | | | | | | | | | | | | 5.56MM/38CAL | | 50/10 per year |
| | | | | | | | | | | | | | | | | | Diver Recalls | | 3 |
| 27 | Craft Landing Zone (CLZ) | 1 | 4 | | 1 LCAC per CLZ | 1 | 1 | 4 | HMMWVs | 1 | 1 | 4 | None | 0 | 0 | 0 | Smoke | | 3 |
| **1.5.7** | **Conduct Naval Special Warfare** | | | | | | | | | | | | | | | | | | |
| 28 | Swimmer/Combat Rubber Raiding Craft Over-the-Beach | 4 | 52 | 80 to 20 | RHIBs / CRRCs | 2 to 4 | 3 | 156 | 4WD Pickups | 1-4 | 3 | 156 | SH-60 Helo | 1 | 1 | 52 | Smokes/Flares/Surface Explosives | | 3 flares, 10 grenades |
| | | | | | Rigid, 10-meter craft | 1 | 1 | 52 | | | | | | | | | Small Arms | | 6600/5000 .5 cal/7.62 mm |
| 29 | Over-the-Beach Stalk | 1 | 16 | | CRRCs | 1 | 1 | 16 | 4WD Pickups | 1 | 1 | 16 | SH-60 Helo | 1 | 1 | 16 | None | | |
| | | | | | Boston Whaler | 1 | 1 | 16 | | | | | | | | | | | |
| 30 | Immediate Action Drills | 1 | 8 | Small groups of 8 to 10 | RHIBs | 1 | 1 | 8 | 4WD Pickups | 4 | 4 | 32 | SH-60 Helo | 1 | 1 | 8 | Smokes/Flares/Surface | | 3 flares, 10 grenades |
| | | | | | CRRCs | 1 | 1 | 8 | | | | | | | | | Small Arms | | 5000 rnds 50 cal/7.62 blank |
| 31 | Breacher Training | 1 | 20 | 12 to 40 | None | 0 | | 20 | 4WD Pickups | 3 | 3 | 60 | None | 0 | 0 | 0 | PETN 1.14 | | |
| | | | | | | | | | | | | | | | | | 0.25 | 0 | 0 |
| | | | | | | | | | | | | | | | | | Small Arms - 12gauge | 150 | 150 annually |
| 32 | Amphibious Warfare Exercise | 1 | 50 | | RHIBs | 2 | 2 | 100 | None | 0 | 0 | 0 | None | 0 | 0 | 0 | Smoke Grenades/Flares | | 3 |
| | | | | | MK V | 2 | 2 | 100 | | | | | | | | | | | |
| 33 | Mobility Primary Mission Area | 1 | 200 | | RHIB or MK V | 2 to 4 | 4 | 800 | None | 0 | 0 | 0 | None | 0 | 0 | 0 | Smoke/Flares | | 3 per group |
| 34 | Escape and Evasion | 1 | 20 | | RHIBs | 2 | 2 | 40 | None | 0 | 0 | 0 | None | 0 | 0 | 0 | Smoke/Flares | | 3 per group |
| | | | | | MK V | 2 | 2 | 40 | | | | | | | | | | | |
| **2.2.3** | **Perform Tactical Reconnaissance and Surveillance** | | | | | | | | | | | | | | | | | | |
| 35 | Helicopter Rope Suspension Training/Cast & Recovery Operation | 1 | 124 | 8 to 50 | RHIBs | 1 | 1 | 124 | 4WD Pickups | 2 to 4 | 2 | 248 | SH60 | 1 | 1 | 124 | Smoke Grenades/Flares | | 3 |
| | | | | | CRRCs | 1 to 3 | 2 | | | | | | CH46 | 1 | 1 | 124 | | | |
| 36 | Rappel and Fast Rope Training | 1 | 6 | | None | 0 | 0 | 0 | 4WD Pickups | | 4 | 24 | NONE | 0 | 0 | 0 | None | 0 | 0 |
| 37 | SEAL Delivery Vehicle (SDV)/Advanced Seal Delivery System (ASDS) Certification to Deploy | 14 | 14 | 20 | RHIBs | 2 | 2 | 28 | 4WD Pickups | 2 | 2 | 28 | SH-60 | | 1 | 14 | ≤ 10 lbs C-4 (underwater) | 1 | 1 |
| **4.5.6** | **Construct, Maintain, and Operate Logistics Over-the-Shore** | | | | | | | | | | | | | | | | | | |
| 38 | OPDS | 25 | 6 | 25 to 65 | OUBs | 1-5 | 2 | 12 | HMMWVs | 1 | 1 | 6 | None | 0 | 0 | 0 | None | 0 | 0 |
| | | | | | | | | | 5-ton truck | 1 | 1 | 6 | | | | | | | |
| | | | | | | | | | Dozer | 2 | 2 | 12 | | | | | | | |
| | | | | | | | | | Comm Van | 1 | 1 | 6 | | | | | | | |
| | | | | | | | | | RTV forklift | 1 | 1 | 6 | | | | | | | |
| | | | | | | | | | LARCV | 2 | 2 | 12 | | | | | | | |
| 39 | Amphibious Bulk Liquid Transfer System (ABLTS) | 10 | 4 | 65 | Warping Tug | 1 | 1 | 4 | HMMWVs | 1 | 1 | 4 | None | 0 | 0 | 0 | None | 0 | 0 |
| | | | | | Barge Ferry | 2 | 2 | 8 | 5-ton truck | 1 | 1 | 4 | | | | | | | |
| | | | | | | | | | Van | 1 | 1 | 4 | | | | | | 0 | 0 |
| | | | | | | | | | Dozers | 2 | 2 | 8 | | | | | | | |
| | | | | | | | | | Rough Terrain Forklift | 1 | 1 | 4 | | | | | | | |
| | | | | | | | | | LARCV | 2 | 2 | 8 | | | | | | | |
| 40 | Barge Ferry/Causeway Coxswain Training | 3 | 34 | up to 36 | Barge Ferry | 2 | 2 | 68 | HMMWVs | 1 | 1 | 34 | None | 0 | 0 | 0 | None | 0 | 0 |
| | | | | | | | | | 5-ton truck | 1 | 1 | 34 | | | | | | | |
| | | | | | | | | | Van | 1 | 1 | 34 | | | | | | | |
| | | | | | | | | | Dozer | 2 | 2 | 68 | | | | | | | |
| | | | | | | | | | LARCV | 2 | 2 | 68 | | | | | | | |
| 41 | Causeway Pier Insertion and Retraction | 5 | 9 | 65 to 75 | WTs | 4 | 4 | 36 | HMMWVs | 2 | 2 | 18 | None | 0 | 0 | 0 | None | 0 | 0 |
| | | | | | | | | | 5-ton truck | 1 | 1 | 9 | | | | | | | |
| | | | | | | | | | Van | 1 | 1 | 9 | | | | | | | |
| | | | | | | | | | Rough Terrain Forklift | 1 | 1 | 9 | | | | | | | |
| | | | | | | | | | Dozers | 2 | 2 | 18 | | | | | | | |
| | | | | | | | | | LARCV | 2 | 2 | 18 | | | | | | | |
| 42 | Elevated Causeway System (ELCAS) | 10 | 2 | 75 to 125 | WTs | 2 | 2 | 4 | HMMWVs | 3 to 4 | 4 | 8 | None | 0 | 0 | 0 | None | 0 | 0 |
| | | | | | Personal Watercraft | 2 | 2 | 4 | 5-ton truck | 1 to 3 | 3 | 6 | | | | | | | |
| | | | | | | | | | Light Trucks | | 4 | 8 | | | | | | | |
| | | | | | LCM | 1 | 1 | 2 | Dozers | 2 | 2 | 4 | | | | | | | |
| | | | | | | | | | Forklifts | 1 | 1 | 2 | | | | | | | |
| | | | | | | | | | 75-Ton Crane | 2 | 2 | 4 | | | | | | | |
| | | | | | | | | | Pile Driver | 2 | 2 | 4 | | | | | | | |
| | | | | | | | | | ambulance | 1 | 1 | 2 | | | | | | | |
| | | | | | | | | | water buffalo | 1 | 1 | 2 | | | | | | | |
| | | | | | | | | | 140-ton crane | 1 | 1 | 2 | | | | | | | |
| | | | | | | | | | 30-ton crane | 2 | 2 | 4 | | | | | | | |
| | | | | | | | | | LARCV | 2 | 2 | 4 | | | | | | | |

| Scenario | Type Training | Reference Days (a) | Operations (b) | No. of Personnel | Ship/Boat Type | Number of vessels possible | Number of vessels assumed | Vessels per year | Ground Vehicles | Number of vehicles possible | Number of vehicles assumed | Vehicles per year | Aircraft | Number of aircraft possible | Number of aircraft assumed | Aircraft per year | Ordnance | Number of ordnance possible | Number of ordnance assumed |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | Air compressors | 2 | 2 | 4 | | | | | | | |
| | | | | | | | | | Pile Extractor | 1 | 1 | 2 | | | | | | | |
| 43 | Establish Beach Party Command Post | 4 | 16 | 19 on foot | None | 2 | 2 | 32 | HMMWVs | 3 | 3 | 48 | None | 0 | 0 | 0 | 5.56 caliber rounds | | 30 |
| | | | | | | | | | 5-ton truck | 1 | 1 | 16 | | | | | 7.62 caliber blanks | | 100 |
| | | | | | | | | | Dozer | 1 | 1 | 16 | | | | | | | |
| | | | | | | | | | Generators/various | 2 | 2 | 32 | | | | | | | |
| | | | | | | | | | Heaters | 2 | 2 | | | | | | | | |
| | | | | | | | | | LARCV | 2 | 2 | 32 | | | | | | | |
| 44 | Sterngate Marriage to Amphibious Ship/LCU | 1 | 40 | | LCU | 2 | 2 | 80 | None | 0 | 0 | 0 | None | 0 | 0 | 0 | None | 0 | 0 |
| 45 | LCU/LCM Beaching | 1 | 60 | | LCU | 0 to 2 | 1 | 60 | HMMWVs | | 1 | 60 | None | 0 | 0 | 0 | None | 0 | 0 |
| | | | | | LCM-8 | 0 to 2 | 1 | 60 | 5-ton truck | | 1 | 60 | | | | | | | |
| | | | | | | | | | Dozer | | 1 | 60 | | | | | | | |
| | | | | | | | | | LARCV | | 1 | 60 | | | | | | | |
| 46 | LCU/LCM Towing/Being Towed | 1 | 60 | | LCU | 2 | 2 | 120 | Dozer | 1 | 1 | 60 | None | 0 | 0 | 0 | None | 0 | 0 |
| | | | | | LCM-8 | 2 | 2 | 120 | | | | | | | | | | | |
| 47 | Communications Training | 2 | 1 | 60 persons, but they work in two shifts | None | 0 | 0 | 0 | 4WD Pickups | | 4 | 4 | None | 0 | 0 | 0 | | | |
| | | | | | | | | | RTVs | | 4 | 4 | | | | | | | |
| | | | | | | | | | Bus | 2 | 2 | 2 | | | | | | | |
| | | | | | | | | | Tractor with flat bed | 1 | 1 | 1 | | | | | | | |
| 48 | Field Training Exercise with a Beach Camp | 14 | 1 | 19 | None | | 2 | 2 | HMMWVs | | 2 | 2 | None | 0 | 0 | 0 | 5.56 caliber rounds | | 30 |
| | | | | | | | | | 5-ton truck | | 1 | 1 | | | | | 7.62 caliber blanks | | 100 |
| | | | | | | | | | Dozer | | 2 | 2 | | | | | | | |
| | | | | | | | | | 4WD Pickups | 10 | 10 | 10 | | | | | | | |
| | | | | | | | | | Fuel Truck | 1 | 1 | 1 | | | | | | | |
| | | | | | | | | | 20-ton Stake Trucks | 1 | 1 | 1 | | | | | | | |
| | | | | | | | | | 50-ton Low-bed Trucks | 1 | 1 | 1 | | | | | | | |
| | | | | | | | | | Wheeled Loaders | 2 | 2 | 2 | | | | | | | |
| | | | | | | | | | Generators/various | 23 | 23 | 23 | | | | | | | |
| | | | | | | | | | Heaters | 117 | 117 | 117 | | | | | | | |
| | | | | | | | | | Welder | 6 | 6 | 6 | | | | | | | |
| | | | | | | | | | LARCV | | 2 | 2 | | | | | | | |
| 49 | Maritime Pre-positioning Ships (MPS) Offload | 5 | 1 | 72 | LCM-8 | | 2 | 2 | HMMWVs | | 2 | 2 | None | 0 | 0 | 0 | None | 0 | 0 |
| | | | | | WTs | | 2 | 2 | 5-ton truck | | 1 | 1 | | | | | | | |
| | | | | | Barge Ferry | | 2 | 2 | Dozer | | 1 | 1 | | | | | | | |
| | | | | | | | 1 | 1 | 4WD Pickups | | 3 | 3 | | | | | | | |
| | | | | | | | | | LARCV | | 1 | 1 | | | | | | | |
| 50 | Reverse Osmosis Water Purification Unit | 4 | 4 | 6 | None | 0 | 0 | 0 | 4WD Pickups | | 2 | 8 | None | 0 | 0 | 0 | None | 0 | 0 |
| | | | | | | | | | RTVs | | 6 | 24 | | | | | | | |
| | | | | | | | | | Generator | | 1 | 4 | | | | | | | |
| | | | | | | | | | Flatbed Truck | 1 | 1 | 4 | | | | | | | |
| 51 | Roll-on/Roll-off Discharge Facility | 5 | 1 | 40 | WTs | | 2 | 2 | HMMWVs/Jeeps | | 3 | 3 | None | 0 | 0 | 0 | None | 0 | 0 |
| | | | | | Personal Watercraft | | 2 | 2 | 6-ton truck | | 1 | 1 | | | | | | | |
| | | | | | | | 2 | 2 | Dozer | | 1 | 1 | | | | | | | |
| | | | | | | | | | Cranes | | 2 | 2 | | | | | | | |
| | | | | | | | | | RTVs | | 2 | 2 | | | | | | | |
| | | | | | | | | | LARCV | | 2 | 2 | | | | | | | |
| 52 | MPF Utility Boat Operator Course | 9 | 2 | 15 | MPF Utility Boat | 2 | 2 | 4 | Dozer | 1 | 1 | 2 | None | 0 | 0 | 0 | None | 0 | 0 |
| | | | | | | 2 | 2 | 4 | Van | 1 | 1 | 2 | | | | | | | |
| | | | | | | | | | LARCV | 2 | 2 | 4 | | | | | | | |
| 53 | LARC V Operator Training | 6 | 1 | 10 | None | 2 | 2 | 2 | LARCV | 2 | 2 | 2 | None | 0 | 0 | 0 | None | 0 | 0 |
| **4.9.1** | **Conduct Mission Area Training** | | | | | | | | | | | | | | | | | | |
| | **NSW Diving and Beach Operations** | | | | | | | | | | | | | | | | | | |
| 54 | Lung Automatic Rebreather (LAR) V Closed Circuit Breathing Diving | 1 | 126 | | RHIBs | 5 | 5 | 630 | 4WD Pickups | 3 | 3 | 378 | None | 0 | 0 | 0 | Diver Recall | 1 | 1 |
| | | | | | | | | | Bus | 2 | 2 | 252 | | | | | | | |
| 55 | Open Circuit Breathing Diving | 1 | 12 | 60 | RHIBs | 5 | 5 | 60 | 4WD Pickups | 3 | 3 | 36 | None | 0 | 0 | 0 | Diver Recall | 1 | 1 |
| | | | | | LCU | 1 | 1 | 12 | Bus | 2 | 2 | 24 | | | | | | | |
| 56 | OTB Field Training Exercise | 5 | 36 | 60 | CRRCs | 5 | 5 | 180 | 4WD Pickups | 3 | 3 | 108 | None | 0 | 0 | 0 | Small arm | | 15000 7.62mm; 19800 .5cal ANNUAL |
| 57 | Rock Portage | 1 | 18 | 60 | CRRCs | 5 to 8 | 7 | 126 | 4WD Pickups | 1 | 1 | 18 | None | 0 | 0 | 0 | Smoke Grenades/Flares | | 3 |
| | | | | | IBS | 8 to 10 | 9 | 162 | | | | | | | | | | | |
| | **NSW Land Warfare** | | | | | | | | | | | | | | | | | | |
| 58 | Land Patrolling | 1 | 18 | 60 | None | 0 | 0 | 0 | 4WD Pickups | 2 | 2 | 36 | None | 0 | 0 | 0 | None | 0 | 0 |
| 59 | Immediate Action Drills | 1 | 5 | 60 | None | 0 | 0 | 0 | 4WD Pickups | 2 | 2 | 10 | None | 0 | 0 | 0 | 50CAL/7.62 BLANK | | 5000 RNDS per operation (25000 rounds each annually) per type |
| | **NSW Advanced Training** | | | | | | | | | | | | | | | | | | |
| 60 | Over the Beach Insertion / Photo Reconnaissance | 1 | 31 | 20 | RHIB/CRRC | 2 | 1 | 31 | 4WD Pickup | 2 | 2 | 62 | None | 0 | 0 | 0 | Small arms/blanks | | 10 9 mm blanks; 10 5.56 blanks per operation |
| | | | | | Kayak | 1 | 1 | 31 | | | | | | | | | | | |

| Scenario | Type Training | Reference Days (a) | Operations (b) | No. of Personnel | Ship/Boat Type | Number of vessels possible | Number of vessels assumed | Vessels per year | Ground Vehicles | Number of vehicles possible | Number of vehicles assumed | Vehicles per year | Aircraft | Number of aircraft possible | Number of aircraft assumed | Aircraft per year | Ordnance | Number of of ordnance possible | Number of ordnance assumed |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 61 | Photo Image Capture | 14 | 3 | 20 | None | 0 | 0 | 0 | 4WD Pickups | 2 | 2 | 28 | None | 0 | 0 | 0 | Small arms/blanks | | 10 9 mm blanks; 10 5.56 blanks per operation |
| 62 | Field Skills (Observation Drill, Sketching, Range Estimation) | 1 | 22 | 20 | None | 0 | 0 | 0 | 4WD Pickups | 2 | 2 | 44 | None | 0 | 0 | 0 | Small arms/blanks | | 10 9 mm blanks; 10 5.56 blanks per operation |
| 63 | Stalking, Movement and Hide-Sites | 5 | 8 | 14 | None | 0 | 0 | 0 | 4WD Pickups | 3 | 3 | 24 | None | 0 | 0 | 0 | None | 0 | 0 |
| 64 | CQC/CQD | 1 | 109 | 580 | CRRCs | | 5 | | 4WD Pickups | | 5 | 545 | SH-60 | 1 | 1 | 109 | Small Arms<br>Small Arms<br>Grenades (flash crash)<br>Explosives (<1lb), accounted for in Breacher Training | | 57600 9 MM simunition annual; 20000 5.56 simunition annual;<br>4000 .38 cal<br>3 |
| 65 | Communications | 5 | 6 | 20 | None | 0 | 0 | 0 | 4WD Pickups | 6 | 6 | 36 | None | 0 | 0 | 0 | None | 0 | 0 |
| 66 | Unmanned Aerial Vehicle (UAV) Training | 5 | 12 | 6 | None | 0 | 0 | 0 | 4WD Pickups | 1 | 1 | 12 | UAV | 2 | 2 | 24 | none | 0 | 0 |
| 67 | Around the World Training | 1 | 6 | 60 | CRRCs<br>Sea Kayaks | 7<br>5 | 7<br>5 | 42<br>30 | 4WD Pickups | 4 | 4 | 24 | None | 0 | 0 | 0 | none | 0 | 0 |
| **4.9.4** | **Provide/Execute Training for U.S. and Other Nation Units and Individuals<br>NSW Physical Fitness Training** | | | | | | | | | | | | | | | | | | |
| 68 | Physical Training Runs | 1 | 464 | 30 to 150 averaging 60 | None | 0 | 0 | 0 | 4WD Pickups | 2-3 | 3 | 1392 | None | 0 | 0 | 0 | None | 0 | 0 |
| 69 | Physical Conditioning Training Exercise | 1 | 280 | 60 to 150 (avg 60) | CRRCs / Propeller Surface Craft | 2-4 | 3 | 840 | 4WD Pickups | 2 | 2 | 560 | None | 0 | 0 | 0 | None | 0 | 0 |
| 70 | Swim Training | 1 | 170 | 48-60 | RHIBs | 5 | 5 | 850 | 4WD Pickups | 1 | 1 | 170 | None | 0 | 0 | 0 | None | 0 | 0 |
| 71 | Hell Week | 5 | 6 | 60 | CRRCs | 5 | 5 | 30 | 4WD Pickups | 3 | 3 | 18 | None | 0 | 0 | 0 | Smokes<br>Grenade Simulators<br>White Para Flares<br>7.62 Blank (A111)<br>50 CAL Blank | | 128 per year<br>200 per year<br>12 per year<br>27000 per year<br>2000 per year |
| 72 | Rucksack March | 1 | 54 | 60 | None | 0 | 0 | 0 | 4WD Pickups | 2-3 | 3 | 162 | None | 0 | 0 | 0 | None | 0 | 0 |
| 73 | Monster Mash | 1 | 6 | 60 | CRRCs | | 3 | 18 | 4WD Pickups | 3 | 3 | 18 | None | 0 | 0 | 0 | None | | |
| **4.12.6** | **Provide Industrial and Environmental Health Services** | | | | | | | | | | | | | | | | | | |
| 74 | Conduct Environmental Health Site Assessment | 3 | 3 | 14 | None | 0 | 0 | 0 | 4WD Pickups<br>5-ton truck<br>3/4-ton trailer<br>small trailers | 4<br>1<br>1<br>3 | 4<br>1<br>1<br>3 | 12<br>3<br>3<br>9 | None | 0 | 0 | 0 | None | 0 | 0 |
| **6.1.1** | **Conduct Explosive Ordnance Disposal** | | | | | | | | | | | | | | | | | | |
| 75 | Conventional Ordnance/Improvised Explosive Device Response | 1 | 64 | 9 | None | 0 | 0 | 0 | 4WD Pickups | 2 | 2 | 128 | None | 0 | 0 | 0 | | | |
| 76 | Land Mine Detection/Neutralization | 1 | 24 | 8 to 10 | None | 0 | 0 | 0 | 4WD Pickups / Vans | 2 | 2 | 48 | None | 0 | 0 | 0 | | | |
| **6.3.1** | **Force Protection: Protect and Secure Area of Operations** | | | | | | | | | | | | | | | | | | |
| 77 | Field Training Exercise (FTX) e.g. SEAHAWK | 14 | 53 | 50-1000 | Boston Whalers | 0 to 24 | 12 | 144 | 4WD Pickups<br>Generators<br>Forklift | 7 to 85<br>3 to 16<br>8 | | 140<br>176<br>8 | None | 0 | 0 | 0 | 0.50 cal blanks<br>Grenades/flares<br>M16 Rounds<br>M60 Rounds<br>9mm Rounds | | 15650 per year<br>66 per year<br>8250 per year<br>8250 per year<br>6600 per year |
| **6.3.3** | **Combat Terrorism** | | | | | | | | | | | | | | | | | | |
| 78 | Small Boat Attack | 1 | 30 | | Boston Whalers<br>surface vessel dropping anchor and 3 shots (<br>18' Bayliner | 1<br>1<br>1 | 1<br>1<br>1 | 30<br>30<br>30 | None | 0 | 0 | 0 | None | 0 | 0 | 0 | .50 cal rounds | 350 | 350 per exercise |
| | Totals | | 3937 | | | | | 10138 | | | | 8126 | | | | 764 | | | |

(a) Days = the number of days per operation
(b) Operations = the number of operations per year

| Scenario | Type Training | Reference | Days (a) | Operations (b) | Aircraft | Number | Aircraft Time on Range (hrs) | Emissions Factors (lb/operation) (c) | | | | | Emissions (lbs) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Hours | CO | NOx | ROG | SOx | PM10 | CO | Nox | ROG | Sox | PM |
| **1.1.2** | **Conduct Maneuver - Move Forces** | | | | | | | | | | | | | | | | |
| 1 | Anchoring | | 1 | 72 | None | 0 | | | | | | | | | | | |
| 2 | Towing | | 1 | 30 | None | 0 | | | | | | | | | | | |
| 3 | Moor to Buoy | | 1 | 36 | None | 0 | | | | | | | | | | | |
| **1.3.1** | **Perform Mine Countermeasures** | | | | | | | | | | | | | | | | |
| 4 | Parachute Operations | | 1 | 216 | SH60 | 1 | 1.0 | 7.50 | 7.68 | 0.66 | 0.48 | 5.04 | 1620 | 1658.88 | 142.56 | 103.68 | 1088.64 |
| 5 | MCM Operations | | 1 | 32 | None | 0 | | | | | | | | | | | |
| 6 | Floating Mine Operations | | 1 | 25 | SH-60 - 2 Hours | 1 | 2.0 | 7.50 | 7.68 | 0.66 | 0.48 | 5.04 | 375 | 384 | 33 | 24 | 252 |
| 7 | Dive Platoon | | 1 | 8 | SH-60 - 2 Hours | 1 | 2.0 | 7.50 | 7.68 | 0.66 | 0.48 | 5.04 | 120 | 122.88 | 10.56 | 7.68 | 80.64 |
| 8 | Very Shallow Water (VSW) Operator Course | | 8 | 4 | None | 0 | | | | | | | | | | | |
| 9 | VSW Mine Countermeasure Operations | | 1 | 120 | None | 0 | | | | | | | | | | | |
| 10 | Autonomous Underwater Vehicle (AUV) Operations/UUV Operations | | 1 | 120 | None | 0 | | | | | | | | | | | |
| 11 | MK8 Marine Mammal/MMS Operations | | 1 | 175 | None | 0 | | | | | | | | | | | |
| 12 | Mine Neutralization | | 1 | 4 | SH-60 - 2 Hours | 1 | 2.0 | 7.50 | 7.68 | 0.66 | 0.48 | 5.04 | 60 | 61.44 | 5.28 | 3.84 | 40.32 |
| **1.4.6** | **Conduct Maritime Interception** | | | | | | | | | | | | | | | | |
| 13 | Visit, Board, Search and Seizure | | 1 | 30 | None | 0 | | | | | | | | | | | |
| **1.5.4** | **Conduct Amphibious Operations** | | | | | | | | | | | | | | | | |
| 14 | Small Boat Handling | | 1 | 94 | None | 0 | | | | | | | | | | | |
| 15 | Swimmer Conditioning - Bay and Ocean with fins | | 1 | 189 | None | 0 | | | | | | | | | | | |
| 16 | Basic Reconnaissance Course Final Mission | | 1 | 8 | SH60 | 1 | 4.0 | 7.50 | 7.68 | 0.66 | 0.48 | 5.04 | 240 | 245.76 | 21.12 | 15.36 | 161.28 |
| 17 | Obstacle Course | | 1 | 138 | None | 0 | | | | | | | | | | | |
| 18 | Hydrographic Reconnaissance | | 1 | 40 | None | 0 | | | | | | | | | | | |
| 19 | Surf Observations (SUROBS) | | 1 | 116 | None | 0 | | | | | | | | | | | |
| 20 | CRRC Inflatable Boat Small (IBS)/Surf Passage/Boat Team Organization and Function | | 1 | 72 | None | 0 | | | | | | | | | | | |
| 21 | CRRC Towing and High Speed Maneuver | | 1 | 8 | None | 0 | | | | | | | | | | | |
| 22 | CRRC Bay Landing Craft Utility (LCU) Launch and Recover - Bay and Ocean | | 1 | 24 | None | 0 | | | | | | | | | | | |
| 23 | CRRC Navigation, Bay and Ocean Runs | | 1 | 26 | None | 0 | | | | | | | | | | | |
| 24 | Amphibious Raid Course Final Mission | | 1 | 24 | None | 0 | | | | | | | | | | | |
| 25 | Amphibious Raid Operations | | 3 | 2 | CH-53E | 3 | 4.0 | 9.51 | 36.07 | 0.67 | 1.79 | 9.87 | 228.24 | 865.68 | 16.08 | 42.96 | 236.88 |
| | | | | | CH-46E | 4 | 4.0 | 22.109 | 4.41 | 3.84 | 0.45 | 1.99 | 707.488 | 141.12 | 122.88 | 14.4 | 63.68 |
| | | | | | CH-53E T&G | 3 | 1.0 | 0.77 | 2.11 | 0.13 | 0.11 | 0.61 | 4.62 | 12.66 | 0.78 | 0.66 | 3.66 |
| | | | | | CH-46E T&G | 4 | 1.0 | 1.85 | 0.4 | 0.34 | 0.04 | 0.19 | 14.8 | 3.2 | 2.72 | 0.32 | 1.52 |
| | | | | | UH-1N | 1 | 4.0 | 0.7 | 4.01 | 0.09 | 0.28 | 2.91 | 5.6 | 32.08 | 0.72 | 2.24 | 23.28 |
| 26 | Direct Action (DA) Operations | | 3 | 2 | CH-46E | 7 | 4.0 | 22.109 | 4.41 | 3.84 | 0.45 | 1.99 | 1238.104 | 246.96 | 215.04 | 25.2 | 111.44 |
| | | | | | UH-1N | 1 | 4.0 | 0.7 | 4.01 | 0.09 | 0.28 | 2.91 | 5.6 | 32.08 | 0.72 | 2.24 | 23.28 |
| 27 | Craft Landing Zone (CLZ) | | 1 | 4 | None | 0 | | | | | | | | | | | |
| **1.5.7** | **Conduct Naval Special Warfare** | | | | | | | | | | | | | | | | |
| 28 | Swimmer/Combat Rubber Raiding Craft Over-the-Beach | | 4 | 52 | SH-60 Helo | 1 | 1.0 | 7.50 | 7.68 | 0.66 | 0.48 | 5.04 | 1560 | 1597.44 | 137.28 | 99.84 | 1048.32 |
| 29 | Over-the-Beach Stalk | | 1 | 16 | SH-60 Helo | 1 | 1.0 | 7.50 | 7.68 | 0.66 | 0.48 | 5.04 | 120 | 122.88 | 10.56 | 7.68 | 80.64 |
| 30 | Immediate Action Drills | | 1 | 8 | SH-60 Helo | 1 | 1.0 | 7.50 | 7.68 | 0.66 | 0.48 | 5.04 | 60 | 61.44 | 5.28 | 3.84 | 40.32 |
| 31 | Breacher Training | | 1 | 20 | None | | | | | | | | | | | | |
| 32 | Amphibious Warfare Exercise | | 1 | 50 | None | | | | | | | | | | | | |
| 33 | Mobility Primary Mission Area | | 1 | 200 | None | | | | | | | | | | | | |
| 34 | Escape and Evasion | | 1 | 20 | None | | | | | | | | | | | | |
| **2.2.3** | **Perform Tactical Reconnaissance and Surveillance** | | | | | | | | | | | | | | | | |
| 35 | Helicopter Rope Suspension Training/Cast & Recovery Operation | | 1 | 124 | SH60 | 1 | 1.0 | 0.81 | 1.03 | 0.08 | 0.06 | 0.64 | 100.44 | 127.72 | 9.92 | 7.44 | 79.36 |
| | | | 1 | 124 | CH46 | 1 | 1.0 | 1.87 | 0.39 | 0.35 | 0.04 | 0.19 | 231.88 | 48.36 | 43.4 | 4.96 | 23.56 |
| 36 | Rappel and Fast Rope Training | | 1 | 6 | NONE | 0 | | | | | | | | | | | |
| 37 | SEAL Delivery Vehicle (SDV)/Advanced Seal Delivery System (ASDS) Certification to Deploy | | 14 | 14 | SH-60 | 1 | 1.0 | 7.50 | 7.68 | 0.66 | 0.48 | 5.04 | 1470 | 1505.28 | 129.36 | 94.08 | 987.84 |
| **4.5.6** | **Construct, Maintain, and Operate Logistics Over-the-Shore** | | | | | | | | | | | | | | | | |
| 38 | OPDS | | 25 | 6 | None | 0 | | | | | | | | | | | |
| 39 | Amphibious Bulk Liquid Transfer System (ABLTS) | | 10 | 4 | None | 0 | | | | | | | | | | | |
| 40 | Barge Ferry/Causeway Coxswain Training | | 3 | 34 | None | 0 | | | | | | | | | | | |
| 41 | Causeway Pier Insertion and Retraction | | 5 | 9 | None | 0 | | | | | | | | | | | |
| 42 | Elevated Causeway System (ELCAS) | | 10 | 2 | None | 0 | | | | | | | | | | | |
| 43 | Establish Beach Party Command Post | | 4 | 16 | None | 0 | | | | | | | | | | | |
| 44 | Sterngate Marriage to Amphibious Ship/LCU | | 1 | 40 | None | 0 | | | | | | | | | | | |
| 45 | LCU/LCM Beaching | | 1 | 60 | None | 0 | | | | | | | | | | | |
| 46 | LCU/LCM Towing/Being Towed | | 1 | 60 | None | 0 | | | | | | | | | | | |
| 47 | Communications Training | | 2 | 1 | None | 0 | | | | | | | | | | | |
| 48 | Field Training Exercise with a Beach Camp | | 14 | 1 | None | 0 | | | | | | | | | | | |
| 49 | Maritime Pre-positioning Ships (MPS) Offload | | 5 | 1 | None | 0 | | | | | | | | | | | |
| 50 | Reverse Osmosis Water Purification Unit | | 4 | 4 | None | 0 | | | | | | | | | | | |

Table C-2
Aircraft Emissions
No Action Alternative

| Scenario | Type Training | Reference | Days (a) | Operations (b) | Aircraft | Number | Aircraft Time on Range (hrs) | Emissions Factors (lb/operation) (c) | | | | | Emissions (lbs) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Hours | CO | NOx | ROG | SOx | PM10 | CO | Nox | ROG | Sox | PM |
| 51 | Roll-on/Roll-off Discharge Facility | | 5 | 1 | None | 0 | | | | | | | | | | | |
| 52 | MPF Utility Boat Operator Course | | 9 | 2 | None | 0 | | | | | | | | | | | |
| 53 | LARC V Operator Training | | 6 | 1 | None | 0 | | | | | | | | | | | |
| **4.9.1** | **Conduct Mission Area Training** | | | | | | | | | | | | | | | | |
| | **NSW Diving and Beach Operations** | | | | | | | | | | | | | | | | |
| 54 | Lung Automatic Rebreather (LAR) V Closed Circuit Breathing Diving | | 1 | 126 | None | 0 | | | | | | | | | | | |
| 55 | Open Circuit Breathing Diving | | 1 | 12 | None | 0 | | | | | | | | | | | |
| 56 | OTB Field Training Exercise | | 5 | 36 | None | 0 | | | | | | | | | | | |
| 57 | Rock Portage | | 1 | 18 | None | 0 | | | | | | | | | | | |
| | **NSW Land Warfare** | | | | | | | | | | | | | | | | |
| 58 | Land Patrolling | | 1 | 18 | None | 0 | | | | | | | | | | | |
| 59 | Immediate Action Drills | | 1 | 5 | None | 0 | | | | | | | | | | | |
| | **NSW Advanced Training** | | | | | | | | | | | | | | | | |
| 60 | Over the Beach Insertion / Photo Reconnaissance | | 1 | 31 | None | 0 | | | | | | | | | | | |
| 61 | Photo Image Capture | | 14 | 3 | None | 0 | | | | | | | | | | | |
| 62 | Field Skills (Observation Drill, Sketching, Range Estimation) | | 1 | 22 | None | 0 | | | | | | | | | | | |
| 63 | Stalking, Movement and Hide-Sites | | 5 | 8 | None | 0 | | | | | | | | | | | |
| 64 | CQC/CQD | | 1 | 109 | SH-60 | 1 | 3.0 | 7.5 | 7.68 | 0.66 | 0.48 | 5.04 | 3793.2 | 2881.96 | 368.42 | 189.66 | 1898.78 |
| 65 | Communications | | 5 | 6 | None | 0 | | | | | | | | | | | |
| 66 | Unmanned Aerial Vehicle (UAV) Training | | 5 | 12 | UAV | 2 | | | | | | | | | | | |
| 67 | Around the World Training | | 1 | 6 | None | 0 | | | | | | | | | | | |
| **4.9.4** | **Provide/Execute Training for U.S. and Other Nation Units and Individuals** | | | | | | | | | | | | | | | | |
| | **NSW Physical Fitness Training** | | | | | | | | | | | | | | | | |
| 68 | Physical Training Runs | | 1 | 464 | None | 0 | | | | | | | | | | | |
| 69 | Physical Conditioning Training Exercise | | 1 | 280 | None | 0 | | | | | | | | | | | |
| 70 | Swim Training | | 1 | 170 | None | 0 | | | | | | | | | | | |
| 71 | Hell Week | | 5 | 6 | None | 0 | | | | | | | | | | | |
| 72 | Rucksack March | | 1 | 54 | None | 0 | | | | | | | | | | | |
| 73 | Monster Mash | | 1 | 6 | None | 0 | | | | | | | | | | | |
| **4.12.6** | **Provide Industrial and Environmental Health Services** | | | | | | | | | | | | | | | | |
| 74 | Conduct Environmental Health Site Assessment | | 3 | 3 | None | 0 | | | | | | | | | | | |
| **6.1.1** | **Conduct Explosive Ordnance Disposal** | | | | | | | | | | | | | | | | |
| 75 | Conventional Ordnance/Improvised Explosive Device Response | | 1 | 64 | None | | | | | | | | | | | | |
| 76 | Land Mine Detection/Neutralization | | 1 | 24 | None | | | | | | | | | | | | |
| **6.3.1** | **Force Protection: Protect and Secure Area of Operations** | | | | | | | | | | | | | | | | |
| 77 | Field Training Exercise (FTX) e.g. SEAHAWK | | 14 | 53 | None | 0 | | | | | | | | | | | |
| **6.3.3** | **Combat Terrorism** | | | | | | | | | | | | | | | | |
| 78 | Small Boat Attack | | 1 | 30 | None | 0 | | | | | | | | | | | |
| | | | | | | | | | | **pounds/year** | | | **11954.972** | **10151.82** | **1275.68** | **650.08** | **6245.44** |
| | | | | | | | | | | **tons/year** | | | **5.98** | **5.08** | **0.64** | **0.33** | **3.12** |

Assumptions: Assume that SH-60 and CH-46 operation for Cast and Recovery are Special Personnel Insertion and Extraction Rig operations.
Assume 4 hours of cruise time for Amphibious Raid Operations, and one touch and go operation
SH60 from AESO Memorandum Report No. 9929, February 1999
CH53 from AESO Memorandum Report No. 9822 Rev C, February 2000
CH46 from AESO Memorandum Report No. 9816 Rev F, January 2001
UH1N from AESO Memorandum Report No. 9904 Rev A, May 1999
AH-1W from AESO Memorandum Report No. 9824 Rev A, April 1999
Assume Aircraft participate for one day during Amphibious Raid Operations and Direct Action Operations
Assume 1 LTO and 3 hours of cruise for CQC/CQD SH-60 operation.
(a) Days = the number of days per operation
(b) Operations = the number of operations per year

| Scenario | Type Training | Reference | Days (a) | Operations (b) | Ship/Boat Type | Number | Ship Time on Range (hrs) (e) | Engines and Generators | | | | Ave. Speed (Knots) | Power Level (%) or horsepower | Engines on Line | Generator - Load (kW) | Emissions Factors (lb/hr) (c) | | | | | Emissions, (lbs/year) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Hours | Propulsion | No. | Generator | No. | | | | | CO | NOx | ROG | SOx | PM10 | CO | Nox | ROG | Sox | PM |
| **1.1.2** | **Conduct Maneuver - Move Forces** | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | Anchoring | | 1 | 72 | RHIB | 1 | 4 | Caterpillar 3126 Diesels | 2 | None | 0 | 1-2 | 600 | 2 | NA | 0.04 | 1.59 | 0.01 | 0.17 | 0.02 | 11.52 | 457.92 | 2.88 | 48.96 | 5.76 |
| | | | 1 | 72 | Ship (DDG or CG) | 1 | 4 | GE LM 2500 | 4 | Allison 501-K34, 2,000 kW ea | 3 | 4-6 | 2.5% | 2 | 2@1300kW ea | 102.98 | 47.34 | 8.10 | 17.04 | 2.35 | 29658.24 | 13633.92 | 2332.8 | 4907.52 | 676.8 |
| 2 | Towing | | 1 | 30 | Foss Tug | 1 | 4 | Foster Wheeler/ Babcock & Wilcox | 2 | NA - No separate emissions | 0 | 7 | 25% | 2 | NA | 1.85 | 10.89 | 1.38 | 32.76 | 6.57 | 221.44713 | 1306.538 | 166.0853 | 3930.686 | 788.9054 |
| | | | 1 | 30 | Ship (DDG or CG) | 1 | 4 | GE LM 2500 | 4 | Allison 501-K34, 2,000 kW ea | 3 | 4-6 | 2.5% | 2 | 2@1300kW ea | 102.98 | 47.34 | 8.10 | 17.04 | 2.35 | 12357.6 | 5680.8 | 972 | 2044.8 | 282 |
| 3 | Moor to Buoy | | 1 | 36 | RHIB | 1 | 4 | Caterpillar 3126 Diesels | 2 | None | 0 | 1-2 | 600 | 2 | NA | 0.04 | 1.59 | 0.01 | 0.17 | 0.02 | 5.76 | 228.96 | 1.44 | 24.48 | 2.88 |
| | | | 1 | 36 | Ship (DDG or CG) | 1 | 4 | GE LM 2500 | 4 | Allison 501-K34, 2,000 kW ea | 3 | 4-6 | 2.5% | 2 | 2@1300kW ea | 102.98 | 47.34 | 8.10 | 17.04 | 2.35 | 14829.12 | 6816.96 | 1166.4 | 2453.76 | 338.4 |
| **1.3.1** | **Perform Mine Countermeasures** | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | Parachute Operations | | 1 | 216 | RHIBs | 3 | 4 | Caterpillar 3126 Diesels | 2 | None | 0 | 1-2 | 600 | 2 | NA | 0.04 | 1.59 | 0.01 | 0.17 | 0.02 | 103.68 | 4121.28 | 25.92 | 440.64 | 51.84 |
| 5 | MCM Operations | | 1 | 32 | Zodiacs | 1 | 4 | OMC Outboard, 55 hp (d) | 1 | None | 0 | 2 | 600-800 | 1 | NA | 8.982561 | 0.859697 | 5.148482 | 0.002183 | 1.234617 | 1149.7679 | 110.0412 | 659.0057 | 0.279371 | 158.031 |
| 6 | Floating Mine Operations | | 1 | 25 | RHIBs | 2 | 4 | Caterpillar 3126 Diesels | 2 | None | 0 | 1-2 | 600 | 2 | NA | 0.04 | 1.59 | 0.01 | 0.17 | 0.02 | 8 | 318 | 2 | 34 | 4 |
| 7 | Dive Platoon | | 1 | 8 | RHIB | 2 | 4 | Caterpillar 3126 Diesels | 2 | None | 0 | 1-2 | 600 | 2 | NA | 0.04 | 1.59 | 0.01 | 0.17 | 0.02 | 2.56 | 101.76 | 0.64 | 10.88 | 1.28 |
| 8 | Very Shallow Water (VSW) Operator Course | | 8 | 4 | RHIBs / Water-Jet Driven Craft | 2 | 2 | Caterpillar 3126 Diesels | 2 | None | 0 | 1-2 | 600 | 2 | NA | 0.04 | 1.59 | 0.01 | 0.17 | 0.02 | 5.12 | 203.52 | 1.28 | 21.76 | 2.56 |
| 9 | VSW Mine Countermeasure Operations | | 1 | 120 | RHIBs / Water-Jet Driven Craft | 3 | 2 | Caterpillar 3126 Diesels | 2 | None | 0 | 1-2 | 600 | 2 | NA | 0.04 | 1.59 | 0.01 | 0.17 | 0.02 | 28.8 | 1144.8 | 7.2 | 122.4 | 14.4 |
| 10 | Autonomous Underwater Vehicle (AUV) Operations/UUV Operatio | | 1 | 120 | RHIBs / Water-Jet Driven Craft | 2 | 2 | Caterpillar 3126 Diesels | 2 | None | 0 | 1-2 | 600 | 2 | NA | 0.04 | 1.59 | 0.01 | 0.17 | 0.02 | 19.2 | 763.2 | 4.8 | 81.6 | 9.6 |
| | | | 1 | 120 | Submersible | 2 | 2 | | | | | | | | | | | | | | | | | | |
| 11 | MK8 Marine Mammal/MMS Operations | | 1 | 175 | RHIBs / Water-Jet Driven Craft | 4 | 2 | Caterpillar 3126 Diesels | 2 | None | 0 | 1-2 | 600 | 2 | NA | 0.04 | 1.59 | 0.01 | 0.17 | 0.02 | 56 | 2226 | 14 | 238 | 28 |
| 12 | Mine Neutralization | | 1 | 4 | RHIBs / Water-Jet Driven Craft | 2 | 2 | Caterpillar 3126 Diesels | 2 | None | 0 | 1-2 | 600 | 2 | NA | 0.04 | 1.59 | 0.01 | 0.17 | 0.02 | 0.64 | 25.44 | 0.16 | 2.72 | 0.32 |
| **1.4.6** | **Conduct Maritime Interception** | | | | | | | | | | | | | | | | | | | | | | | | |
| 13 | Visit, Board, Search and Seizure | | 1 | 30 | Foss Tug | 1 | 4 | Foster Wheeler/ Babcock & Wilcox | 2 | NA - No separate emissions | 0 | 7 | 25% | 2 | NA | 1.85 | 10.89 | 1.38 | 32.76 | 6.57 | 221.44713 | 1306.538 | 166.0853 | 3930.686 | 788.9054 |
| | | | 1 | 30 | RHIB | 1 | 4 | Caterpillar 3126 Diesels | 2 | None | 0 | 1-2 | 600 | 2 | NA | 0.04 | 1.59 | 0.01 | 0.17 | 0.02 | 4.8 | 190.8 | 1.2 | 20.4 | 2.4 |
| | | | 1 | 30 | Ship (DDG or CG) | 1 | 4 | GE LM 2500 | 4 | Allison 501-K34, 2,000 kW ea | 3 | 4-6 | 2.5% | 2 | 2@1300kW ea | 102.98 | 47.34 | 8.10 | 17.04 | 2.35 | 12357.6 | 5680.8 | 972 | 2044.8 | 282 |
| **1.5.4** | **Conduct Amphibious Operations** | | | | | | | | | | | | | | | | | | | | | | | | |
| 14 | Small Boat Handling | | 1 | 94 | CRRC | 4 | 6 | OMC Outboard, 55 hp (d) | 1 | None | 0 | 2 | 600-800 | 1 | NA | 8.982561 | 0.859697 | 5.148482 | 0.002183 | 1.234617 | 20264.658 | 1939.477 | 11614.98 | 4.923918 | 2785.296 |
| 15 | Swimmer Conditioning - Bay and Ocean with fins | | 1 | 189 | Personal Watercraft / CRRC / RHIB | 1 | 1 | Yamaha Outboard, 160 hp (d) | 1 | None | 0 | 2 | 100% | 1 | NA | 26.13109 | 2.500937 | 14.9774 | 0.006349 | 3.591614 | 4938.7755 | 472.6771 | 2830.729 | 1.200026 | 678.815 |
| 16 | Basic Reconnaissance Course Final Mission | | 1 | 8 | IBS | 1 | 6 | OMC Outboard, 55 hp (d) | 1 | None | 0 | 2 | 600-800 | 1 | NA | 8.982561 | 0.859697 | 5.148482 | 0.002183 | 1.234617 | 431.16294 | 41.26546 | 247.1271 | 0.104764 | 59.26162 |
| | | | 1 | 8 | LCU | 1 | 6 | GM Detroit, V12-71N 460bhp | 2 | 3-71 GM Detroit, 40 kW | 2 | 10 | 2000 rpm (97%) | 2 | 2@ 7kW ea | 36.21 | 44.95 | 0.52 | 3.11 | 1.57 | 1738.08 | 2157.6 | 24.96 | 149.28 | 75.36 |
| 17 | Obstacle Course | | 1 | 138 | None | | | | | | | | | | | | | | | | | | | | |
| 18 | Hydrographic Reconnaissance | | 1 | 40 | Personal Watercraft | 1 | 6 | Yamaha Outboard, 160 hp (d) | 1 | None | 0 | 2 | 100% | 1 | NA | 26.13109 | 2.500937 | 14.9774 | 0.006349 | 3.591614 | 6271.461 | 600.2249 | 3594.577 | 1.523843 | 861.9873 |
| | | | 1 | 40 | Small Water Craft | 8 | 6 | OMC Outboard, 55 hp (d) | 1 | None | 0 | 2 | 600-800 | 1 | NA | 8.982561 | 0.859697 | 5.148482 | 0.002183 | 1.234617 | 17246.518 | 1650.618 | 9885.086 | 4.190569 | 2370.465 |
| | | | 1 | 40 | RHIB / CRRC | 1 | 6 | Caterpillar 3126 Diesels | 2 | None | 0 | 1-2 | 600 | 2 | NA | 0.04 | 1.59 | 0.01 | 0.17 | 0.02 | 9.6 | 381.6 | 2.4 | 40.8 | 4.8 |
| | | | 1 | 40 | rigid, 10-meter craft | 1 | 6 | Caterpillar 3126 Diesels | 2 | None | 0 | 1-2 | 600 | 2 | NA | 0.04 | 1.59 | 0.01 | 0.17 | 0.02 | 9.6 | 381.6 | 2.4 | 40.8 | 4.8 |
| 19 | Surf Observations (SUROBS) | | 1 | 116 | None | | | | | | | | | | | | | | | | | | | | |
| 20 | CRRC Inflatable Boat Small (IBS)/Surf Passage/Boat Team Organ | | 1 | 72 | CRRC/Zodiac/Propeller Surface Craft/RH | 6 | 6 | OMC Outboard, 55 hp (d) | 1 | None | 0 | 2 | 600-800 | 1 | NA | 8.982561 | 0.859697 | 5.148482 | 0.002183 | 1.234617 | 23282.799 | 2228.335 | 13344.87 | 5.657268 | 3200.128 |
| | | | 1 | 72 | Personal Watercraft | 1 | 6 | Yamaha Outboard, 160 hp (d) | 1 | None | 0 | 2 | 100% | 1 | NA | 26.13109 | 2.500937 | 14.9774 | 0.006349 | 3.591614 | 11288.63 | 1080.405 | 6470.238 | 2.742918 | 1551.577 |
| 21 | CRRC Towing and High Speed Maneuver | | 1 | 8 | CRRC | 4 | 6 | OMC Outboard, 55 hp (d) | 1 | None | 0 | 2 | 600-800 | 1 | NA | 8.982561 | 0.859697 | 5.148482 | 0.002183 | 1.234617 | 1724.6518 | 165.0618 | 988.5086 | 0.419057 | 237.0465 |
| | | | 1 | 8 | Personal Watercraft | 1 | 6 | Yamaha Outboard, 160 hp (d) | 1 | None | 0 | 2 | 100% | 1 | NA | 26.13109 | 2.500937 | 14.9774 | 0.006349 | 3.591614 | 1254.2922 | 120.045 | 718.9153 | 0.304769 | 172.3975 |
| 22 | CRRC Bay Landing Craft Utility (LCU) Launch and Recover - Bay | | 1 | 24 | CRRC | 4 | 6 | OMC Outboard, 55 hp (d) | 1 | None | 0 | 2 | 600-800 | 1 | NA | 8.982561 | 0.859697 | 5.148482 | 0.002183 | 1.234617 | 5173.9553 | 495.1855 | 2965.526 | 1.257171 | 711.1395 |
| | | | 1 | 24 | Personal Watercraft | 1 | 6 | Yamaha Outboard, 160 hp (d) | 1 | None | 0 | 2 | 100% | 1 | NA | 26.13109 | 2.500937 | 14.9774 | 0.006349 | 3.591614 | 3762.8766 | 360.1349 | 2156.746 | 0.914306 | 517.1924 |
| | | | 1 | 24 | RHIB | 1 | 6 | Caterpillar 3126 Diesels | 2 | None | 0 | 1-2 | 600 | 2 | NA | 0.04 | 1.59 | 0.01 | 0.17 | 0.02 | 5.76 | 228.96 | 1.44 | 24.48 | 2.88 |

| Scenario | Type Training | Reference | Days (a) | Operations (b) | Ship/Boat Type | Number | Ship Time on Range (hrs) (e) | Engines and Generators | | | | Ave. Speed (Knots) | Power Level (%) or horsepower | Engines on Line | Generator - Load (kW) | Emissions Factors (lb/hr) (c) | | | | | Emissions, (lbs/year) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Hours | Propulsion | No. | Generator | No. | | | | | CO | NOx | ROG | SOx | PM10 | CO | Nox | ROG | Sox | PM |
| | | | 1 | 24 | LCU | 1 | 6 | GM Detroit, V12-71N 460bhp | 2 | 3-71 GM Detroit, 40 kW | 2 | 10 | 2000 rpm (97%) | 2 | 2@ 7kW ea | 36.21 | 44.95 | 0.52 | 3.11 | 1.57 | 5214.24 | 6472.8 | 74.88 | 447.84 | 226.08 |
| 23 | CRRC Navigation, Bay and Ocean Runs | | 1 | 26 | CRRC | 6 | 6 | OMC Outboard, 55 hp (d) | 1 | None | 0 | 2 | 600-800 | 1 | NA | 8.982561 | 0.859697 | 5.148482 | 0.002183 | 1.234617 | 8407.6774 | 804.6765 | 4818.979 | 2.042902 | 1155.602 |
| | | | 1 | 26 | RHIB | 1 | 6 | Caterpillar 3126 Diesels | 2 | None | 0 | 1-2 | 600 | 2 | NA | 0.04 | 1.59 | 0.01 | 0.17 | 0.02 | 6.24 | 248.04 | 1.56 | 26.52 | 3.12 |
| 24 | Amphibious Raid Course Final Mission | | 1 | 24 | LCU | 2 | 2 | GM Detroit, V12-71N 460bhp | 2 | 3-71 GM Detroit, 40 kW | 2 | 10 | 2000 rpm (97%) | 2 | 2@ 7kW ea | 36.21 | 44.95 | 0.52 | 3.11 | 1.57 | 3476.16 | 4315.2 | 49.92 | 298.56 | 150.72 |
| | | | 1 | 24 | CRRCs | 12 | 2 | OMC Outboard, 55 hp (d) | 1 | None | 0 | 2 | 600-800 | 1 | NA | 8.982561 | 0.859697 | 5.148482 | 0.002183 | 1.234617 | 5173.9553 | 495.1855 | 2965.526 | 1.257171 | 711.1395 |
| 25 | Amphibious Raid Operations | | 3 | 2 | CRRCs | 13 | 2 | OMC Outboard, 55 hp (d) | 1 | None | 0 | 2 | 600-800 | 1 | NA | 8.982561 | 0.859697 | 5.148482 | 0.002183 | 1.234617 | 467.09319 | 44.70425 | 267.7211 | 0.113495 | 64.20009 |
| | | | 3 | 2 | LPD | 1 | 2 | Foster Wheeler/ Babcock & Wilcox | 2 | NA - No separate emissions | 0 | 7 | 25% | 2 | NA | 1.85 | 10.89 | 1.38 | 32.76 | 6.57 | 7.3815708 | 43.55127 | 5.536178 | 131.0229 | 26.29685 |
| | | | 3 | 2 | LCUs | 2 | 2 | GM Detroit, V12-71N 460bhp | 2 | 3-71 GM Detroit, 40 kW | 2 | 10 | 2000 rpm (97%) | 2 | 2@ 7kW ea | 36.21 | 44.95 | 0.52 | 3.11 | 1.57 | 289.68 | 359.6 | 4.16 | 24.88 | 12.56 |
| | | | 3 | 2 | LCACs | 2 | 2 | Avco Lycoming TF-40B 3,955 hp each | 4 | APU T-62-T-40-7 Sunstrand 60 kW each | 2 | 35 | 80% | 4 | 2@ 10kW ea | 25.41 | 55.32 | 0.72 | 43.30 | 3.89 | 203.28 | 442.56 | 5.76 | 346.4 | 31.12 |
| | | | 3 | 2 | EFV | 6 | 2 | | | | | | | | | 2.0611 | 4.17 | 0.72 | 0.06 | 0.3211 | 49.4664 | 100.008 | 17.3064 | 1.5168 | 7.7064 |
| 26 | Direct Action (DA) Operations | | 3 | 2 | CRRCs | 9 | 2 | OMC Outboard, 55 hp (d) | 1 | None | 0 | 2 | 600-800 | 1 | NA | 8.982561 | 0.859697 | 5.148482 | 0.002183 | 1.234617 | 323.37221 | 30.94909 | 185.3454 | 0.078573 | 44.44622 |
| | | | 3 | 2 | LPD | 1 | 2 | Foster Wheeler/ Babcock & Wilcox | 2 | NA - No separate emissions | 0 | 7 | 25% | 2 | NA | 1.85 | 10.89 | 1.38 | 32.76 | 6.57 | 7.3815708 | 43.55127 | 5.536178 | 131.0229 | 26.29685 |
| 27 | Craft Landing Zone (CLZ) | | 1 | 4 | 1 LCAC per CLZ | 1 | 2 | Avco Lycoming TF-40B 3,955 hp each | 4 | APU T-62-T-40-7 Sunstrand 60 kW each | 2 | 35 | 80% | 4 | 2@ 10kW ea | 25.41 | 55.32 | 0.72 | 43.30 | 3.89 | 203.28 | 442.56 | 5.76 | 346.4 | 31.12 |
| **1.5.7** | **Conduct Naval Special Warfare** | | | | | | | | | | | | | | | | | | | | | | | | |
| 28 | Swimmer/Combat Rubber Raiding Craft Over-the-Beach | | 4 | 52 | RHIBs / CRRCs | 3 | 2 | Caterpillar 3126 Diesels | 2 | None | 0 | 1-2 | 600 | 2 | NA | 0.04 | 1.59 | 0.01 | 0.17 | 0.02 | 49.92 | 1984.32 | 12.48 | 212.16 | 24.96 |
| | | | 4 | 52 | Rigid, 10-meter craft | 1 | 2 | Caterpillar 3126 Diesels | 2 | None | 0 | 1-2 | 600 | 2 | NA | 0.04 | 1.59 | 0.01 | 0.17 | 0.02 | 16.64 | 661.44 | 4.16 | 70.72 | 8.32 |
| 29 | Over-the-Beach Stalk | | 1 | 16 | CRRCs | 1 | 2 | OMC Outboard, 55 hp (d) | 1 | None | 0 | 2 | 600-800 | 1 | NA | 8.982561 | 0.859697 | 5.148482 | 0.002183 | 1.234617 | 287.44196 | 27.51031 | 164.7514 | 0.069843 | 39.50775 |
| | | | 1 | 16 | Boston Whaler | 1 | 2 | OMC Johnson Outboards (d) | 2 | None | 0 | 2-3 | 1000 | 2 | NA | 8.982561 | 0.859697 | 5.148482 | 0.002183 | 1.234617 | 287.44196 | 27.51031 | 164.7514 | 0.069843 | 39.50775 |
| 30 | Immediate Action Drills | | 1 | 8 | RHIBs | 1 | 2 | Caterpillar 3126 Diesels | 2 | None | 0 | 1-2 | 600 | 2 | NA | 0.04 | 1.59 | 0.01 | 0.17 | 0.02 | 0.64 | 25.44 | 0.16 | 2.72 | 0.32 |
| | | | 1 | 8 | CRRCs | 1 | 2 | OMC Outboard, 55 hp (d) | 1 | None | 0 | 2 | 600-800 | 1 | NA | 8.982561 | 0.859697 | 5.148482 | 0.002183 | 1.234617 | 143.72098 | 13.75515 | 82.37571 | 0.034921 | 19.75387 |
| 31 | Breacher Training | | 1 | 20 | None | 0 | | | | | | | | | | | | | | | | | | | |
| 32 | Amphibious Warfare Exercise | | 1 | 50 | RHIBs | 2 | 2 | Caterpillar 3126 Diesels | 2 | None | 0 | 1-2 | 600 | 2 | NA | 0.04 | 1.59 | 0.01 | 0.17 | 0.02 | 8 | 318 | 2 | 34 | 4 |
| | | | 1 | 50 | MK V | 2 | 2 | MTU 12V 396 TE94, 12 cyl | 2 | Northern Light, M844, 4 cyl 16 kW | 1 | 5-6 | 30% | 1 | 10 kW | 1.94 | 14.83 | 0.50 | 2.39 | 0.20 | 388 | 2966 | 100 | 478 | 40 |
| 33 | Mobility Primary Mission Area | | 1 | 200 | RHIB or MK V | 4 | 2 | Caterpillar 3126 Diesels | 2 | None | 0 | 1-2 | 600 | 2 | NA | 0.04 | 1.59 | 0.01 | 0.17 | 0.02 | 64 | 2544 | 16 | 272 | 32 |
| 34 | Escape and Evasion | | 1 | 20 | RHIBs | 2 | 2 | Caterpillar 3126 Diesels | 2 | None | 0 | 1-2 | 600 | 2 | NA | 0.04 | 1.59 | 0.01 | 0.17 | 0.02 | 3.2 | 127.2 | 0.8 | 13.6 | 1.6 |
| | | | 1 | 20 | MK V | 2 | 2 | MTU 12V 396 TE94, 12 cyl | 2 | Northern Light, M844, 4 cyl 16 kW | 1 | 5-6 | 30% | 1 | 10 kW | 1.94 | 14.83 | 0.50 | 2.39 | 0.20 | 155.2 | 1186.4 | 40 | 191.2 | 16 |
| **2.2.3** | **Perform Tactical Reconnaissance and Surveillance** | | | | | | | | | | | | | | | | | | | | | | | | |
| 35 | Helicopter Rope Suspension Training/Cast & Recovery Operation | | 1 | 124 | RHIBs | 1 | 2 | Caterpillar 3126 Diesels | 2 | None | 0 | 1-2 | 600 | 2 | NA | 0.04 | 1.59 | 0.01 | 0.17 | 0.02 | 9.92 | 394.32 | 2.48 | 42.16 | 4.96 |
| | | | 1 | 124 | CRRCs | 2 | 2 | OMC Outboard, 55 hp (d) | 1 | None | 0 | 2 | 600-800 | 1 | NA | 8.982561 | 0.859697 | 5.148482 | 0.002183 | 1.234617 | 4455.3504 | 426.4098 | 2553.647 | 1.082564 | 612.3701 |
| 36 | Rappel and Fast Rope Training | | 1 | 6 | None | | | | | | | | | | | | | | | | | | | | |
| 37 | SEAL Delivery Vehicle (SDV)/Advanced Seal Delivery System (AS | | 14 | 14 | RHIBs | 2 | 2 | Caterpillar 3126 Diesels | 2 | None | 0 | 1-2 | 600 | 2 | NA | 0.04 | 1.59 | 0.01 | 0.17 | 0.02 | 31.36 | 1246.56 | 7.84 | 133.28 | 15.68 |
| **4.5.6** | **Construct, Maintain, and Operate Logistics Over-the-Shore** | | | | | | | | | | | | | | | | | | | | | | | | |
| 38 | OPDS | | 25 | 6 | OUBs | 2 | 4 | GM Detroit, V12-71N 460bhp | 2 | 3-71 GM Detroit, 40 kW | 2 | 10 | 2000 rpm (97%) | 2 | 2@ 7kW ea | 36.21 | 44.95 | 0.52 | 3.11 | 1.57 | 43452 | 53940 | 624 | 3732 | 1884 |
| 39 | Amphibious Bulk Liquid Transfer System (ABLTS) | | 10 | 4 | Warping Tug | 1 | 4 | Foster Wheeler/ Babcock & Wilcox | 2 | NA - No separate emissions | 0 | 7 | 25% | 2 | NA | 1.85 | 10.89 | 1.38 | 32.76 | 6.57 | 295.26283 | 1742.051 | 221.4471 | 5240.915 | 1051.874 |
| | | | 10 | 4 | Barge Ferry | 2 | 4 | Foster Wheeler/ Babcock & Wilcox | 2 | NA - No separate emissions | 0 | 7 | 25% | 2 | NA | 1.85 | 10.89 | 1.38 | 32.76 | 6.57 | 590.52567 | 3484.101 | 442.8943 | 10481.83 | 2103.748 |
| 40 | Barge Ferry/Causeway Coxswain Training | | 3 | 34 | Barge Ferry | 2 | 4 | Foster Wheeler/ Babcock & Wilcox | 2 | NA - No separate emissions | 0 | 7 | 25% | 2 | NA | 1.85 | 10.89 | 1.38 | 32.76 | 6.57 | 1505.8405 | 8884.459 | 1129.38 | 26728.67 | 5364.557 |
| 41 | Causeway Pier Insertion and Retraction | | 5 | 9 | WTs | 4 | 4 | Foster Wheeler/ Babcock & Wilcox | 2 | NA - No separate emissions | 0 | 7 | 25% | 2 | NA | 1.85 | 10.89 | 1.38 | 32.76 | 6.57 | 1328.6828 | 7839.228 | 996.5121 | 23584.12 | 4733.432 |
| 42 | Elevated Causeway System (ELCAS) | | 10 | 2 | WTs | 2 | 4 | Foster Wheeler/ Babcock & Wilcox | 2 | NA - No separate emissions | 0 | 7 | 25% | 2 | NA | 1.85 | 10.89 | 1.38 | 32.76 | 6.57 | 295.26283 | 1742.051 | 221.4471 | 5240.915 | 1051.874 |
| | | | 10 | 2 | Personal Watercraft | 2 | 4 | Yamaha Outboard, 160 hp (d) | 1 | None | 0 | 2 | 100% | 1 | NA | 26.13109 | 2.500937 | 14.9774 | 0.006349 | 3.591614 | 4180.974 | 400.1499 | 2396.384 | 1.015895 | 574.6582 |

| Scenario | Type Training | Reference | Days (a) | Operations (b) | Ship/Boat Type | Number | Ship Time on Range (hrs) (e) | Engines and Generators | | | | Ave. Speed (Knots) | Power Level (%) or horsepower | Engines on Line | Generator - Load (kW) | Emissions Factors (lb/hr) (c) | | | | | Emissions, (lbs/year) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Hours | Propulsion | No. | Generator | No. | | | | | CO | NOx | ROG | SOx | PM10 | CO | Nox | ROG | Sox | PM |
| | | | 10 | 2 | LCM | 1 | 4 | GM Detroit, V12-71N 460bhp | 2 | 3-71 GM Detroit, 40 kW | 2 | 10 | 2000 rpm (97%) | 2 | 2@ 7kW ea | 36.21 | 44.95 | 0.52 | 3.11 | 1.57 | 2896.8 | 3596 | 41.6 | 248.8 | 125.6 |
| 43 | Establish Beach Party Command Post | | 4 | 16 | None | | | | | | | | | | | | | | | | | | | | |
| 44 | Sterngate Marriage to Amphibious Ship/LCU | | 1 | 40 | LCU | 2 | 4 | GM Detroit, V12-71N 460bhp | 2 | 3-71 GM Detroit, 40 kW | 2 | 10 | 2000 rpm (97%) | 2 | 2@ 7kW ea | 36.21 | 44.95 | 0.52 | 3.11 | 1.57 | 11587.2 | 14384 | 166.4 | 995.2 | 502.4 |
| 45 | LCU/LCM Beaching | | 1 | 60 | LCU | 1 | 4 | GM Detroit, V12-71N 460bhp | 2 | 3-71 GM Detroit, 40 kW | 2 | 10 | 2000 rpm (97%) | 2 | 2@ 7kW ea | 36.21 | 44.95 | 0.52 | 3.11 | 1.57 | 8690.4 | 10788 | 124.8 | 746.4 | 376.8 |
| | | | 1 | 60 | LCM-8 | 1 | 4 | GM Detroit, V12-71N 460bhp | 2 | 3-71 GM Detroit, 40 kW | 2 | 10 | 2000 rpm (97%) | 2 | 2@ 7kW ea | 36.21 | 44.95 | 0.52 | 3.11 | 1.57 | 8690.4 | 10788 | 124.8 | 746.4 | 376.8 |
| 46 | LCU/LCM Towing/Being Towed | | 1 | 60 | LCU | 2 | 4 | GM Detroit, V12-71N 460bhp | 2 | 3-71 GM Detroit, 40 kW | 2 | 10 | 2000 rpm (97%) | 2 | 2@ 7kW ea | 36.21 | 44.95 | 0.52 | 3.11 | 1.57 | 17380.8 | 21576 | 249.6 | 1492.8 | 753.6 |
| | | | 1 | 60 | LCM-8 | 2 | 4 | GM Detroit, V12-71N 460bhp | 2 | 3-71 GM Detroit, 40 kW | 2 | 10 | 2000 rpm (97%) | 2 | 2@ 7kW ea | 36.21 | 44.95 | 0.52 | 3.11 | 1.57 | 17380.8 | 21576 | 249.6 | 1492.8 | 753.6 |
| 47 | Communications Training | | 2 | 1 | None | | | | | | | | | | | | | | | | | | | | |
| 48 | Field Training Exercise with a Beach Camp | | 14 | 1 | None | | | | | | | | | | | | | | | | | | | | |
| 49 | Maritime Pre-positioning Ships (MPS) Offload | | 5 | 1 | LCM-8 | 2 | 2 | GM Detroit, V12-71N 460bhp | 2 | 3-71 GM Detroit, 40 kW | 2 | 10 | 2000 rpm (97%) | 2 | 2@ 7kW ea | 36.21 | 44.95 | 0.52 | 3.11 | 1.57 | 724.2 | 899 | 10.4 | 62.2 | 31.4 |
| | | | 5 | 1 | WTs | 2 | 2 | Foster Wheeler/ Babcock & Wilcox | 2 | NA - No separate emissions | 0 | 7 | 25% | 2 | NA | 1.85 | 10.89 | 1.38 | 32.76 | 6.57 | 36.907854 | 217.7563 | 27.68089 | 655.1144 | 131.4842 |
| | | | 5 | 1 | Barge Ferry | 2 | 2 | Foster Wheeler/ Babcock & Wilcox | 2 | NA - No separate emissions | 0 | 7 | 25% | 2 | NA | 1.85 | 10.89 | 1.38 | 32.76 | 6.57 | 36.907854 | 217.7563 | 27.68089 | 655.1144 | 131.4842 |
| 50 | Reverse Osmosis Water Purification Unit | | 4 | 4 | None | | | | | | | | | | | | | | | | | | | | |
| 51 | Roll-on/Roll-off Discharge Facility | | 5 | 1 | WTs | 2 | 2 | Foster Wheeler/ Babcock & Wilcox | 2 | NA - No separate emissions | 0 | 7 | 25% | 2 | NA | 1.85 | 10.89 | 1.38 | 32.76 | 6.57 | 36.907854 | 217.7563 | 27.68089 | 655.1144 | 131.4842 |
| | | | 5 | 1 | Personal Watercraft | 2 | 2 | Yamaha Outboard, 160 hp (d) | 1 | None | 0 | 2 | 100% | 1 | NA | 26.13109 | 2.500937 | 14.9774 | 0.006349 | 3.591614 | 522.62175 | 50.01874 | 299.5481 | 0.126987 | 71.83227 |
| 52 | MPF Utility Boat Operator Course | | 9 | 2 | MPF Utility Boat | 2 | 4 | Diesel Engines | 2 | None | 0 | 2 | 660 | 2 | NA | 20.46 | 4.4088 | 1.659306 | 1.353 | 1.452 | 2946.24 | 634.8672 | 238.9401 | 194.832 | 209.088 |
| 53 | LARC V Operator Training | | 6 | 1 | None | | | | | | | | | | | | | | | | | | | | |
| **4.9.1** | **Conduct Mission Area Training** | | | | | | | | | | | | | | | | | | | | | | | | |
| | **NSW Diving and Beach Operations** | | | | | | | | | | | | | | | | | | | | | | | | |
| 54 | Lung Automatic Rebreather (LAR) V Closed Circuit Breathing Divir | | 1 | 126 | RHIBs | 5 | 2 | Caterpillar 3126 Diesels | 2 | None | 0 | 1-2 | 600 | 2 | NA | 0.04 | 1.59 | 0.01 | 0.17 | 0.02 | 50.4 | 2003.4 | 12.6 | 214.2 | 25.2 |
| 55 | Open Circuit Breathing Diving | | 1 | 12 | RHIBs | 5 | 2 | Caterpillar 3126 Diesels | 2 | None | 0 | 1-2 | 600 | 2 | NA | 0.04 | 1.59 | 0.01 | 0.17 | 0.02 | 4.8 | 190.8 | 1.2 | 20.4 | 2.4 |
| | | | | | LCU | 1 | | | | | | | | | | | | | | | | | | | |
| 56 | OTB Field Training Exercise | | 5 | 36 | CRRCs | 5 | 2 | assume paddling | | | | | | | | | | | | | | | | | |
| 57 | Rock Portage | | 1 | 18 | CRRCs | 7 | 2 | assume paddling | | | | | | | | | | | | | | | | | |
| | | | 1 | 18 | IBS | 9 | 2 | OMC Outboard, 55 hp (d) | 1 | None | 0 | 2 | 600-800 | 1 | NA | 8.982561 | 0.859697 | 5.148482 | 0.002183 | 1.234617 | 2910.3499 | 278.5419 | 1668.108 | 0.707158 | 400.016 |
| | **NSW Land Warfare** | | | | | | | | | | | | | | | | | | | | | | | | |
| 58 | Land Patrolling | | 1 | 18 | None | | | | | | | | | | | | | | | | | | | | |
| 59 | Immediate Action Drills | | 1 | 5 | None | | | | | | | | | | | | | | | | | | | | |
| | **NSW Advanced Training** | | | | | | | | | | | | | | | | | | | | | | | | |
| 60 | Over the Beach Insertion / Photo Reconnaissance | | 1 | 31 | RHIB/CRRC | 1 | 2 | Caterpillar 3126 Diesels | 2 | None | 0 | 1-2 | 600 | 2 | NA | 0.04 | 1.59 | 0.01 | 0.17 | 0.02 | 2.48 | 98.58 | 0.62 | 10.54 | 1.24 |
| | | | 1 | 31 | Kayak | 1 | 2 | assume paddling | | | | | | | | | | | | | | | | | |
| 61 | Photo Image Capture | | 14 | 3 | None | | | | | | | | | | | | | | | | | | | | |
| 62 | Field Skills (Observation Drill, Sketching, Range Estimation) | | 1 | 22 | None | | | | | | | | | | | | | | | | | | | | |
| 63 | Stalking, Movement and Hide-Sites | | 5 | 8 | None | | | | | | | | | | | | | | | | | | | | |
| 64 | CQC/CQD | | 1 | 109 | CRRCs | 5 | 2 | OMC Outboard, 55 hp (d) | 1 | None | 0 | 2 | 600-800 | 1 | NA | 8.982561 | 0.859697 | 5.148482 | 0.002183 | 1.234617 | 9790.9919 | 937.0698 | 5611.845 | 2.379021 | 1345.733 |
| 65 | Communications | | 5 | 6 | None | | | | | | | | | | | | | | | | | | | | |
| 66 | Unmanned Aerial Vehicle (UAV) Training | | 5 | 12 | None | | | | | | | | | | | | | | | | | | | | |
| 67 | Around the World Training | | 1 | 6 | CRRCs | 7 | 2 | assume paddling | | | | | | | | | | | | | | | | | |
| | | | 1 | 6 | Sea Kayaks | 5 | 2 | assume paddling | | | | | | | | | | | | | | | | | |
| **4.9.4** | **Provide/Execute Training for U.S. and Other Nation Units and** | | | | | | | | | | | | | | | | | | | | | | | | |
| | **NSW Physical Fitness Training** | | | | | | | | | | | | | | | | | | | | | | | | |
| 68 | Physical Training Runs | | 1 | 464 | None | | | | | | | | | | | | | | | | | | | | |
| 69 | Physical Conditioning Training Exercise | | 1 | 280 | CRRCs / Propeller Surface Craft | 3 | 2 | assume paddling | | | | | | | | | | | | | | | | | |
| 70 | Swim Training | | 1 | 170 | RHIBs | 5 | 2 | assume paddling | | | | | | | | | | | | | | | | | |
| 71 | Hell Week | | 5 | 6 | CRRCs | 5 | 2 | OMC Outboard, 55 hp (d) | 1 | None | 0 | 2 | 600-800 | 1 | NA | 8.982561 | 0.859697 | 5.148482 | 0.002183 | 1.234617 | 2694.7684 | 257.9091 | 1544.545 | 0.654776 | 370.3851 |
| 72 | Rucksack March | | 1 | 54 | None | | | | | | | | | | | | | | | | | | | | |
| 73 | Monster Mash | | 1 | 6 | CRRCs | 3 | 2 | OMC Outboard, 55 hp (d) | 1 | None | 0 | 2 | 600-800 | 1 | NA | 8.982561 | 0.859697 | 5.148482 | 0.002183 | 1.234617 | 323.37221 | 30.94909 | 185.3454 | 0.078573 | 44.44622 |
| **4.12.6** | **Provide Industrial and Environmental Health Services** | | | | | | | | | | | | | | | | | | | | | | | | |
| 74 | Conduct Environmental Health Site Assessment | | 3 | 3 | None | | | | | | | | | | | | | | | | | | | | |
| **6.1.1** | **Conduct Explosive Ordnance Disposal** | | | | | | | | | | | | | | | | | | | | | | | | |
| 75 | Conventional Ordnance/Improvised Explosive Device Response | | 1 | 64 | None | | | | | | | | | | | | | | | | | | | | |
| 76 | Land Mine Detection/Neutralization | | 1 | 24 | None | | | | | | | | | | | | | | | | | | | | |

Table C-3
Marine Vessel Emissions
No Action Alternative

| Scenario | Type Training | Reference | Days (a) | Operations (b) | Ship/Boat Type | Number | Ship Time on Range (hrs) (e) | Engines and Generators | | | | Ave. Speed (Knots) | Power Level (%) or horsepower | Engines on Line | Generator - Load (kW) | Emissions Factors (lb/hr) (c) | | | | | Emissions, (lbs/year) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Hours | Propulsion | No. | Generator | No. | | | | | CO | NOx | ROG | SOx | PM10 | CO | Nox | ROG | Sox | PM |
| 6.3.1 | **Force Protection: Protect and Secure Area of Operations** | | | | | | | | | | | | | | | | | | | | | | | | |
| 77 | Field Training Exercise (FTX) e.g. SEAHAWK | | 14 | 53 | Boston Whalers | 144 | 2 | OMC Johnson Outboards (d) | 2 | None | 0 | 2-3 | 1000 | 2 | NA | 8.982561 | 0.859697 | 5.148482 | 0.002183 | 1.234617 | 2586.9777 | 247.5928 | 1482.763 | 0.628585 | 355.5697 |
| 6.3.3 | **Combat Terrorism** | | | | | | | | | | | | | | | | | | | | | | | | |
| 78 | Small Boat Attack | | 1 | 30 | Boston Whalers | 1 | 2 | OMC Johnson Outboards (d) | 2 | None | 0 | 2-3 | 1000 | 2 | NA | 8.982561 | 0.859697 | 5.148482 | 0.002183 | 1.234617 | 538.95368 | 51.58182 | 308.9089 | 0.130955 | 74.07703 |
| | | | 1 | 30 | surface vessel dropping anchor and 3 sh | 1 | 2 | | | | | | | | | | | | | | | | | | |
| | | | 1 | 30 | 18' Bayliner | 1 | 2 | OMC Johnson Outboards (d) | 2 | None | 0 | 2-3 | 1000 | 2 | NA | 8.982561 | 0.859697 | 5.148482 | 0.002183 | 1.234617 | 538.95368 | 51.58182 | 308.9089 | 0.130955 | 74.07703 |
| | | | | | | | | | | | | | | | | | | **lbs/year** | | | **340194.947** | **249537.92** | **91649.466** | **107049.94** | **43073.474** |
| | | | | | | | | | | | | | | | | | | **tons/year** | | | **170.10** | **124.77** | **45.82** | **53.52** | **21.54** |

Assume marine vessels participate for one day during Amphibious Raid Operations and Direct Action Operations and Seahawk
Assumptions: Watercraft operates 8 hours per day for the days during which the operation occurs

| Scenario | Type Training | Reference | Days (a) | Operations (b) | Ground Vehicles | Number | Engine Load | Hours per day | Horsepower | Emissions Factors (lb/hr) CO | NOx | ROG | SOx | PM10 | Emissions (lbs) CO | Nox | ROG | Sox | PM |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **1.1.2** | **Conduct Maneuver - Move Forces** | | | | | | | | | | | | | | | | | | |
| 1 | Anchoring | | 1 | 72 | None | | | | | | | | | | | | | | |
| 2 | Towing | | 1 | 30 | None | | | | | | | | | | | | | | |
| 3 | Moor to Buoy | | 1 | 36 | None | | | | | | | | | | | | | | |
| **1.3.1** | **Perform Mine Countermeasures** | | | | | | | | | | | | | | | | | | |
| 4 | Parachute Operations | | 1 | 216 | 4WD Pickups | 2 | | 2 | | 0.20 | 0.02 | 0.01 | 0.00 | 0.00 | 174.53 | 14.60 | 10.45 | 0.20 | 0.89 |
| 5 | MCM Operations | | 1 | 32 | 4WD Pickups | 2 | | 2 | | 0.20 | 0.02 | 0.01 | 0.00 | 0.00 | 25.86 | 2.16 | 1.55 | 0.03 | 0.13 |
| 6 | Floating Mine Operations | | 1 | 25 | 4WD Pickups | 1 | | 2 | | 0.20 | 0.02 | 0.01 | 0.00 | 0.00 | 10.10 | 0.85 | 0.61 | 0.01 | 0.05 |
| 7 | Dive Platoon | | 1 | 8 | None | | | | | | | | | | | | | | |
| 8 | Very Shallow Water (VSW) Operator Course | | 8 | 4 | None | | | | | | | | | | | | | | |
| 9 | VSW Mine Countermeasure Operations | | 1 | 120 | None | | | | | | | | | | | | | | |
| 10 | Autonomous Underwater Vehicle (AUV) Operations/UUV Operatio | | 1 | 120 | None | | | | | | | | | | | | | | |
| 11 | MK8 Marine Mammal/MMS Operations | | 1 | 175 | 4WD Pickups | 0 | | 2 | | 0.20 | 0.02 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 12 | Mine Neutralization | | 1 | 4 | 4WD Pickups | 2 | | 2 | | 0.20 | 0.02 | 0.01 | 0.00 | 0.00 | 3.23 | 0.27 | 0.19 | 0.00 | 0.02 |
| **1.4.6** | **Conduct Maritime Interception** | | | | | | | | | | | | | | | | | | |
| 13 | Visit, Board, Search and Seizure | | 1 | 30 | None | | | | | | | | | | | | | | |
| **1.5.4** | **Conduct Amphibious Operations** | | | | | | | | | | | | | | | | | | |
| 14 | Small Boat Handling | | 1 | 94 | HMMWV | 1 | 65% | 3 | | 0.18 | 2.06 | 0.60 | 0.19 | 0.17 | 33.88 | 378.24 | 110.32 | 35.07 | 31.52 |
| 15 | Swimmer Conditioning - Bay and Ocean with fins | | 1 | 189 | HMMWV | 1 | 65% | 3 | | 0.18 | 2.06 | 0.60 | 0.19 | 0.17 | 68.13 | 760.51 | 221.82 | 70.51 | 63.38 |
| | | | 1 | 189 | Truck | 1 | 80% | 1 | | 0.25 | 0.30 | 0.02 | 0.00 | 0.01 | 37.08 | 45.03 | 3.20 | 0.07 | 2.16 |
| 16 | Basic Reconnaissance Course Final Mission | | 1 | 8 | None | | | | | | | | | | | | | | |
| 17 | Obstacle Course | | 1 | 138 | 4WD Pickups | 2 | | 2 | | 0.20 | 0.02 | 0.01 | 0.00 | 0.00 | 111.50 | 9.33 | 6.68 | 0.13 | 0.57 |
| 18 | Hydrographic Reconnaissance | | 1 | 40 | 4WD Pickups | 3 | | 2 | | 0.20 | 0.02 | 0.01 | 0.00 | 0.00 | 48.48 | 4.06 | 2.90 | 0.06 | 0.25 |
| 19 | Surf Observations (SUROBS) | | 1 | 116 | 4WD Pickups | 2 | | 2 | | 0.20 | 0.02 | 0.01 | 0.00 | 0.00 | 93.73 | 7.84 | 5.61 | 0.11 | 0.48 |
| 20 | CRRC Inflatable Boat Small (IBS)/Surf Passage/Boat Team Organ | | 1 | 72 | HMMWV/ 4WD F | 2 | 65% | 3 | | 0.18 | 2.06 | 0.60 | 0.19 | 0.17 | 51.91 | 579.44 | 169.00 | 53.72 | 48.29 |
| 21 | CRRC Towing and High Speed Maneuver | | 1 | 8 | 4WD Pickups / H | 1 | | 2 | | 0.20 | 0.02 | 0.01 | 0.00 | 0.00 | 3.23 | 0.27 | 0.19 | 0.00 | 0.02 |
| 22 | CRRC Bay Landing Craft Utility (LCU) Launch and Recover - Bay a | | 1 | 24 | 4WD Pickups / H | 1 | | 2 | | 0.20 | 0.02 | 0.01 | 0.00 | 0.00 | 9.70 | 0.81 | 0.58 | 0.01 | 0.05 |
| 23 | CRRC Navigation, Bay and Ocean Runs | | 1 | 26 | 4WD Pickups / H | 1 | | 8 | | 0.20 | 0.02 | 0.01 | 0.00 | 0.00 | 42.02 | 3.52 | 2.52 | 0.05 | 0.21 |
| 24 | Amphibious Raid Course Final Mission | | 1 | 24 | None | 0 | | | | | | | | | | | | | |
| 25 | Amphibious Raid Operations | | 3 | 2 | HMMWVs | 6 | 65% | 3 | | 0.18 | 2.06 | 0.60 | 0.19 | 0.17 | 12.98 | 144.86 | 42.25 | 13.43 | 12.07 |
| | | | 3 | 2 | 4WD Pickups | 8 | | 8 | | 0.20 | 0.02 | 0.01 | 0.00 | 0.00 | 77.57 | 6.49 | 4.65 | 0.09 | 0.39 |
| | | | 3 | 2 | AAVs | 6 | | 2 | | 0.444918 | 1.0 | 0.2 | 0.1 | 0.2 | 32.03 | 74.60 | 12.53 | 3.71 | 12.90 |
| | | | 3 | 2 | LAVs | 6 | 65% | 2 | | 0.04 | 0.06 | 0.01 | 0.00 | 0.01 | 2.07 | 3.03 | 0.40 | 0.01 | 0.28 |
| | | | 3 | 2 | IFAVs | 6 | 65% | 2 | | 0.04 | 0.06 | 0.01 | 0.00 | 0.01 | 2.07 | 3.03 | 0.40 | 0.01 | 0.28 |
| 26 | Direct Action (DA) Operations | | 3 | 2 | Light Wheeled V | 16 | | 2 | | 0.20 | 0.02 | 0.01 | 0.00 | 0.00 | 38.78 | 3.24 | 2.32 | 0.04 | 0.20 |
| 27 | Craft Landing Zone (CLZ) | | 1 | 4 | HMMWVs | 1 | 65% | 3 | | 0.18 | 2.06 | 0.60 | 0.19 | 0.17 | 1.44 | 16.10 | 4.69 | 1.49 | 1.34 |
| **1.5.7** | **Conduct Naval Special Warfare** | | | | | | | | | | | | | | | | | | |
| 28 | Swimmer/Combat Rubber Raiding Craft Over-the-Beach | | 4 | 52 | 4WD Pickups | 3 | | 2 | | 0.20 | 0.02 | 0.01 | 0.00 | 0.00 | 252.10 | 21.09 | 15.10 | 0.29 | 1.28 |
| 29 | Over-the-Beach Stalk | | 1 | 16 | 4WD Pickups | 1 | | 2 | | 0.20 | 0.02 | 0.01 | 0.00 | 0.00 | 6.46 | 0.54 | 0.39 | 0.01 | 0.03 |
| 30 | Immediate Action Drills | | 1 | 8 | 4WD Pickups | 4 | | 2 | | 0.20 | 0.02 | 0.01 | 0.00 | 0.00 | 12.93 | 1.08 | 0.77 | 0.01 | 0.07 |
| 31 | Breacher Training | | 1 | 20 | 4WD Pickups | 3 | | 2 | | 0.20 | 0.02 | 0.01 | 0.00 | 0.00 | 24.24 | 2.03 | 1.45 | 0.03 | 0.12 |
| 32 | Amphibious Warfare Exercise | | 1 | 50 | None | 0 | | | | | | | | | | | | | |
| 33 | Mobility Primary Mission Area | | 1 | 200 | None | 0 | | | | | | | | | | | | | |
| 34 | Escape and Evasion | | 1 | 20 | None | 0 | | | | | | | | | | | | | |
| **2.2.3** | **Perform Tactical Reconnaissance and Surveillance** | | | | | | | | | | | | | | | | | | |
| 35 | Helicopter Rope Suspension Training/Cast & Recovery Operation | | 1 | 124 | 4WD Pickups | 2 | | 2 | | 0.20 | 0.02 | 0.01 | 0.00 | 0.00 | 100.19 | 8.38 | 6.00 | 0.11 | 0.51 |
| 36 | Rappel and Fast Rope Training | | 1 | 6 | 4WD Pickups | 4 | | 2 | | 0.20 | 0.02 | 0.01 | 0.00 | 0.00 | 9.70 | 0.81 | 0.58 | 0.01 | 0.05 |

Table C-4
Ground Vehicle Emissions
No Action Alternative

| Scenario | Type Training | Reference | Days (a) | Operations (b) | Ground Vehicles | Number | Engine Load | Hours per day | Horsepower | Emissions Factors (lb/hr) CO | NOx | ROG | SOx | PM10 | Emissions (lbs) CO | Nox | ROG | Sox | PM |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 37 | SEAL Delivery Vehicle (SDV)/Advanced Seal Delivery System (AS | | 14 | 14 | 4WD Pickups | 2 | | 2 | | 0.20 | 0.02 | 0.01 | 0.00 | 0.00 | 158.37 | 13.25 | 9.49 | 0.18 | 0.80 |
| **4.5.6** | **Construct, Maintain, and Operate Logistics Over-the-Shore** | | | | | | | | | | | | | | | | | | |
| 38 | OPDS | | 25 | 6 | HMMWVs | 1 | 65% | 3 | | 0.18 | 2.06 | 0.60 | 0.19 | 0.17 | 54.07 | 603.58 | 176.04 | 55.96 | 50.30 |
| | | | 25 | 6 | 5-ton truck | 1 | 80% | 1 | | 0.25 | 0.30 | 0.02 | 0.00 | 0.01 | 29.43 | 35.74 | 2.54 | 0.06 | 1.72 |
| | | | 25 | 6 | Dozer | 2 | 59% | 8 | 240.0 | 0.01 | 0.02 | 0.00 | 0.00 | 0.00 | 1955.47 | 6211.06 | 696.78 | 4.50 | 368.62 |
| | | | 25 | 6 | Comm Van | 1 | | 8 | | 0.20 | 0.02 | 0.01 | 0.00 | 0.00 | 242.40 | 20.28 | 14.52 | 0.28 | 1.23 |
| | | | 25 | 6 | RTV forklift | 1 | 48% | 8 | 93.0 | 0.01 | 0.02 | 0.00 | 0.00 | 0.00 | 483.83 | 882.35 | 149.59 | 0.82 | 80.64 |
| | | | 25 | 6 | LARCV | 2 | | 2 | 350.0 | 10.85 | 2.338 | 0.879935 | 0.7175 | 0.77 | 6510.00 | 1402.80 | 527.96 | 430.50 | 462.00 |
| 39 | Amphibious Bulk Liquid Transfer System (ABLTS) | | 10 | 4 | HMMWVs | 1 | 65% | 3 | | 0.18 | 2.06 | 0.60 | 0.19 | 0.17 | 14.42 | 160.96 | 46.95 | 14.92 | 13.41 |
| | | | 10 | 4 | 5-ton truck | 1 | 80% | 1 | | 0.25 | 0.30 | 0.02 | 0.00 | 0.01 | 7.85 | 9.53 | 0.68 | 0.01 | 0.46 |
| | | | 10 | 4 | Van | 1 | | 8 | | 0.20 | 0.02 | 0.01 | 0.00 | 0.00 | 64.64 | 5.41 | 3.87 | 0.07 | 0.33 |
| | | | 10 | 4 | Dozers | 2 | 59% | 8 | 240.0 | 0.01 | 0.02 | 0.00 | 0.00 | 0.00 | 521.46 | 1656.28 | 185.81 | 1.20 | 98.30 |
| | | | 10 | 4 | Rough Terrain F | 1 | 48% | 8 | 37.0 | 0.01 | 0.02 | 0.00 | 0.00 | 0.00 | 51.87 | 94.60 | 16.04 | 0.09 | 8.65 |
| | | | 10 | 4 | LARCV | 2 | | 2 | 350.0 | 10.85 | 2.338 | 0.879935 | 0.7175 | 0.77 | 1736.00 | 374.08 | 140.79 | 114.80 | 123.20 |
| 40 | Barge Ferry/Causeway Coxswain Training | | 3 | 34 | HMMWVs | 1 | 65% | 3 | | 0.18 | 2.06 | 0.60 | 0.19 | 0.17 | 36.77 | 410.44 | 119.71 | 38.05 | 34.20 |
| | | | 3 | 34 | 5-ton truck | 1 | 80% | 1 | | 0.25 | 0.30 | 0.02 | 0.00 | 0.01 | 20.01 | 24.30 | 1.72 | 0.04 | 1.17 |
| | | | 3 | 34 | Van | 1 | | 8 | | 0.20 | 0.02 | 0.01 | 0.00 | 0.00 | 164.83 | 13.79 | 9.87 | 0.19 | 0.84 |
| | | | 3 | 34 | Dozer | 2 | 59% | 8 | 240.0 | 0.01 | 0.02 | 0.00 | 0.00 | 0.00 | 1329.72 | 4223.52 | 473.81 | 3.06 | 250.66 |
| | | | 3 | 34 | LARCV | 2 | | 2 | 350.0 | 10.85 | 2.338 | 0.879935 | 0.7175 | 0.77 | 4426.80 | 953.90 | 359.01 | 292.74 | 314.16 |
| 41 | Causeway Pier Insertion and Retraction | | 5 | 9 | HMMWVs | 2 | 65% | 3 | | 0.18 | 2.06 | 0.60 | 0.19 | 0.17 | 32.44 | 362.15 | 105.63 | 33.57 | 30.18 |
| | | | 5 | 9 | 5-ton truck | 1 | 80% | 1 | | 0.25 | 0.30 | 0.02 | 0.00 | 0.01 | 8.83 | 10.72 | 0.76 | 0.02 | 0.51 |
| | | | 5 | 9 | Van | 1 | | 8 | | 0.20 | 0.02 | 0.01 | 0.00 | 0.00 | 72.72 | 6.08 | 4.36 | 0.08 | 0.37 |
| | | | 5 | 9 | Rough Terrain F | 1 | 48% | 8 | 37.0 | 0.01 | 0.02 | 0.00 | 0.00 | 0.00 | 58.36 | 106.42 | 18.04 | 0.10 | 9.73 |
| | | | 5 | 9 | Dozers | 2 | 59% | 8 | 240.0 | 0.01 | 0.02 | 0.00 | 0.00 | 0.00 | 586.64 | 1863.32 | 209.03 | 1.35 | 110.59 |
| | | | 5 | 9 | LARCV | 2 | | 2 | 350.0 | 10.85 | 2.338 | 0.879935 | 0.7175 | 0.77 | 1953.00 | 420.84 | 158.39 | 129.15 | 138.60 |
| 42 | Elevated Causeway System (ELCAS) | | 10 | 2 | HMMWVs | 4 | 65% | 3 | | 0.18 | 2.06 | 0.60 | 0.19 | 0.17 | 28.84 | 321.91 | 93.89 | 29.84 | 26.83 |
| | | | 10 | 2 | 5-ton truck | 3 | 80% | 1 | | 0.25 | 0.30 | 0.02 | 0.00 | 0.01 | 11.77 | 14.29 | 1.01 | 0.02 | 0.69 |
| | | | 10 | 2 | Light Trucks | 4 | 62% | 8 | 161.0 | 0.01 | 0.02 | 0.00 | 0.00 | 0.00 | 491.54 | 971.81 | 139.43 | 127.77 | 97.18 |
| | | | 10 | 2 | Dozers | 2 | 59% | 8 | 240.0 | 0.01 | 0.02 | 0.00 | 0.00 | 0.00 | 260.73 | 828.14 | 92.90 | 0.60 | 49.15 |
| | | | 10 | 2 | Forklifts | 1 | 48% | 8 | 37.0 | 0.01 | 0.02 | 0.00 | 0.00 | 0.00 | 25.94 | 47.30 | 8.02 | 0.04 | 4.32 |
| | | | 10 | 2 | 75-Ton Crane | 2 | 74% | 8 | 194.0 | 0.00 | 0.02 | 0.00 | 0.00 | 0.00 | 198.51 | 711.99 | 70.90 | 0.61 | 27.35 |
| | | | 10 | 2 | Pile Driver | 2 | 30% | 24 | 20.0 | 0.01 | 0.01 | 0.00 | 0.00 | 0.00 | 34.29 | 52.06 | 18.41 | 11.52 | 7.62 |
| | | | 10 | 2 | ambulance | 1 | | 8 | | 0.20 | 0.02 | 0.01 | 0.00 | 0.00 | 32.32 | 2.70 | 1.94 | 0.04 | 0.16 |
| | | | 10 | 2 | water buffalo | 1 | 80% | 1 | | 0.25 | 0.30 | 0.02 | 0.00 | 0.01 | 3.92 | 4.76 | 0.34 | 0.01 | 0.23 |
| | | | 10 | 2 | 140-ton crane | 1 | 74% | 8 | 399.0 | 0.00 | 0.02 | 0.00 | 0.00 | 0.00 | 204.13 | 732.18 | 72.91 | 0.62 | 28.12 |
| | | | 10 | 2 | 30-ton crane | 2 | 74% | 8 | 194.0 | 0.00 | 0.02 | 0.00 | 0.00 | 0.00 | 198.51 | 711.99 | 70.90 | 0.61 | 27.35 |
| | | | 10 | 2 | LARCV | 2 | | 2 | 350.0 | 10.85 | 2.338 | 0.879935 | 0.7175 | 0.77 | 868.00 | 187.04 | 70.39 | 57.40 | 61.60 |
| | | | 10 | 2 | Air compressors | 2 | 48% | 8 | 106.0 | 0.01 | 0.02 | 0.00 | 0.00 | 0.00 | 146.45 | 278.54 | 47.38 | 0.25 | 24.62 |
| | | | 10 | 2 | Pile Extractor | 1 | 30% | 24 | 20.0 | 0.01 | 0.01 | 0.00 | 0.00 | 0.00 | 17.14 | 26.03 | 9.21 | 5.76 | 3.81 |
| 43 | Establish Beach Party Command Post | | 4 | 16 | HMMWVs | 3 | 65% | 3 | | 0.18 | 2.06 | 0.60 | 0.19 | 0.17 | 69.21 | 772.58 | 225.34 | 71.63 | 64.38 |
| | | | 4 | 16 | 5-ton truck | 1 | 80% | 1 | | 0.25 | 0.30 | 0.02 | 0.00 | 0.01 | 12.55 | 15.25 | 1.08 | 0.02 | 0.73 |
| | | | 4 | 16 | Dozer | 1 | 59% | 8 | 240.0 | 0.01 | 0.02 | 0.00 | 0.00 | 0.00 | 417.17 | 1325.03 | 148.65 | 0.96 | 78.64 |
| | | | 4 | 16 | Generators/vario | 2 | 30% | 24 | Various | 11.98 | 55.59 | 4.52 | 3.67 | 3.93 | 5519.25 | 25617.23 | 2084.62 | 1689.14 | 1809.07 |
| | | | 4 | 16 | Heaters | 2 | 51% | 8 | 238.0 | 0.00 | 0.02 | 0.00 | 0.00 | 0.00 | 463.10 | 1866.08 | 172.63 | 1.64 | 64.67 |
| | | | 4 | 16 | LARCV | 2 | | 2 | 350.0 | 10.85 | 2.338 | 0.879935 | 0.7175 | 0.77 | 2777.60 | 598.53 | 225.26 | 183.68 | 197.12 |
| 44 | Sterngate Marriage to Amphibious Ship/LCU | | 1 | 40 | None | 0 | | | | | | | | | | | | | |
| 45 | LCU/LCM Beaching | | 1 | 60 | HMMWVs | 1 | 65% | 3 | | 0.18 | 2.06 | 0.60 | 0.19 | 0.17 | 21.63 | 241.43 | 70.42 | 22.38 | 20.12 |
| | | | 1 | 60 | 5-ton truck | 1 | 80% | 1 | | 0.25 | 0.30 | 0.02 | 0.00 | 0.01 | 11.77 | 14.29 | 1.01 | 0.02 | 0.69 |
| | | | 1 | 60 | Dozer | 1 | 59% | 8 | 240.0 | 0.01 | 0.02 | 0.00 | 0.00 | 0.00 | 391.09 | 1242.21 | 139.36 | 0.90 | 73.72 |
| | | | 1 | 60 | LARCV | 1 | | 2 | 350.0 | 10.85 | 2.338 | 0.879935 | 0.7175 | 0.77 | 1302.00 | 280.56 | 105.59 | 86.10 | 92.40 |
| 46 | LCU/LCM Towing/Being Towed | | 1 | 60 | Dozer | 1 | 59% | 8 | 240.0 | 0.01 | 0.02 | 0.00 | 0.00 | 0.00 | 391.09 | 1242.21 | 139.36 | 0.90 | 73.72 |

Table C-4
Ground Vehicle Emissions
No Action Alternative

| Scenario | Type Training | Reference | Days (a) | Operations (b) | Ground Vehicles | Number | Engine Load | Hours per day | Horsepower | Emissions Factors (lb/hr) | | | | | Emissions (lbs) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | CO | NOx | ROG | SOx | PM10 | CO | Nox | ROG | Sox | PM |
| 47 | Communications Training | | 2 | 1 | 4WD Pickups | 4 | | 2 | | 0.20 | 0.02 | 0.01 | 0.00 | 0.00 | 3.23 | 0.27 | 0.19 | 0.00 | 0.02 |
| | | | 2 | 1 | RTVs | 4 | 48% | 8 | 93.0 | 0.01 | 0.02 | 0.00 | 0.00 | 0.00 | 21.75 | 43.01 | 6.17 | 5.65 | 4.30 |
| | | | 2 | 1 | Bus | 2 | | 2 | | 0.21 | 0.74 | 0.04 | 0.00 | 0.02 | 1.64 | 5.92 | 0.33 | 0.01 | 0.13 |
| | | | 2 | 1 | Tractor with flat b | 1 | 80% | 1 | | 0.25 | 0.30 | 0.02 | 0.00 | 0.01 | 0.39 | 0.48 | 0.03 | 0.00 | 0.02 |
| 48 | Field Training Exercise with a Beach Camp | | 14 | 1 | HMMWVs | 2 | 65% | 3 | | 0.18 | 2.06 | 0.60 | 0.19 | 0.17 | 10.09 | 112.67 | 32.86 | 10.45 | 9.39 |
| | | | 14 | 1 | 5-ton truck | 1 | 80% | 1 | | 0.25 | 0.30 | 0.02 | 0.00 | 0.01 | 2.75 | 3.34 | 0.24 | 0.01 | 0.16 |
| | | | 14 | 1 | Dozer | 2 | 59% | 8 | 240.0 | 0.01 | 0.02 | 0.00 | 0.00 | 0.00 | 182.51 | 579.70 | 65.03 | 0.42 | 34.40 |
| | | | 14 | 1 | 4WD Pickups | 10 | | 2 | | 0.20 | 0.02 | 0.01 | 0.00 | 0.00 | 56.56 | 4.73 | 3.39 | 0.06 | 0.29 |
| | | | 14 | 1 | Fuel Truck | 1 | | 2 | | 0.20 | 0.02 | 0.01 | 0.00 | 0.00 | 5.66 | 0.47 | 0.34 | 0.01 | 0.03 |
| | | | 14 | 1 | 20-ton Stake Tru | 1 | | 2 | | 0.10 | 0.46 | 0.02 | 0.01 | 0.02 | 2.88 | 12.82 | 0.50 | 0.17 | 0.52 |
| | | | 14 | 1 | 50-ton Low-bed T | 1 | | 2 | | 0.10 | 0.46 | 0.02 | 0.01 | 0.02 | 2.88 | 12.82 | 0.50 | 0.17 | 0.52 |
| | | | 14 | 1 | Wheeled Loader | 2 | 47% | 8 | 147.0 | 0.01 | 0.02 | 0.00 | 0.00 | 0.00 | 115.11 | 235.28 | 30.04 | 0.20 | 13.23 |
| | | | 14 | 1 | Generators/vario | 23 | 30% | 24 | Various | 11.98 | 55.59 | 4.52 | 3.67 | 3.93 | 1207.34 | 5603.77 | 456.01 | 369.50 | 395.73 |
| | | | 14 | 1 | Heaters | 117 | 51% | 8 | 238.0 | 0.00 | 0.02 | 0.00 | 0.00 | 0.00 | 5926.17 | 23880.02 | 2209.16 | 21.04 | 827.56 |
| | | | 14 | 1 | Welder | 6 | 45% | 8 | 45.0 | 0.01 | 0.01 | 0.01 | 0.00 | 0.00 | 201.60 | 181.80 | 85.80 | 0.21 | 19.86 |
| | | | 14 | 1 | LARCV | 2 | | 2 | 350.0 | 10.85 | 2.338 | 0.879935 | 0.7175 | 0.77 | 607.60 | 130.93 | 49.28 | 40.18 | 43.12 |
| 49 | Maritime Pre-positioning Ships (MPS) Offload | | 5 | 1 | HMMWVs | 2 | 65% | 3 | | 0.18 | 2.06 | 0.60 | 0.19 | 0.17 | 3.60 | 40.24 | 11.74 | 3.73 | 3.35 |
| | | | 5 | 1 | 5-ton truck | 1 | 80% | 1 | | 0.25 | 0.30 | 0.02 | 0.00 | 0.01 | 0.98 | 1.19 | 0.08 | 0.00 | 0.06 |
| | | | 5 | 1 | Dozer | 1 | 59% | 8 | 240.0 | 0.01 | 0.02 | 0.00 | 0.00 | 0.00 | 32.59 | 103.52 | 11.61 | 0.07 | 6.14 |
| | | | 5 | 1 | 4WD Pickups | 3 | | 2 | | 0.20 | 0.02 | 0.01 | 0.00 | 0.00 | 6.06 | 0.51 | 0.36 | 0.01 | 0.03 |
| | | | 5 | 1 | LARCV | 1 | | 2 | 350.0 | 10.85 | 2.338 | 0.879935 | 0.7175 | 0.77 | 108.50 | 23.38 | 8.80 | 7.18 | 7.70 |
| 50 | Reverse Osmosis Water Purification Unit | | 4 | 4 | 4WD Pickups | 2 | | 2 | | 0.20 | 0.02 | 0.01 | 0.00 | 0.00 | 12.93 | 1.08 | 0.77 | 0.01 | 0.07 |
| | | | 4 | 4 | RTVs | 6 | 48% | 8 | 93.0 | 0.01 | 0.02 | 0.00 | 0.00 | 0.00 | 309.65 | 564.70 | 95.74 | 0.52 | 51.61 |
| | | | 4 | 4 | Generator | 1 | 74% | 8 | 22.0 | 0.01 | 0.01 | 0.00 | 0.00 | 0.00 | 12.41 | 18.84 | 6.66 | 4.17 | 2.76 |
| | | | 4 | 4 | Flatbed Truck | 1 | 80% | 1 | | 0.25 | 0.30 | 0.02 | 0.00 | 0.01 | 3.14 | 3.81 | 0.27 | 0.01 | 0.18 |
| 51 | Roll-on/Roll-off Discharge Facility | | 5 | 1 | HMMWVs/Jeeps | 3 | 65% | 3 | | 0.18 | 2.06 | 0.60 | 0.19 | 0.17 | 5.41 | 60.36 | 17.60 | 5.60 | 5.03 |
| | | | 5 | 1 | 6-ton truck | 1 | 80% | 1 | | 0.25 | 0.30 | 0.02 | 0.00 | 0.01 | 0.98 | 1.19 | 0.08 | 0.00 | 0.06 |
| | | | 5 | 1 | Dozer | 1 | 59% | 8 | 240.0 | 0.01 | 0.02 | 0.00 | 0.00 | 0.00 | 32.59 | 103.52 | 11.61 | 0.07 | 6.14 |
| | | | 5 | 1 | Cranes | 2 | 43% | 8 | 94.0 | 0.00 | 0.02 | 0.00 | 0.00 | 0.00 | 13.97 | 50.12 | 4.99 | 0.04 | 1.92 |
| | | | 5 | 1 | RTVs | 2 | 48% | 8 | 93.0 | 0.01 | 0.02 | 0.00 | 0.00 | 0.00 | 32.26 | 58.82 | 9.97 | 0.05 | 5.38 |
| | | | 5 | 1 | LARCV | 2 | | 2 | 350.0 | 10.85 | 2.338 | 0.879935 | 0.7175 | 0.77 | 217.00 | 46.76 | 17.60 | 14.35 | 15.40 |
| 52 | MPF Utility Boat Operator Course | | 9 | 2 | Dozer | 1 | 59% | 8 | 240.0 | 0.01 | 0.02 | 0.00 | 0.00 | 0.00 | 117.33 | 372.66 | 41.81 | 0.27 | 22.12 |
| | | | 9 | 2 | Van | 1 | | 2 | | 0.20 | 0.02 | 0.01 | 0.00 | 0.00 | 7.27 | 0.61 | 0.44 | 0.01 | 0.04 |
| | | | 9 | 2 | LARCV | 2 | | 2 | 350.0 | 10.85 | 2.338 | 0.879935 | 0.7175 | 0.77 | 781.20 | 168.34 | 63.36 | 51.66 | 55.44 |
| 53 | LARC V Operator Training | | 6 | 1 | LARCV | 2 | | 2 | 350.0 | 10.85 | 2.338 | 0.879935 | 0.7175 | 0.77 | 260.40 | 56.11 | 21.12 | 17.22 | 18.48 |
| **4.9.1** | **Conduct Mission Area Training** | | | | | | | | | | | | | | | | | | |
| | **NSW Diving and Beach Operations** | | | | | | | | | | | | | | | | | | |
| 54 | Lung Automatic Rebreather (LAR) V Closed Circuit Breathing Divir | | 1 | 126 | 4WD Pickups | 3 | | 2 | | 0.20 | 0.02 | 0.01 | 0.00 | 0.00 | 152.71 | 12.78 | 9.15 | 0.17 | 0.77 |
| | | | 1 | 126 | Bus | 2 | | 2 | | 0.21 | 0.74 | 0.04 | 0.00 | 0.02 | 103.32 | 373.26 | 20.71 | 0.43 | 8.42 |
| 55 | Open Circuit Breathing Diving | | 1 | 12 | 4WD Pickups | 3 | | 2 | | 0.20 | 0.02 | 0.01 | 0.00 | 0.00 | 14.54 | 1.22 | 0.87 | 0.02 | 0.07 |
| | | | 1 | 12 | Bus | 2 | | 2 | | 0.21 | 0.74 | 0.04 | 0.00 | 0.02 | 9.84 | 35.55 | 1.97 | 0.04 | 0.80 |
| 56 | OTB Field Training Exercise | | 5 | 36 | 4WD Pickups | 3 | | 2 | | 0.20 | 0.02 | 0.01 | 0.00 | 0.00 | 218.16 | 18.25 | 13.07 | 0.25 | 1.11 |
| 57 | Rock Portage | | 1 | 18 | 4WD Pickups | 1 | | 2 | | 0.20 | 0.02 | 0.01 | 0.00 | 0.00 | 7.27 | 0.61 | 0.44 | 0.01 | 0.04 |
| | **NSW Land Warfare** | | | | | | | | | | | | | | | | | | |
| 58 | Land Patrolling | | 1 | 18 | 4WD Pickups | 2 | | 2 | | 0.20 | 0.02 | 0.01 | 0.00 | 0.00 | 14.54 | 1.22 | 0.87 | 0.02 | 0.07 |
| 59 | Immediate Action Drills | | 1 | 5 | 4WD Pickups | 2 | | 2 | | 0.20 | 0.02 | 0.01 | 0.00 | 0.00 | 4.04 | 0.34 | 0.24 | 0.00 | 0.02 |
| | **NSW Advanced Training** | | | | | | | | | | | | | | | | | | |
| 60 | Over the Beach Insertion / Photo Reconnaissance | | 1 | 31 | 4WD Pickup | 2 | | 2 | | 0.20 | 0.02 | 0.01 | 0.00 | 0.00 | 25.05 | 2.10 | 1.50 | 0.03 | 0.13 |
| 61 | Photo Image Capture | | 14 | 3 | 4WD Pickups | 2 | | 2 | | 0.20 | 0.02 | 0.01 | 0.00 | 0.00 | 33.94 | 2.84 | 2.03 | 0.04 | 0.17 |
| 62 | Field Skills (Observation Drill, Sketching, Range Estimation) | | 1 | 22 | 4WD Pickups | 2 | | 2 | | 0.20 | 0.02 | 0.01 | 0.00 | 0.00 | 17.78 | 1.49 | 1.06 | 0.02 | 0.09 |
| 63 | Stalking, Movement and Hide-Sites | | 5 | 8 | 4WD Pickups | 3 | | 2 | | 0.20 | 0.02 | 0.01 | 0.00 | 0.00 | 48.48 | 4.06 | 2.90 | 0.06 | 0.25 |

Table C-4
Ground Vehicle Emissions
No Action Alternative

| Scenario | Type Training | Reference | Days (a) | Operations (b) | Ground Vehicles | Number | Engine Load | Hours per day | Horsepower | Emissions Factors (lb/hr) | | | | | Emissions (lbs) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | CO | NOx | ROG | SOx | PM10 | CO | Nox | ROG | Sox | PM |
| 64 | CQC/CQD | | 1 | 109 | 4WD Pickups | 5 | | 2 | | 0.20 | 0.02 | 0.01 | 0.00 | 0.00 | 220.18 | 18.42 | 13.19 | 0.25 | 1.12 |
| 65 | Communications | | 5 | 6 | 4WD Pickups | 6 | | 2 | | 0.20 | 0.02 | 0.01 | 0.00 | 0.00 | 72.72 | 6.08 | 4.36 | 0.08 | 0.37 |
| 66 | Unmanned Aerial Vehicle (UAV) Training | | 5 | 12 | 4WD Pickups | 1 | | 2 | | 0.20 | 0.02 | 0.01 | 0.00 | 0.00 | 24.24 | 2.03 | 1.45 | 0.03 | 0.12 |
| 67 | Around the World Training | | 1 | 6 | 4WD Pickups | 4 | | 2 | | 0.20 | 0.02 | 0.01 | 0.00 | 0.00 | 9.70 | 0.81 | 0.58 | 0.01 | 0.05 |
| **4.9.4** | **Provide/Execute Training for U.S. and Other Nation Units and Individuals** | | | | | | | | | | | | | | | | | | |
| | **NSW Physical Fitness Training** | | | | | | | | | | | | | | | | | | |
| 68 | Physical Training Runs | | 1 | 464 | 4WD Pickups | 3 | | 2 | | 0.20 | 0.02 | 0.01 | 0.00 | 0.00 | 562.37 | 47.05 | 33.69 | 0.64 | 2.85 |
| 69 | Physical Conditioning Training Exercise | | 1 | 280 | 4WD Pickups | 2 | | 2 | | 0.20 | 0.02 | 0.01 | 0.00 | 0.00 | 226.24 | 18.93 | 13.55 | 0.26 | 1.15 |
| 70 | Swim Training | | 1 | 170 | 4WD Pickups | 1 | | 2 | | 0.20 | 0.02 | 0.01 | 0.00 | 0.00 | 68.68 | 5.75 | 4.11 | 0.08 | 0.35 |
| 71 | Hell Week | | 5 | 6 | 4WD Pickups | 3 | | 2 | | 0.20 | 0.02 | 0.01 | 0.00 | 0.00 | 36.36 | 3.04 | 2.18 | 0.04 | 0.18 |
| 72 | Rucksack March | | 1 | 54 | 4WD Pickups | 3 | | 2 | | 0.20 | 0.02 | 0.01 | 0.00 | 0.00 | 65.45 | 5.48 | 3.92 | 0.07 | 0.33 |
| 73 | Monster Mash | | 1 | 6 | 4WD Pickups | 3 | | 2 | | 0.20 | 0.02 | 0.01 | 0.00 | 0.00 | 7.27 | 0.61 | 0.44 | 0.01 | 0.04 |
| **4.12.6** | **Provide Industrial and Environmental Health Services** | | | | | | | | | | | | | | | | | | |
| 74 | Conduct Environmental Health Site Assessment | | 3 | 3 | 4WD Pickups | 4 | | 2 | | 0.20 | 0.02 | 0.01 | 0.00 | 0.00 | 14.54 | 1.22 | 0.87 | 0.02 | 0.07 |
| | | | 3 | 3 | 5-ton truck | 1 | | 2 | | 0.25 | 0.30 | 0.02 | 0.00 | 0.01 | 4.41 | 5.36 | 0.38 | 0.01 | 0.26 |
| | | | 3 | 3 | 3/4-ton trailer | 1 | | 2 | | 0.25 | 0.30 | 0.02 | 0.00 | 0.01 | 4.41 | 5.36 | 0.38 | 0.01 | 0.26 |
| | | | 3 | 3 | small trailers | 3 | | 2 | | 0.20 | 0.02 | 0.01 | 0.00 | 0.00 | 10.91 | 0.91 | 0.65 | 0.01 | 0.06 |
| **6.1.1** | **Conduct Explosive Ordnance Disposal** | | | | | | | | | | | | | | | | | | |
| 75 | Conventional Ordnance/Improvised Explosive Device Response | | 1 | 64 | 4WD Pickups | 2 | | 2 | | 0.20 | 0.02 | 0.01 | 0.00 | 0.00 | 51.71 | 4.33 | 3.10 | 0.06 | 0.26 |
| 76 | Land Mine Detection/Neutralization | | 1 | 24 | 4WD Pickups / V | 2 | | 2 | | 0.20 | 0.02 | 0.01 | 0.00 | 0.00 | 19.39 | 1.62 | 1.16 | 0.02 | 0.10 |
| **6.3.1** | **Force Protection: Protect and Secure Area of Operations** | | | | | | | | | | | | | | | | | | |
| 77 | Field Training Exercise (FTX) e.g. SEAHAWK | | 14 | 53 | 4WD Pickups | 140 | | 2 | | 0.20 | 0.02 | 0.01 | 0.00 | 0.00 | 28.28 | 2.37 | 1.69 | 0.03 | 0.14 |
| | | | 14 | 53 | Generators | 176 | 74% | 2 | 22.0 | 0.01 | 0.01 | 0.00 | 0.00 | 0.00 | 1.05 | 1.59 | 0.56 | 0.35 | 0.23 |
| | | | 14 | 53 | Forklift | 8 | 48% | 8 | 37.0 | 0.01 | 0.01 | 0.00 | 0.00 | 0.00 | 0.05 | 0.07 | 0.03 | 0.02 | 0.01 |
| **6.3.3** | **Combat Terrorism** | | | | | | | | | | | | | | | | | | |
| 78 | Small Boat Attack | | 1 | 30 | None | | | | | | | | | | | | | | |
| | | | | | | | | | | | | **lbs/year** | | | **48088.47** | **93132.29** | **11475.12** | **4149.54** | **6683.55** |
| | | | | | | | | | | | | **tons/year** | | | **24.04** | **46.57** | **5.74** | **2.07** | **3.34** |

Assumptions: Fuel truck is equivalent to 4WD vehicle; large trucks modeled as MDTs. Busses assumed to be diesel powered
Emission factors from ARB's OFFROAD 2007 Model

| Scenario | Type Training | Reference | Days (a) | Operations (b) | Ordnance | Number | Type | Compound | Number or Amount | Weight of Compound, grams | CO lbs/item | NOX lbs/item | ROG lbs/item | SOX lbs/item | PM10 lbs/item | Emissions, lbs/year Total CO | Total NOx | Total ROG | Total SOx | Total PM10 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Conduct Maneuver - Move Forces** | | | | | | | | | | | | | | | | | | | |
| 1 | Anchoring | | 1 | 72 | None | | | | | | | | | | | | | | | |
| 2 | Towing | | 1 | 30 | None | | | | | | | | | | | | | | | |
| 3 | Moor to Buoy | | 1 | 36 | None | | | | | | | | | | | | | | | |
| **1.3.1** | **Perform Mine Countermeasures** | | | | | | | | | | | | | | | | | | | |
| 4 | Parachute Operations | | 1 | 216 | Smoke Grenades/Flares | 3 | Smoke Gre | *M18 Green* | 648 | | 1.20E-02 | 1.70E-05 | 2.10E-03 | 1.60E-04 | 1.30E-01 | 7.78E+00 | 1.10E-02 | 1.36E+00 | 1.04E-01 | 8.42E+01 |
| | | | | | | | Green Para | M195 | 648 | | 9.40E-03 | 2.40E-03 | | 7.80E-05 | 1.20E-01 | 6.09E+00 | 1.56E+00 | 0.00E+00 | 5.05E-02 | 7.78E+01 |
| 5 | MCM Operations | | 1 | 32 | Blast Caps/ Diver Recalls | 1 | Underwater | | | | | | | | | | | | | |
| 6 | Floating Mine Operations | | 1 | 25 | Blast Caps/ Diver Recalls | 1 | | | 25 | | 0.026 | 0.008 | | 0.000 | 0.003 | 6.50E-01 | 1.98E-01 | 0.00E+00 | 3.75E-03 | 6.50E-02 |
| 7 | Dive Platoon | | 1 | 8 | Blast Caps/Explosives | 9 per training | Underwater | | | | | | | | | | | | | |
| | | | 1 | 8 | 3.5 lb | 8 sequential command detonated | Underwater | | | | | | | | | | | | | |
| 8 | Very Shallow Water (VSW) Operator Course | | 8 | 4 | Diver Recalls | 2 per training | Underwater | | | | | | | | | | | | | |
| 9 | VSW Mine Countermeasure Operations | | 1 | 120 | Diver Recalls | 2 per training | Underwater | | | | | | | | | | | | | |
| 10 | Autonomous Underwater Vehicle (AUV) Operations/UUV Operatio | | 1 | 120 | Blast Caps/ Diver Recalls | 2 per training | Underwater | | | | | | | | | | | | | |
| 11 | MK8 Marine Mammal/MMS Operations | | 1 | 175 | 13lbs [MK 87/88 C-4 in GRP | Approximately 10% of training inv | Underwater | | | | | | | | | | | | | |
| | | | | | 29lb [MK86/89 PBXN in AL canis | Approximately 10% of training inv | Underwater | | | | | | | | | | | | | |
| 12 | Mine Neutralization | | 1 | 4 | Blast Caps/ Diver Recalls | 9 per training | Underwater | | 8 | | 0.026 | 0.008 | | 0.000 | 0.003 | 2.08E-01 | 6.32E-02 | 0.00E+00 | 1.20E-03 | 2.08E-02 |
| | | | 1 | 4 | 3.5lb explosive | 8 sequential command detonated | Underwater | | | | | | | | | | | | | |
| **1.4.6** | **Conduct Maritime Interception** | | | | | | | | | | | | | | | | | | | |
| 13 | Visit, Board, Search and Seizure | | 1 | 30 | None | | | | | | | | | | | | | | | |
| **1.5.4** | **Conduct Amphibious Operations** | | | | | | | | | | | | | | | | | | | |
| 14 | Small Boat Handling | | 1 | 94 | None | | | | | | | | | | | | | | | |
| 15 | Swimmer Conditioning - Bay and Ocean with fins | | 1 | 189 | None | | | | | | | | | | | | | | | |
| 16 | Basic Reconnaissance Course Final Mission | | 1 | 8 | None | | | | | | | | | | | | | | | |
| 17 | Obstacle Course | | 1 | 138 | None | | | | | | | | | | | | | | | |
| 18 | Hydrographic Reconnaissance | | 1 | 40 | None | | | | | | | | | | | | | | | |
| 19 | Surf Observations (SUROBS) | | 1 | 116 | None | | | | | | | | | | | | | | | |
| 20 | CRRC Inflatable Boat Small (IBS)/Surf Passage/Boat Team Orgar | | 1 | 72 | None | | | | | | | | | | | | | | | |
| 21 | CRRC Towing and High Speed Maneuver | | 1 | 8 | None | | | | | | | | | | | | | | | |
| 22 | CRRC Bay Landing Craft Utility (LCU) Launch and Recover - Bay | | 1 | 24 | None | | | | | | | | | | | | | | | |
| 23 | CRRC Navigation, Bay and Ocean Runs | | 1 | 26 | None | | | | | | | | | | | | | | | |
| 24 | Amphibious Raid Course Final Mission | | 1 | 24 | None | | | | | | | | | | | | | | | |
| 25 | Amphibious Raid Operations | | 3 | 2 | Flares | 3 | Green Para | *M195* | 6 | | 9.40E-03 | 2.40E-03 | | 7.80E-05 | 1.20E-01 | 5.64E-02 | 1.44E-02 | 0.00E+00 | 4.68E-04 | 7.20E-01 |
| | | | | | Grenades | 20 | Grenades | *M116A1* | 40 | | 3.70E-04 | 5.60E-03 | 4.20E-05 | 4.70E-04 | 1.20E-01 | 1.48E-02 | 2.24E-01 | 1.68E-03 | 1.88E-02 | 4.80E+00 |
| | | | | | 9MM | 210 | 9 MM | | 210 | | 3.10E-04 | 1.50E-05 | | 8.20E-08 | 2.40E-05 | 6.51E-02 | 3.15E-03 | 0.00E+00 | 1.72E-05 | 5.04E-03 |
| | | | | | 5.56MM/38CAL | 60/15 | 5.56 Blank | | 60 | | 2.80E-04 | 2.00E-05 | | 9.80E-03 | 6.90E-06 | 1.68E-02 | 1.20E-03 | 0.00E+00 | 5.88E-01 | 4.14E-04 |
| | | | | | | | 38 cal Blank | | 15 | | 1.00E-04 | 6.80E-05 | | 6.30E-07 | 1.80E-05 | 1.50E-03 | 1.02E-03 | | 9.45E-06 | |
| | | | | | Diver Recalls | 3 | Underwater | | | | | | | | | | | | | |
| 26 | Direct Action (DA) Operations | | 3 | 2 | Explosives | 10 | | | 20 | | 0.026 | 0.008 | | 0.000 | 0.003 | 5.20E-01 | 1.58E-01 | 0.00E+00 | 3.00E-03 | 5.20E-02 |
| | | | | | Smoke | 3 | Smoke | | 6 | | 1.20E-02 | 1.70E-05 | 2.10E-03 | 1.60E-04 | 1.30E-01 | 7.20E-02 | 1.02E-04 | 1.26E-02 | 9.60E-04 | 7.80E-01 |
| | | | | | 9MM | 137 per year | 9 MM | | 137 | | 3.10E-04 | 1.50E-05 | | 8.20E-08 | 2.40E-05 | 4.25E-02 | 2.06E-03 | 0.00E+00 | 1.12E-05 | 3.29E-03 |
| | | | | | 5.56MM/38CAL | 50/10 per year | 5.56 Blank | | 50 | | 2.80E-04 | 2.00E-05 | | 9.80E-03 | 6.90E-06 | 1.40E-02 | 1.00E-03 | 0.00E+00 | 4.90E-01 | 3.45E-04 |
| | | | | | | | 38 cal | | 10 | | 1.00E-04 | 6.80E-05 | | 6.30E-07 | 1.80E-05 | 1.00E-03 | 6.80E-04 | 0.00E+00 | 6.30E-06 | 1.80E-04 |
| | | | | | Diver Recalls | 3 | Underwater | | | | | | | | | | | | | |
| 27 | Craft Landing Zone (CLZ) | | 1 | 4 | Smoke | 3 | Smoke | | 12 | | 1.20E-02 | 1.70E-05 | 2.10E-03 | 1.60E-04 | 1.30E-01 | 1.44E-01 | 2.04E-04 | 2.52E-02 | 1.92E-03 | 1.56E+00 |
| **1.5.7** | **Conduct Naval Special Warfare** | | | | | | | | | | | | | | | | | | | |
| 28 | Swimmer/Combat Rubber Raiding Craft Over-the-Beach | | 4 | 52 | Smokes/Flares/Surface Explosiv | 3 flares, 10 grenades | Grenades | *M116A1* | 520 | | 3.70E-04 | 5.60E-03 | 4.20E-05 | 4.70E-04 | 1.20E-01 | 1.92E-01 | 2.91E+00 | 2.18E-02 | 2.44E-01 | 6.24E+01 |
| | | | | | | | Green Para | *M195* | 156 | | 9.40E-03 | 2.40E-03 | | 7.80E-05 | 1.20E-01 | 1.47E+00 | 3.74E-01 | 0.00E+00 | 1.22E-02 | 1.87E+01 |
| | | | | | Small Arms | 6600/5000 .5 cal/7.62 mm | 0.5 cal | | 6600 | | 1.80E-03 | 2.80E-05 | | | 9.80E-05 | 1.19E+01 | 1.85E-01 | 0.00E+00 | 0.00E+00 | 6.47E-01 |
| | | | | | | | 7.62 mm | | 5000 | | 6.80E-04 | 4.40E-05 | | 3.50E-07 | 1.70E-05 | 3.40E+00 | 2.20E-01 | 0.00E+00 | 1.75E-03 | 8.50E-02 |
| 29 | Over-the-Beach Stalk | | 1 | 16 | None | | | | | | | | | | | | | | | |
| 30 | Immediate Action Drills | | 1 | 8 | Smokes/Flares/Surface | 10 | Grenades | *M116A1* | 80 | | 3.70E-04 | 5.60E-03 | 4.20E-05 | 4.70E-04 | 1.20E-01 | 2.96E-02 | 4.48E-01 | 3.36E-03 | 3.76E-02 | 9.60E+00 |
| | | | | | | 3 | Green Para | M195 | 24 | | 9.40E-03 | 2.40E-03 | | 7.80E-05 | 1.20E-01 | 2.26E-01 | 5.76E-02 | 0.00E+00 | 1.87E-03 | 2.88E+00 |
| | | | | 6 | Small Arms | 5000 | 0.50 cal/7.62 blank | | 30000 | | 1.80E-03 | 2.80E-05 | | | 9.80E-05 | 5.40E+01 | 8.40E-01 | 0.00E+00 | 0.00E+00 | 2.94E+00 |
| 31 | Breacher Training | | 1 | 20 | Small Arms | 0 | 12 gauge | | 150 | | 1.50E-03 | 4.20E-05 | | | 7.40E-05 | 2.25E-01 | 6.30E-03 | 0.00E+00 | 0.00E+00 | 1.11E-02 |
| 32 | Amphibious Warfare Exercise | | 1 | 50 | Smoke Grenades/Flares | 3 | | | | | | | | | | | | | | |

Table C-5
Ordnance Emissions
No Action Alternative

| Scenario | Type Training | Reference | Days (a) | Operations (b) | Ordnance | Number | Type | Compound | Number or Amount | Weight of Compound, grams | CO lbs/item | NOX lbs/item | ROG lbs/item | SOX lbs/item | PM10 lbs/item | Total CO | Total NOx | Total ROG | Total SOx | Total PM10 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 33 | Mobility Primary Mission Area | | 1 | 200 | Smoke/Flares | 3 | Smoke | | 600 | | 1.20E-02 | 1.70E-05 | 2.10E-03 | 1.60E-04 | 1.30E-01 | 7.20E+00 | 1.02E-02 | 1.26E+00 | 9.60E-02 | 7.80E+01 |
| 34 | Escape and Evasion | | 1 | 20 | Smoke/Flares | 3 | Smoke | | 60 | | 1.20E-02 | 1.70E-05 | 2.10E-03 | 1.60E-04 | 1.30E-01 | 7.20E-01 | 1.02E-03 | 1.26E-01 | 9.60E-03 | 7.80E+00 |
| **2.2.3** | **Perform Tactical Reconnaissance and Surveillance** | | | | | | | | | | | | | | | | | | | |
| 35 | Helicopter Rope Suspension Training/Cast & Recovery Operation | | 1 | 124 | Smoke Grenades/Flares | 3 | Smoke | | 372 | | 1.20E-02 | 1.70E-05 | 2.10E-03 | 1.60E-04 | 1.30E-01 | 4.46E+00 | 6.32E-03 | 7.81E-01 | 5.95E-02 | 4.84E+01 |
| 36 | Rappel and Fast Rope Training | | 1 | 6 | None | 0 | | | | | | | | | | | | | | |
| 37 | SEAL Delivery Vehicle (SDV)/Advanced Seal Delivery System (AS | | 14 | 14 | ≤ 10 lbs C-4 (underwater) | 1 | Underwater | | | | | | | | | | | | | |
| **4.5.6** | **Construct, Maintain, and Operate Logistics Over-the-Shore** | | | | | | | | | | | | | | | | | | | |
| 38 | OPDS | | 25 | 6 | None | 0 | | | | | | | | | | | | | | |
| 39 | Amphibious Bulk Liquid Transfer System (ABLTS) | | 10 | 4 | None | 0 | | | | | | | | | | | | | | |
| 40 | Barge Ferry/Causeway Coxswain Training | | 3 | 34 | None | 0 | | | | | | | | | | | | | | |
| 41 | Causeway Pier Insertion and Retraction | | 5 | 9 | None | 0 | | | | | | | | | | | | | | |
| 42 | Elevated Causeway System (ELCAS) | | 10 | 2 | None | 0 | | | | | | | | | | | | | | |
| 43 | Establish Beach Party Command Post | | 4 | 16 | 5.56 caliber rounds | 30 | 5.56 Blank | | 30 | | 2.80E-04 | 2.00E-05 | | 9.80E-03 | 6.90E-06 | 8.40E-03 | 6.00E-04 | 0.00E+00 | 2.94E-01 | 2.07E-04 |
| | | | | | 7.62 caliber blanks | 100 | 7.62 caliber blanks | | 100 | (b) | 6.80E-04 | 4.40E-05 | | 3.50E-07 | 1.70E-05 | 6.80E-02 | 4.40E-03 | 0.00E+00 | 3.50E-05 | 1.70E-03 |
| 44 | Sterngate Marriage to Amphibious Ship/LCU | | 1 | 40 | None | 0 | | | | | | | | | | | | | | |
| 45 | LCU/LCM Beaching | | 1 | 60 | None | 0 | | | | | | | | | | | | | | |
| 46 | LCU/LCM Towing/Being Towed | | 1 | 60 | None | 0 | | | | | | | | | | | | | | |
| 47 | Communications Training | | 2 | 1 | 0 | | | | | | | | | | | | | | | |
| 48 | Field Training Exercise with a Beach Camp | | 14 | 1 | 5.56 caliber rounds | 30 | 5.56 Blank | | 30 | (c) | 2.80E-04 | 2.00E-05 | | 9.80E-03 | 6.90E-06 | 8.40E-03 | 6.00E-04 | 0.00E+00 | 2.94E-01 | 2.07E-04 |
| | | | | | 7.62 caliber blanks | 100 | 7.62 caliber blanks | | 100 | (c) | 6.80E-04 | 4.40E-05 | | 3.50E-07 | 1.70E-05 | 6.80E-02 | 4.40E-03 | 0.00E+00 | 3.50E-05 | 1.70E-03 |
| 49 | Maritime Pre-positioning Ships (MPS) Offload | | 5 | 1 | None | 0 | | | | | | | | | | | | | | |
| 50 | Reverse Osmosis Water Purification Unit | | 4 | 4 | None | 0 | | | | | | | | | | | | | | |
| 51 | Roll-on/Roll-off Discharge Facility | | 5 | 1 | None | 0 | | | | | | | | | | | | | | |
| 52 | MPF Utility Boat Operator Course | | 9 | 2 | None | 0 | | | | | | | | | | | | | | |
| 53 | LARC V Operator Training | | 6 | 1 | None | 0 | | | | | | | | | | | | | | |
| **4.9.1** | **Conduct Mission Area Training** | | | | | | | | | | | | | | | | | | | |
| | **NSW Diving and Beach Operations** | | | | | | | | | | | | | | | | | | | |
| 54 | Lung Automatic Rebreather (LAR) V Closed Circuit Breathing Divi | | 1 | 126 | Diver Recall | 1 | Underwater | | | | | | | | | | | | | |
| 55 | Open Circuit Breathing Diving | | 1 | 12 | Diver Recall | 1 | Underwater | | | | | | | | | | | | | |
| 56 | OTB Field Training Exercise | | 5 | 36 | Small arm | 15000 7.62mm; 19800 .5cal ANN | 7.62 mm | | 15000 | | 6.80E-04 | 4.40E-05 | | 3.50E-07 | 1.70E-05 | 1.02E+01 | 6.60E-01 | 0.00E+00 | 5.25E-03 | 2.55E-01 |
| | | | | | | | 0.5 cal | | 19800 | | 1.80E-03 | 2.80E-05 | | | 9.80E-05 | 3.56E+01 | 5.54E-01 | 0.00E+00 | 0.00E+00 | 1.94E+00 |
| 57 | Rock Portage | | 1 | 18 | Smoke Grenades/Flares | 3 | Smoke | | 54 | | 1.20E-02 | 1.70E-05 | 2.10E-03 | 1.60E-04 | 1.30E-01 | 6.48E-01 | 9.18E-04 | 1.13E-01 | 8.64E-03 | 7.02E+00 |
| | | | | | | | Grenades | *M116A1* | 54 | | 3.70E-04 | 5.60E-03 | 4.20E-05 | 4.70E-04 | 1.20E-01 | 2.00E-02 | 3.02E-01 | 2.27E-03 | 2.54E-02 | 6.48E+00 |
| | **NSW Land Warfare** | | | | | | | | | | | | | | | | | | | |
| 58 | Land Patrolling | | 1 | 18 | None | 0 | | | | | | | | | | | | | | |
| 59 | Immediate Action Drills | | 1 | 5 | 50CAL/7.62 BLANK | 5000 RNDS per operation (25000 | 0.5 cal | | 25000 | | 1.80E-03 | 2.80E-05 | | | 9.80E-05 | 4.50E+01 | 7.00E-01 | 0.00E+00 | 0.00E+00 | 2.45E+00 |
| | | | | | | | 7.62 blank | | | | 6.80E-04 | 4.40E-05 | | 3.50E-07 | 1.70E-05 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| | **NSW Advanced Training** | | | | | | | | | | | | | | | | | | | |
| 60 | Over the Beach Insertion / Photo Reconnaissance | | 1 | 31 | Small arms/blanks | 10 9 mm blanks; 10 5.56 blanks p | 9 mm blank | | 310 | | 3.10E-04 | 1.50E-05 | | 8.20E-08 | 2.40E-05 | 9.61E-02 | 4.65E-03 | 0.00E+00 | 2.54E-05 | 7.44E-03 |
| | | | | | | | 5.56 blank | | 310 | | 2.80E-04 | 2.00E-05 | | 9.80E-03 | 6.90E-06 | 8.68E-02 | 6.20E-03 | 0.00E+00 | 3.04E+00 | 2.14E-03 |
| 61 | Photo Image Capture | | 14 | 3 | Small arms/blanks | 10 9 mm blanks; 10 5.56 blanks p | 9 mm blank | | 30 | | 3.10E-04 | 1.50E-05 | | 8.20E-08 | 2.40E-05 | 9.30E-03 | 4.50E-04 | 0.00E+00 | 2.46E-06 | 7.20E-04 |
| | | | | | | | 5.56 blank | | 30 | | 2.80E-04 | 2.00E-05 | | 9.80E-03 | 6.90E-06 | 8.40E-03 | 6.00E-04 | 0.00E+00 | 2.94E-01 | 2.07E-04 |
| 62 | Field Skills (Observation Drill, Sketching, Range Estimation) | | 1 | 22 | Small arms/blanks | 10 9 mm blanks; 10 5.56 blanks p | 9 mm blank | | 220 | | 3.10E-04 | 1.50E-05 | | 8.20E-08 | 2.40E-05 | 6.82E-02 | 3.30E-03 | 0.00E+00 | 1.80E-05 | 5.28E-03 |
| | | | | | | | 5.56 blank | | 220 | | 2.80E-04 | 2.00E-05 | | 9.80E-03 | 6.90E-06 | 6.16E-02 | 4.40E-03 | 0.00E+00 | 2.16E+00 | 1.52E-03 |
| 63 | Stalking, Movement and Hide-Sites | | 5 | 8 | None | | | | | | | | | | | | | | | |
| 64 | CQC/CQD | | 1 | 109 | Small Arms | 57600 9 MM simunition annual; 20000 5.56 simunition annual; | | | | | | | | | | | | | | |
| | | | | 8 | Small Arms | 7200 | 9 MM | | 57600 | | 3.10E-04 | 1.50E-05 | | | 2.40E-05 | 1.79E+01 | 8.64E-01 | 0.00E+00 | 0.00E+00 | 1.38E+00 |
| | | | | 8 | Small Arms | 10000 | 5.56 Blank | | 20000 | | 2.80E-04 | 2.00E-05 | | 9.80E-03 | 6.90E-06 | 5.60E+00 | 4.00E-01 | 0.00E+00 | 1.96E+02 | 1.38E-01 |
| | | | | | Small Arms | 4000 .38 cal | 0.38 cal | | 4000 | | 1.00E-04 | 6.80E-05 | | 6.30E-07 | 1.80E-05 | 4.00E-01 | 2.72E-01 | 0.00E+00 | 2.52E-03 | 7.20E-02 |
| | | | | 8 | Grenades (flash crash) | 3 | Grenades | *M116A1* | 327 | | 3.70E-04 | 5.60E-03 | 4.20E-05 | 4.70E-04 | 1.20E-01 | 1.21E-01 | 1.83E+00 | 1.37E-02 | 1.54E-01 | 3.92E+01 |
| 65 | Communications | | 5 | 6 | None | 0 | | | | | | | | | | | | | | |
| 66 | Unmanned Aerial Vehicle (UAV) Training | | 5 | 12 | none | 0 | | | | | | | | | | | | | | |
| 67 | Around the World Training | | 1 | 6 | none | 0 | | | | | | | | | | | | | | |
| **4.9.4** | **Provide/Execute Training for U.S. and Other Nation Units and** | | | | | | | | | | | | | | | | | | | |
| | **NSW Physical Fitness Training** | | | | | | | | | | | | | | | | | | | |
| 68 | Physical Training Runs | | 1 | 464 | None | 0 | | | | | | | | | | | | | | |
| 69 | Physical Conditioning Training Exercise | | 1 | 280 | None | 0 | | | | | | | | | | | | | | |
| 70 | Swim Training | | 1 | | None | 0 | | | | | | | | | | | | | | |

Emissions, lbs/year

Table C-5
Ordnance Emissions
No Action Alternative

| Scenario | Type Training | Reference | Days (a) | Operations (b) | Ordnance | Number | Type | Compound | Number or Amount | Weight of Compound, grams | CO lbs/item | NOX lbs/item | ROG lbs/item | SOX lbs/item | PM10 lbs/item | Total CO | Total NOx | Total ROG | Total SOx | Total PM10 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71 | Hell Week | | 5 | 6 | Smokes | 128 per year | Smoke | | 128 | | 1.20E-02 | 1.70E-05 | 2.10E-03 | 1.60E-04 | 1.30E-01 | 1.54E+00 | 2.18E-03 | 2.69E-01 | 2.05E-02 | 1.66E+01 |
| | | | | | Grenade Simulators | 200 per year | Grenades | *M116A1* | 200 | | 3.70E-04 | 5.60E-03 | 4.20E-05 | 4.70E-04 | 1.20E-01 | 7.40E-02 | 1.12E+00 | 8.40E-03 | 9.40E-02 | 2.40E+01 |
| | | | | | White Para Flares | 12 per year | Flares | *M127A1* | 12 | | 4.40E-03 | 5.70E-03 | 8.50E-05 | 1.30E-04 | 1.70E-01 | | | | | |
| | | | | | 7.62 Blank (A111) | 27000 per year | 7.62 mm | | 27000 | | 6.80E-04 | 4.40E-05 | | 3.50E-07 | 1.70E-05 | 1.84E+01 | 1.19E+00 | 0.00E+00 | 9.45E-03 | 4.59E-01 |
| | | | | | 50 CAL Blank | 2000 per year | 0.5 cal | | 2000 | | 1.80E-03 | 2.80E-05 | | | 9.80E-05 | 3.60E+00 | 5.60E-02 | 0.00E+00 | 0.00E+00 | 1.96E-01 |
| 72 | Rucksack March | | 1 | 54 | None | 0 | | | | | | | | | | | | | | |
| 73 | Monster Mash | | 1 | 6 | None | | | | | | | | | | | | | | | |
| **4.12.6** | **Provide Industrial and Environmental Health Services** | | | | | | | | | | | | | | | | | | | |
| 74 | Conduct Environmental Health Site Assessment | | 3 | 3 | None | 0 | | | | | | | | | | | | | | |
| **6.1.1** | **Conduct Explosive Ordnance Disposal** | | | | | | | | | | | | | | | | | | | |
| 75 | Conventional Ordnance/Improvised Explosive Device Response | | 1 | 64 | 0 | | | | | | | | | | | | | | | |
| 76 | Land Mine Detection/Neutralization | | 1 | 24 | 0 | | | | | | | | | | | | | | | |
| **6.3.1** | **Force Protection: Protect and Secure Area of Operations** | | | | | | | | | | | | | | | | | | | |
| 77 | Field Training Exercise (FTX) e.g. SEAHAWK | | 14 | 53 | 0.50 cal blanks | 15650 per year | | | 15650 | | 1.10E-02 | 1.20E-03 | | | 3.10E-04 | 1.72E+02 | 1.88E+01 | 0.00E+00 | 0.00E+00 | 4.85E+00 |
| | | | | | Grenades/flares | 66 per year | Grenades | *M116A1* | 66 | | 3.70E-04 | 5.60E-03 | 4.20E-05 | 4.70E-04 | 1.20E-01 | 2.44E-02 | 3.70E-01 | 2.77E-03 | 3.10E-02 | 7.92E+00 |
| | | | | | M16 Rounds | 8250 per year | | | 8250 | | 7.80E-03 | 9.80E-05 | | | 1.40E-03 | | | | | |
| | | | | | M60 Rounds | 8250 per year | | | 8250 | | 7.80E-03 | 9.80E-05 | | | 1.40E-03 | | | | | |
| | | | | | 9mm Rounds | 6600 per year | | | 6600 | | 3.10E-04 | 1.50E-05 | | 8.20E-08 | 2.40E-05 | 2.05E+00 | 9.90E-02 | 0.00E+00 | 5.41E-04 | 1.58E-01 |
| **6.3.3** | **Combat Terrorism** | | | | | | | | | | | | | | | | | | | |
| 78 | Small Boat Attack | | 1 | 30 | .50 cal rounds | 350 per exercise | | | 10500 | | 1.80E-03 | 2.80E-05 | | | 9.80E-05 | 1.89E+01 | 2.94E-01 | 0.00E+00 | 0.00E+00 | 1.03E+00 |
| | | | | | | | | | | | | | | | **lbs/year** | 432.13486 | 34.816665 | 4.002054 | 204.15236 | 515.70279 |
| | | | | | | | | | | | | | | | **tons/year** | 0.2160674 | 0.0174083 | 0.002001 | 0.1020762 | 0.2578514 |

Ordnance and explosives emission factors from AP-42

Table C-6
Aircraft GHG Emissions
No Action Alternative

| Scenario | Type Training | Reference | Days (a) | Operations (b) | Aircraft | Number | Aircraft Time on Range (hrs) | Aircraft Fuel Use per hour | Total Fuel Use | Emissions Factors (lb/gallon fuel) (c) | | | Emissions Factors (lb/operation) (c) | | | Emissions (lbs) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | CO2 | CH4 | N2O | CO2 | CH4 | N2O | CO2 | CH4 | N2O |
| **1.1.2** | **Conduct Maneuver - Move Forces** | | | | | | | | | | | | | | | | | |
| 1 | Anchoring | | 1 | 72 | None | 0 | | | | | | | | | | | | |
| 2 | Towing | | 1 | 30 | None | 0 | | | | | | | | | | | | |
| 3 | Moor to Buoy | | 1 | 36 | None | 0 | | | | | | | | | | | | |
| **1.3.1** | **Perform Mine Countermeasures** | | | | | | | | | | | | | | | | | |
| 4 | Parachute Operations | | 1 | 216 | SH60 | 1 | 1.0 | 1200.0 | 1200.0 | 21.10 | 0.00 | 0.00 | 3565.92 | 0.10 | 0.12 | 770238.3085 | 21.730861 | 24.950248 |
| 5 | MCM Operations | | 1 | 32 | None | 0 | | | | | | | | | | | | |
| 6 | Floating Mine Operations | | 1 | 25 | SH-60 - 2 Hours | 1 | 2.0 | 1200.0 | 2400.0 | 21.10 | 0.00 | 0.00 | 7131.84 | 0.20 | 0.23 | 356591.8095 | 10.060584 | 11.551041 |
| 7 | Dive Platoon | | 1 | 8 | SH-60 - 2 Hours | 1 | 2.0 | 1200.0 | 2400.0 | 21.10 | 0.00 | 0.00 | 7131.84 | 0.20 | 0.23 | 114109.379 | 3.2193869 | 3.6963331 |
| 8 | Very Shallow Water (VSW) Operator Course | | 8 | 4 | None | 0 | | | | | | | | | | | | |
| 9 | VSW Mine Countermeasure Operations | | 1 | 120 | None | 0 | | | | | | | | | | | | |
| 10 | Autonomous Underwater Vehicle (AUV) Operations/UUV Operations | | 1 | 120 | None | 0 | | | | | | | | | | | | |
| 11 | MK8 Marine Mammal/MMS Operations | | 1 | 175 | None | 0 | | | | | | | | | | | | |
| 12 | Mine Neutralization | | 1 | 4 | SH-60 - 2 Hours | 1 | 2.0 | 1200.0 | 2400.0 | 21.10 | 0.00 | 0.00 | 7131.84 | 0.20 | 0.23 | 57054.68952 | 1.6096934 | 1.8481665 |
| **1.4.6** | **Conduct Maritime Interception** | | | | | | | | | | | | | | | | | |
| 13 | Visit, Board, Search and Seizure | | 1 | 30 | None | 0 | | | | | | | | | | | | |
| **1.5.4** | **Conduct Amphibious Operations** | | | | | | | | | | | | | | | | | |
| 14 | Small Boat Handling | | 1 | 94 | None | 0 | | | | | | | | | | | | |
| 15 | Swimmer Conditioning - Bay and Ocean with fins | | 1 | 189 | None | 0 | | | | | | | | | | | | |
| 16 | Basic Reconnaissance Course Final Mission | | 1 | 8 | SH60 | 1 | 4.0 | 1200.0 | 4800.0 | 21.10 | 0.00 | 0.00 | 14263.67 | 0.40 | 0.46 | 456437.5162 | 12.877547 | 14.785332 |
| 17 | Obstacle Course | | 1 | 138 | None | 0 | | | | | | | | | | | | |
| 18 | Hydrographic Reconnaissance | | 1 | 40 | None | 0 | | | | | | | | | | | | |
| 19 | Surf Observations (SUROBS) | | 1 | 116 | None | 0 | | | | | | | | | | | | |
| 20 | CRRC Inflatable Boat Small (IBS)/Surf Passage/Boat Team Organization and Function | | 1 | 72 | None | 0 | | | | | | | | | | | | |
| 21 | CRRC Towing and High Speed Maneuver | | 1 | 8 | None | 0 | | | | | | | | | | | | |
| 22 | CRRC Bay Landing Craft Utility (LCU) Launch and Recover - Bay and Ocean | | 1 | 24 | None | 0 | | | | | | | | | | | | |
| 23 | CRRC Navigation, Bay and Ocean Runs | | 1 | 26 | None | 0 | | | | | | | | | | | | |
| 24 | Amphibious Raid Course Final Mission | | 1 | 24 | None | 0 | | | | | | | | | | | | |
| 25 | Amphibious Raid Operations | | 3 | 2 | CH-53E | 3 | 4.0 | 4464.0 | 17856.0 | 21.10 | 0.00 | 0.00 | 53060.86 | 1.50 | 1.72 | 1273460.67 | 35.928357 | 41.251077 |
| | | | | | CH-46E | 4 | 4.0 | 1120.0 | 4480.0 | 21.10 | 0.00 | 0.00 | 13312.76 | 0.38 | 0.43 | 426008.3484 | 12.019044 | 13.799643 |
| | | | | | CH-53E T&G | 3 | 1.0 | 274.0 | 274.0 | 21.10 | 0.00 | 0.00 | 814.22 | 0.02 | 0.03 | 4885.30779 | 0.13783 | 0.1582493 |
| | | | | | CH-46E T&G | 4 | 1.0 | 97.0 | 97.0 | 21.10 | 0.00 | 0.00 | 288.25 | 0.01 | 0.01 | 2305.960368 | 0.0650584 | 0.0746967 |
| | | | | | UH-1N | 1 | 4.0 | 692.0 | 2768.0 | 21.10 | 0.00 | 0.00 | 8225.38 | 0.23 | 0.27 | 65803.07525 | 1.8565131 | 2.1315521 |
| 26 | Direct Action (DA) Operations | | 3 | 2 | CH-46E | 7 | 4.0 | 1120.0 | 4480.0 | 21.10 | 0.00 | 0.00 | 13312.76 | 0.38 | 0.43 | 745514.6097 | 21.033328 | 24.149376 |
| | | | | | UH-1N | 1 | 4.0 | 692.0 | 2768.0 | 21.10 | 0.00 | 0.00 | 8225.38 | 0.23 | 0.27 | 65803.07525 | 1.8565131 | 2.1315521 |
| 27 | Craft Landing Zone (CLZ) | | 1 | 4 | None | 0 | | | | | | | | | | | | |
| **1.5.7** | **Conduct Naval Special Warfare** | | | | | | | | | | | | | | | | | |
| 28 | Swimmer/Combat Rubber Raiding Craft Over-the-Beach | | 4 | 52 | SH-60 Helo | 1 | 1.0 | 1200.0 | 1200.0 | 21.10 | 0.00 | 0.00 | 3565.92 | 0.10 | 0.12 | 741710.9638 | 20.926015 | 24.026165 |
| 29 | Over-the-Beach Stalk | | 1 | 16 | SH-60 Helo | 1 | 1.0 | 1200.0 | 1200.0 | 21.10 | 0.00 | 0.00 | 3565.92 | 0.10 | 0.12 | 57054.68952 | 1.6096934 | 1.8481665 |
| 30 | Immediate Action Drills | | 1 | 8 | SH-60 Helo | 1 | 1.0 | 1200.0 | 1200.0 | 21.10 | 0.00 | 0.00 | 3565.92 | 0.10 | 0.12 | 28527.34476 | 0.8048467 | 0.9240833 |
| 31 | Breacher Training | | 1 | 20 | None | | | | | | | | | | | | | |
| 32 | Amphibious Warfare Exercise | | 1 | 50 | None | | | | | | | | | | | | | |
| 33 | Mobility Primary Mission Area | | 1 | 200 | None | | | | | | | | | | | | | |
| 34 | Escape and Evasion | | 1 | 20 | None | | | | | | | | | | | | | |
| **2.2.3** | **Perform Tactical Reconnaissance and Surveillance** | | | | | | | | | | | | | | | | | |
| 35 | Helicopter Rope Suspension Training/Cast & Recovery Operation | | 1 | 124 | SH60 | 1 | 1.0 | 1200.0 | 1200.0 | 21.10 | 0.00 | 0.00 | 3565.92 | 0.10 | 0.12 | 442173.8438 | 12.475124 | 14.323291 |
| | | | 1 | 124 | CH46 | 1 | 1.0 | 1120.0 | 1120.0 | 21.10 | 0.00 | 0.00 | 3328.19 | 0.09 | 0.11 | 412695.5875 | 11.643449 | 13.368405 |
| 36 | Rappel and Fast Rope Training | | 1 | 6 | NONE | 0 | | | | | | | | | | | | |
| 37 | SEAL Delivery Vehicle (SDV)/Advanced Seal Delivery System (ASDS) Certification to Deploy | | 14 | 14 | SH-60 | 1 | 1.0 | 1200.0 | 1200.0 | 21.10 | 0.00 | 0.00 | 3565.92 | 0.10 | 0.12 | 698919.9466 | 19.718745 | 22.64004 |
| **4.5.6** | **Construct, Maintain, and Operate Logistics Over-the-Shore** | | | | | | | | | | | | | | | | | |
| 38 | OPDS | | 25 | 6 | None | 0 | | | | | | | | | | | | |
| 39 | Amphibious Bulk Liquid Transfer System (ABLTS) | | 10 | 4 | None | 0 | | | | | | | | | | | | |
| 40 | Barge Ferry/Causeway Coxswain Training | | 3 | 34 | None | 0 | | | | | | | | | | | | |
| 41 | Causeway Pier Insertion and Retraction | | 5 | 9 | None | 0 | | | | | | | | | | | | |
| 42 | Elevated Causeway System (ELCAS) | | 10 | 2 | None | 0 | | | | | | | | | | | | |
| 43 | Establish Beach Party Command Post | | 4 | 16 | None | 0 | | | | | | | | | | | | |
| 44 | Sterngate Marriage to Amphibious Ship/LCU | | 1 | 40 | None | 0 | | | | | | | | | | | | |
| 45 | LCU/LCM Beaching | | 1 | 60 | None | 0 | | | | | | | | | | | | |
| 46 | LCU/LCM Towing/Being Towed | | 1 | 60 | None | 0 | | | | | | | | | | | | |
| 47 | Communications Training | | 2 | 1 | None | 0 | | | | | | | | | | | | |
| 48 | Field Training Exercise with a Beach Camp | | 14 | 1 | None | 0 | | | | | | | | | | | | |
| 49 | Maritime Pre-positioning Ships (MPS) Offload | | 5 | 1 | None | 0 | | | | | | | | | | | | |
| 50 | Reverse Osmosis Water Purification Unit | | 4 | 4 | None | 0 | | | | | | | | | | | | |
| 51 | Roll-on/Roll-off Discharge Facility | | 5 | 1 | None | 0 | | | | | | | | | | | | |
| 52 | MPF Utility Boat Operator Course | | 9 | 2 | None | 0 | | | | | | | | | | | | |

Table C-6
Aircraft GHG Emissions
No Action Alternative

| Scenario | Type Training | Reference | Days (a) | Operations (b) | Aircraft | Number | Aircraft Time on Range (hrs) | Aircraft Fuel Use per hour | Total Fuel Use | Emissions Factors (lb/gallon fuel) (c) | | | Emissions Factors (lb/operation) (c) | | | Emissions (lbs) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | CO2 | CH4 | N2O | CO2 | CH4 | N2O | CO2 | CH4 | N2O |
| 53 | LARC V Operator Training | | 6 | 1 | None | 0 | | | | | | | | | | | | |
| **4.9.1** | **Conduct Mission Area Training** | | | | | | | | | | | | | | | | | |
| | **NSW Diving and Beach Operations** | | | | | | | | | | | | | | | | | |
| 54 | Lung Automatic Rebreather (LAR) V Closed Circuit Breathing Diving | | 1 | 126 | None | 0 | | | | | | | | | | | | |
| 55 | Open Circuit Breathing Diving | | 1 | 12 | None | 0 | | | | | | | | | | | | |
| 56 | OTB Field Training Exercise | | 5 | 36 | None | 0 | | | | | | | | | | | | |
| 57 | Rock Portage | | 1 | 18 | None | 0 | | | | | | | | | | | | |
| | **NSW Land Warfare** | | | | | | | | | | | | | | | | | |
| 58 | Land Patrolling | | 1 | 18 | None | 0 | | | | | | | | | | | | |
| 59 | Immediate Action Drills | | 1 | 5 | None | 0 | | | | | | | | | | | | |
| | **NSW Advanced Training** | | | | | | | | | | | | | | | | | |
| 60 | Over the Beach Insertion / Photo Reconnaissance | | 1 | 31 | None | 0 | | | | | | | | | | | | |
| 61 | Photo Image Capture | | 14 | 3 | None | 0 | | | | | | | | | | | | |
| 62 | Field Skills (Observation Drill, Sketching, Range Estimation) | | 1 | 22 | None | 0 | | | | | | | | | | | | |
| 63 | Stalking, Movement and Hide-Sites | | 5 | 8 | None | 0 | | | | | | | | | | | | |
| 64 | CQC/CQD | | 1 | 109 | SH-60 | 1 | 3.0 | 1200.0 | 3600.0 | 21.10 | 0.00 | 0.00 | 10697.75 | 0.30 | 0.35 | 3499506.351 | 469.29433 | 265.91571 |
| 65 | Communications | | 5 | 6 | None | 0 | | | | | | | | | | | | |
| 66 | Unmanned Aerial Vehicle (UAV) Training | | 5 | 12 | UAV | 2 | | | | | | | | | | | | |
| 67 | Around the World Training | | 1 | 6 | None | 0 | | | | | | | | | | | | |
| **4.9.4** | **Provide/Execute Training for U.S. and Other Nation Units and Individuals** | | | | | | | | | | | | | | | | | |
| | **NSW Physical Fitness Training** | | | | | | | | | | | | | | | | | |
| 68 | Physical Training Runs | | 1 | 464 | None | 0 | | | | | | | | | | | | |
| 69 | Physical Conditioning Training Exercise | | 1 | 280 | None | 0 | | | | | | | | | | | | |
| 70 | Swim Training | | 1 | 170 | None | 0 | | | | | | | | | | | | |
| 71 | Hell Week | | 5 | 6 | None | 0 | | | | | | | | | | | | |
| 72 | Rucksack March | | 1 | 54 | None | 0 | | | | | | | | | | | | |
| 73 | Monster Mash | | 1 | 6 | None | 0 | | | | | | | | | | | | |
| **4.12.6** | **Provide Industrial and Environmental Health Services** | | | | | | | | | | | | | | | | | |
| 74 | Conduct Environmental Health Site Assessment | | 3 | 3 | None | 0 | | | | | | | | | | | | |
| **6.1.1** | **Conduct Explosive Ordnance Disposal** | | | | | | | | | | | | | | | | | |
| 75 | Conventional Ordnance/Improvised Explosive Device Response | | 1 | 64 | None | | | | | | | | | | | | | |
| 76 | Land Mine Detection/Neutralization | | 1 | 24 | None | | | | | | | | | | | | | |
| **6.3.1** | **Force Protection: Protect and Secure Area of Operations** | | | | | | | | | | | | | | | | | |
| 77 | Field Training Exercise (FTX) e.g. SEAHAWK | | 14 | 53 | None | 0 | | | | | | | | | | | | |
| **6.3.3** | **Combat Terrorism** | | | | | | | | | | | | | | | | | |
| 78 | Small Boat Attack | | 1 | 30 | None | 0 | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | **10218801.48** | **658.8669185** | **483.573129** |
| | | | | | | | | | | | | | **Emissions, short tons/year** | | | **5109.40** | **0.33** | **0.24** |
| | | | | | | | | | | | | | **Emissions, metric tons/year** | | | **4635.22** | **0.30** | **0.22** |

Assumptions: Assume that SH-60 and CH-46 operation for Cast and Recovery are Special Personnel Insertion and Extraction Rig operations.
Assume 4 hours of cruise time for Amphibious Raid Operations, and one touch and go operation
SH60 from AESO Memorandum Report No. 9929, February 1999
CH53 from AESO Memorandum Report No. 9822 Rev C, February 2000
CH46 from AESO Memorandum Report No. 9816 Rev F, January 2001
UH1N from AESO Memorandum Report No. 9904 Rev A, May 1999
AH-1W from AESO Memorandum Report No. 9824 Rev A, April 1999
Assume Aircraft participate for one day during Amphibious Raid Operations and Direct Action Operations
Assume 1 LTO and 3 hours of cruise for CQC/CQD SH-60 operation.
(a) Days = the number of days per operation
(b) Operations = the number of operations per year

| Scenario | Type Training | Reference | Days (a) | Operations (b) | Ship/Boat Type | Number | Ship Time on Range (hrs) (e) | Engines and Generators | | | | Ave. Speed (Knots) | Power Level (%) or horsepower | Engines on Line | Generator - Load (kW) | Ship hp | Ship Load Factor | kW | Fuel Use, g/kWh | Fuel Use, gallons/hr | Emissions Factors (lb/hour) | | | Emissions, (lbs/year) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Hours | Propulsion | No. | Generator | No. | | | | | | | | | | CO2 | CH4 | N2O | CO2 | CH4 | N2O |
| **1.1.2** | **Conduct Maneuver - Move Forces** | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | Anchoring | | 1 | 72 | RHIB | 1 | 4 | Caterpillar 3126 Diesels | 2 | None | 0 | 1-2 | 600 | 2 | NA | 940 | 100% | 700.958 | 220 | 48 | 1070.714 | 0.1 | 0.0 | 308365.67 | 22.48183 | 7.899022 |
| | | | 1 | 72 | Ship (DDG or CG) | 1 | 4 | GE LM 2500 | 4 | Allison 501-K34, 2,000 kW ea | 3 | 4-6 | 2.5% | 2 | 2@1300kW ea | 104960 | 35% | 78268.67 | 246 | 5980 | 133816.4 | 9.8 | 3.4 | 38539136 | 2809.75 | 987.2094 |
| 2 | Towing | | 1 | 30 | Foss Tug | 1 | 4 | Foster Wheeler/ Babcock & Wilcox | 2 | NA - No separate emissions | 0 | 7 | 25% | 2 | NA | 4000 | 35% | 2982.8 | 246 | 228 | 5099.712 | 0.4 | 0.1 | 611965.44 | 44.6162 | 15.67596 |
| | | | 1 | 30 | Ship (DDG or CG) | 1 | 4 | GE LM 2500 | 4 | Allison 501-K34, 2,000 kW ea | 3 | 4-6 | 2.5% | 2 | 2@1300kW ea | 104960 | 35% | 78268.67 | 246 | 5980 | 133816.4 | 9.8 | 3.4 | 16057973 | 1170.729 | 411.3372 |
| 3 | Moor to Buoy | | 1 | 36 | RHIB | 1 | 4 | Caterpillar 3126 Diesels | 2 | None | 0 | 1-2 | 600 | 2 | NA | 940 | 100% | 700.958 | 220 | 48 | 1070.714 | 0.1 | 0.0 | 154182.84 | 11.24092 | 3.949511 |
| | | | 1 | 36 | Ship (DDG or CG) | 1 | 4 | GE LM 2500 | 4 | Allison 501-K34, 2,000 kW ea | 3 | 4-6 | 2.5% | 2 | 2@1300kW ea | 104960 | 35% | 78268.67 | 246 | 5980 | 133816.4 | 9.8 | 3.4 | 19269568 | 1404.875 | 493.6047 |
| **1.3.1** | **Perform Mine Countermeasures** | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | Parachute Operations | | 1 | 216 | RHIBs | 3 | 4 | Caterpillar 3126 Diesels | 2 | None | 0 | 1-2 | 600 | 2 | NA | 940 | 100% | 700.958 | 220 | 48 | 1070.714 | 0.1 | 0.0 | 2775291 | 202.3365 | 71.0912 |
| 5 | MCM Operations | | 1 | 32 | Zodiacs | 1 | 4 | OMC Outboard, 55 hp (d) | 1 | None | 0 | 2 | 600-800 | 1 | NA | 55 | 100% | 41.0135 | 220 | 3 | 62.64817 | 0.0 | 0.0 | 8018.9654 | 0.584634 | 0.205412 |
| 6 | Floating Mine Operations | | 1 | 25 | RHIBs | 2 | 4 | Caterpillar 3126 Diesels | 2 | None | 0 | 1-2 | 600 | 2 | NA | 940 | 100% | 700.958 | 220 | 48 | 1070.714 | 0.1 | 0.0 | 214142.83 | 15.61238 | 5.485432 |
| 7 | Dive Platoon | | 1 | 8 | RHIB | 2 | 4 | Caterpillar 3126 Diesels | 2 | None | 0 | 1-2 | 600 | 2 | NA | 940 | 100% | 700.958 | 220 | 48 | 1070.714 | 0.1 | 0.0 | 68525.705 | 4.995963 | 1.755338 |
| 8 | Very Shallow Water (VSW) Operator Course | | 8 | 4 | RHIBs / Water-Jet Driven Craft | 2 | 2 | Caterpillar 3126 Diesels | 2 | None | 0 | 1-2 | 600 | 2 | NA | 940 | 100% | 700.958 | 220 | 48 | 1070.714 | 0.1 | 0.0 | 137051.41 | 9.991925 | 3.510676 |
| 9 | VSW Mine Countermeasure Operations | | 1 | 120 | RHIBs / Water-Jet Driven Craft | 3 | 2 | Caterpillar 3126 Diesels | 2 | None | 0 | 1-2 | 600 | 2 | NA | 940 | 100% | 700.958 | 220 | 48 | 1070.714 | 0.1 | 0.0 | 770914.18 | 56.20458 | 19.74756 |
| 10 | Autonomous Underwater Vehicle (AUV) Operations/UUV Operatic | | 1 | 120 | RHIBs / Water-Jet Driven Craft | 2 | 2 | Caterpillar 3126 Diesels | 2 | None | 0 | 1-2 | 600 | 2 | NA | 940 | 100% | 700.958 | 220 | 48 | 1070.714 | 0.1 | 0.0 | 513942.79 | 37.46972 | 13.16504 |
| | | | 1 | 120 | Submersible | 2 | 2 | | | | | | | | | | | | | | | | | | | |
| 11 | MK8 Marine Mammal/MMS Operations | | 1 | 175 | RHIBs / Water-Jet Driven Craft | 4 | 2 | Caterpillar 3126 Diesels | 2 | None | 0 | 1-2 | 600 | 2 | NA | 940 | 100% | 700.958 | 220 | 48 | 1070.714 | 0.1 | 0.0 | 1498999.8 | 109.2867 | 38.39802 |
| 12 | Mine Neutralization | | 1 | 4 | RHIBs / Water-Jet Driven Craft | 2 | 2 | Caterpillar 3126 Diesels | 2 | None | 0 | 1-2 | 600 | 2 | NA | 940 | 100% | 700.958 | 220 | 48 | 1070.714 | 0.1 | 0.0 | 17131.426 | 1.248991 | 0.438835 |
| **1.4.6** | **Conduct Maritime Interception** | | | | | | | | | | | | | | | | | | | | | | | | | |
| 13 | Visit, Board, Search and Seizure | | 1 | 30 | Foss Tug | 1 | 4 | Foster Wheeler/ Babcock & Wilcox | 2 | NA - No separate emissions | 0 | 7 | 25% | 2 | NA | 4000 | 35% | 2982.8 | 246 | 228 | 5099.712 | 0.4 | 0.1 | 611965.44 | 44.6162 | 15.67596 |
| | | | 1 | 30 | RHIB | 1 | 4 | Caterpillar 3126 Diesels | 2 | None | 0 | 1-2 | 600 | 2 | NA | 940 | 100% | 700.958 | 220 | 48 | 1070.714 | 0.1 | 0.0 | 128485.7 | 9.36743 | 3.291259 |
| | | | 1 | 30 | Ship (DDG or CG) | 1 | 4 | GE LM 2500 | 4 | Allison 501-K34, 2,000 kW ea | 3 | 4-6 | 2.5% | 2 | 2@1300kW ea | 104960 | 35% | 78268.67 | 246 | 5980 | 133816.4 | 9.8 | 3.4 | 16057973 | 1170.729 | 411.3372 |
| **1.5.4** | **Conduct Amphibious Operations** | | | | | | | | | | | | | | | | | | | | | | | | | |
| 14 | Small Boat Handling | | 1 | 94 | CRRC | 4 | 6 | OMC Outboard, 55 hp (d) | 1 | None | 0 | 2 | 600-800 | 1 | NA | 55 | 100% | 41.0135 | 220 | 3 | 62.64817 | 0.0 | 0.0 | 141334.27 | 10.30417 | 3.620385 |
| 15 | Swimmer Conditioning - Bay and Ocean with fins | | 1 | 189 | Personal Watercraft / CRRC / RHIB | 1 | 1 | Yamaha Outboard, 160 hp (d) | 1 | None | 0 | 2 | 100% | 1 | NA | 160 | 100% | 119.312 | 220 | 8 | 182.2492 | 0.0 | 0.0 | 34445.102 | 2.511268 | 0.882338 |
| 16 | Basic Reconnaissance Course Final Mission | | 1 | 8 | IBS | 1 | 6 | OMC Outboard, 55 hp (d) | 1 | None | 0 | 2 | 600-800 | 1 | NA | 55 | 100% | 41.0135 | 220 | 3 | 62.64817 | 0.0 | 0.0 | 3007.112 | 0.219238 | 0.077029 |
| | | | 1 | 8 | LCU | 1 | 6 | GM Detroit, V12-71N 460bhp | 2 | 3-71 GM Detroit, 40 kW | 2 | 10 | 2000 rpm (97%) | 2 | 2@ 7kW ea | 460 | 100% | 343.022 | 220 | 23 | 523.9665 | 0.0 | 0.0 | 25150.392 | 1.833625 | 0.644246 |
| 17 | Obstacle Course | | 1 | 138 | None | | | | | | | | | | | | | | | | | | | | | |
| 18 | Hydrographic Reconnaissance | | 1 | 40 | Personal Watercraft | 1 | 6 | Yamaha Outboard, 160 hp (d) | 1 | None | 0 | 2 | 100% | 1 | NA | 160 | 100% | 119.312 | 220 | 8 | 182.2492 | 0.0 | 0.0 | 43739.811 | 3.188912 | 1.120429 |
| | | | 1 | 40 | Small Water Craft | 8 | 6 | OMC Outboard, 55 hp (d) | 1 | None | 0 | 2 | 600-800 | 1 | NA | 55 | 100% | 41.0135 | 220 | 3 | 62.64817 | 0.0 | 0.0 | 120284.48 | 8.769509 | 3.081179 |
| | | | 1 | 40 | RHIB / CRRC | 1 | 6 | Caterpillar 3126 Diesels | 2 | None | 0 | 1-2 | 600 | 2 | NA | 940 | 100% | 700.958 | 220 | 48 | 1070.714 | 0.1 | 0.0 | 256971.39 | 18.73486 | 6.582518 |
| | | | 1 | 40 | rigid, 10-meter craft | 1 | 6 | Caterpillar 3126 Diesels | 2 | None | 0 | 1-2 | 600 | 2 | NA | 940 | 100% | 700.958 | 220 | 48 | 1070.714 | 0.1 | 0.0 | 256971.39 | 18.73486 | 6.582518 |
| 19 | Surf Observations (SUROBS) | | 1 | 116 | None | | | | | | | | | | | | | | | | | | | | | |
| 20 | CRRC Inflatable Boat Small (IBS)/Surf Passage/Boat Team Orga | | 1 | 72 | CRRC/Zodiac/Propeller Surface Craft/RI | 6 | 6 | OMC Outboard, 55 hp (d) | 1 | None | 0 | 2 | 600-800 | 1 | NA | 55 | 100% | 41.0135 | 220 | 3 | 62.64817 | 0.0 | 0.0 | 162384.05 | 11.83884 | 4.159591 |
| | | | 1 | 72 | Personal Watercraft | 1 | 6 | Yamaha Outboard, 160 hp (d) | 1 | None | 0 | 2 | 100% | 1 | NA | 160 | 100% | 119.312 | 220 | 8 | 182.2492 | 0.0 | 0.0 | 78731.661 | 5.740042 | 2.016772 |
| 21 | CRRC Towing and High Speed Maneuver | | 1 | 8 | CRRC | 4 | 6 | OMC Outboard, 55 hp (d) | 1 | None | 0 | 2 | 600-800 | 1 | NA | 55 | 100% | 41.0135 | 220 | 3 | 62.64817 | 0.0 | 0.0 | 12028.448 | 0.876951 | 0.308118 |
| | | | 1 | 8 | Personal Watercraft | 1 | 6 | Yamaha Outboard, 160 hp (d) | 1 | None | 0 | 2 | 100% | 1 | NA | 160 | 100% | 119.312 | 220 | 8 | 182.2492 | 0.0 | 0.0 | 8747.9623 | 0.637782 | 0.224086 |
| 22 | CRRC Bay Landing Craft Utility (LCU) Launch and Recover - Bay | | 1 | 24 | CRRC | 4 | 6 | OMC Outboard, 55 hp (d) | 1 | None | 0 | 2 | 600-800 | 1 | NA | 55 | 100% | 41.0135 | 220 | 3 | 62.64817 | 0.0 | 0.0 | 36085.344 | 2.630853 | 0.924354 |
| | | | 1 | 24 | Personal Watercraft | 1 | 6 | Yamaha Outboard, 160 hp (d) | 1 | None | 0 | 2 | 100% | 1 | NA | 160 | 100% | 119.312 | 220 | 8 | 182.2492 | 0.0 | 0.0 | 26243.887 | 1.913347 | 0.672257 |
| | | | 1 | 24 | RHIB | 1 | 6 | Caterpillar 3126 Diesels | 2 | None | 0 | 1-2 | 600 | 2 | NA | 940 | 100% | 700.958 | 220 | 48 | 1070.714 | 0.1 | 0.0 | 154182.84 | 11.24092 | 3.949511 |
| | | | 1 | 24 | LCU | 1 | 6 | GM Detroit, V12-71N 460bhp | 2 | 3-71 GM Detroit, 40 kW | 2 | 10 | 2000 rpm (97%) | 2 | 2@ 7kW ea | 460 | 100% | 343.022 | 220 | 23 | 523.9665 | 0.0 | 0.0 | 75451.175 | 5.500874 | 1.932739 |

Table C-7
Marine Vessel GHG Emissions
No Action Alternative

| Scenario | Type Training | Reference | Days (a) | Operations (b) | Ship/Boat Type | Number | Ship Time on Range (hrs) (e) | Engines and Generators | | | | Ave. Speed (Knots) | Power Level (%) or horsepower | Engines on Line | Generator - Load (kW) | Ship hp | Ship Load Factor | kW | Fuel Use, g/kWh | Fuel Use, gallons/hr | Emissions Factors (lb/hour) | | | Emissions, (lbs/year) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Hours | Propulsion | No. | Generator | No. | | | | | | | | | | CO2 | CH4 | N2O | CO2 | CH4 | N2O |
| 23 | CRRC Navigation, Bay and Ocean Runs | | 1 | 26 | CRRC | 6 | 6 | OMC Outboard, 55 hp (d) | 1 | None | 0 | 2 | 600-800 | 1 | NA | 55 | 100% | 41.0135 | 220 | 3 | 62.64817 | 0.0 | 0.0 | 58638.685 | 4.275136 | 1.502075 |
| | | | 1 | 26 | RHIB | 1 | 6 | Caterpillar 3126 Diesels | 2 | None | 0 | 1-2 | 600 | 2 | NA | 940 | 100% | 700.958 | 220 | 48 | 1070.714 | 0.1 | 0.0 | 167031.41 | 12.17766 | 4.278637 |
| 24 | Amphibious Raid Course Final Mission | | 1 | 24 | LCU | 2 | 2 | GM Detroit, V12-71N 460bhp | 2 | 3-71 GM Detroit, 40 kW | 2 | 10 | 2000 rpm (97%) | 2 | 2@ 7kW ea | 920 | 100% | 686.044 | 220 | 47 | 1047.933 | 0.1 | 0.0 | 100601.57 | 7.334498 | 2.576986 |
| | | | 1 | 24 | CRRCs | 12 | 2 | OMC Outboard, 55 hp (d) | 1 | None | 0 | 2 | 600-800 | 1 | NA | 55 | 100% | 41.0135 | 220 | 3 | 62.64817 | 0.0 | 0.0 | 36085.344 | 2.630853 | 0.924354 |
| 25 | Amphibious Raid Operations | | 3 | 2 | CRRCs | 13 | 2 | OMC Outboard, 55 hp (d) | 1 | None | 0 | 2 | 600-800 | 1 | NA | 55 | 100% | 41.0135 | 220 | 3 | 62.64817 | 0.0 | 0.0 | 3257.7047 | 0.237508 | 0.083449 |
| | | | 3 | 2 | LPD | 1 | 2 | Foster Wheeler/ Babcock & Wilcox | 2 | NA - No separate emissions | 0 | 7 | 25% | 2 | NA | 4000 | 35% | 2982.8 | 246 | 228 | 5099.712 | 0.4 | 0.1 | 20398.848 | 1.487207 | 0.522532 |
| | | | 3 | 2 | LCUs | 2 | 2 | GM Detroit, V12-71N 460bhp | 2 | 3-71 GM Detroit, 40 kW | 2 | 10 | 2000 rpm (97%) | 2 | 2@ 7kW ea | 920 | 100% | 686.044 | 220 | 47 | 1047.933 | 0.1 | 0.0 | 8383.4639 | 0.611208 | 0.214749 |
| | | | 3 | 2 | LCACs | 2 | 2 | Avco Lycoming TF-40B 3,955 hp each | 4 | APU T-62-T-40-7 Sunstrand 60 kW each | 2 | 35 | 80% | 4 | 2@ 10kW ea | 11820 | 35% | 8814.174 | 246 | 673 | 15069.65 | 1.1 | 0.4 | 120557.19 | 8.789391 | 3.088165 |
| | | | 3 | 2 | EFV | 6 | 2 | | | | | | | | | | | | | | | | | | | |
| 26 | Direct Action (DA) Operations | | 3 | 2 | CRRCs | 9 | 2 | OMC Outboard, 55 hp (d) | 1 | None | 0 | 2 | 600-800 | 1 | NA | 55 | 100% | 41.0135 | 220 | 3 | 62.64817 | 0.0 | 0.0 | 2255.334 | 0.164428 | 0.057772 |
| | | | 3 | 2 | LPD | 1 | 2 | Foster Wheeler/ Babcock & Wilcox | 2 | NA - No separate emissions | 0 | 7 | 25% | 2 | NA | 4000 | 35% | 2982.8 | 246 | 228 | 5099.712 | 0.4 | 0.1 | 20398.848 | 1.487207 | 0.522532 |
| 27 | Craft Landing Zone (CLZ) | | 1 | 4 | 1 LCAC per CLZ | 1 | 2 | Avco Lycoming TF-40B 3,955 hp each | 4 | APU T-62-T-40-7 Sunstrand 60 kW each | 2 | 35 | 80% | 4 | 2@ 10kW ea | 7910 | 35% | 5898.487 | 246 | 451 | 10084.68 | 0.7 | 0.3 | 80677.444 | 5.881902 | 2.066614 |
| **1.5.7** | **Conduct Naval Special Warfare** | | | | | | | | | | | | | | | | | | | | | | | | | |
| 28 | Swimmer/Combat Rubber Raiding Craft Over-the-Beach | | 4 | 52 | RHIBs / CRRCs | 3 | 2 | Caterpillar 3126 Diesels | 2 | None | 0 | 1-2 | 600 | 2 | NA | 940 | 100% | 700.958 | 220 | 48 | 1070.714 | 0.1 | 0.0 | 1336251.2 | 97.42127 | 34.2291 |
| | | | 4 | 52 | Rigid, 10-meter craft | 1 | 2 | Caterpillar 3126 Diesels | 2 | None | 0 | 1-2 | 600 | 2 | NA | 940 | 100% | 700.958 | 220 | 48 | 1070.714 | 0.1 | 0.0 | 445417.08 | 32.47376 | 11.4097 |
| 29 | Over-the-Beach Stalk | | 1 | 16 | CRRCs | 1 | 2 | OMC Outboard, 55 hp (d) | 1 | None | 0 | 2 | 600-800 | 1 | NA | 55 | 100% | 41.0135 | 220 | 3 | 62.64817 | 0.0 | 0.0 | 2004.7414 | 0.146158 | 0.051353 |
| | | | 1 | 16 | Boston Whaler | 1 | 2 | OMC Johnson Outboards (d) | 2 | None | 0 | 2-3 | 1000 | 2 | NA | 160 | 100% | 119.312 | 220 | 8 | 182.2492 | 0.0 | 0.0 | 5831.9749 | 0.425188 | 0.14939 |
| 30 | Immediate Action Drills | | 1 | 8 | RHIBs | 1 | 2 | Caterpillar 3126 Diesels | 2 | None | 0 | 1-2 | 600 | 2 | NA | 940 | 100% | 700.958 | 220 | 48 | 1070.714 | 0.1 | 0.0 | 17131.426 | 1.248991 | 0.438835 |
| | | | 1 | 8 | CRRCs | 1 | 2 | OMC Outboard, 55 hp (d) | 1 | None | 0 | 2 | 600-800 | 1 | NA | 55 | 100% | 41.0135 | 220 | 3 | 62.64817 | 0.0 | 0.0 | 1002.3707 | 0.073079 | 0.025676 |
| 31 | Breacher Training | | 1 | 20 | None | 0 | | | | | | | | | | | | | | | | | | | | |
| 32 | Amphibious Warfare Exercise | | 1 | 50 | RHIBs | 2 | 2 | Caterpillar 3126 Diesels | 2 | None | 0 | 1-2 | 600 | 2 | NA | 940 | 100% | 700.958 | 220 | 48 | 1070.714 | 0.1 | 0.0 | 214142.83 | 15.61238 | 5.485432 |
| | | | 1 | 50 | MK V | 2 | 2 | MTU 12V 396 TE94, 12 cyl | 2 | Northern Light, M844, 4 cyl 16 kW | 1 | 5-6 | 30% | 1 | 10 kW | 4570 | 100% | 3407.849 | 220 | 233 | 5205.493 | 0.4 | 0.1 | 1041098.6 | 75.90276 | 26.66854 |
| 33 | Mobility Primary Mission Area | | 1 | 200 | RHIB or MK V | 4 | 2 | Caterpillar 3126 Diesels | 2 | None | 0 | 1-2 | 600 | 2 | NA | 940 | 100% | 700.958 | 220 | 48 | 1070.714 | 0.1 | 0.0 | 1713142.6 | 124.8991 | 43.88346 |
| 34 | Escape and Evasion | | 1 | 20 | RHIBs | 2 | 2 | Caterpillar 3126 Diesels | 2 | None | 0 | 1-2 | 600 | 2 | NA | 940 | 100% | 700.958 | 220 | 48 | 1070.714 | 0.1 | 0.0 | 85657.131 | 6.244953 | 2.194173 |
| | | | 1 | 20 | MK V | 2 | 2 | MTU 12V 396 TE94, 12 cyl | 2 | Northern Light, M844, 4 cyl 16 kW | 1 | 5-6 | 30% | 1 | 10 kW | 4570 | 100% | 3407.849 | 220 | 233 | 5205.493 | 0.4 | 0.1 | 416439.46 | 30.3611 | 10.66741 |
| **2.2.3** | **Perform Tactical Reconnaissance and Surveillance** | | | | | | | | | | | | | | | | | | | | | | | | | |
| 35 | Helicopter Rope Suspension Training/Cast & Recovery Operation | | 1 | 124 | RHIBs | 1 | 2 | Caterpillar 3126 Diesels | 2 | None | 0 | 1-2 | 600 | 2 | NA | 940 | 100% | 700.958 | 220 | 48 | 1070.714 | 0.1 | 0.0 | 265537.11 | 19.35936 | 6.801936 |
| | | | 1 | 124 | CRRCs | 2 | 2 | OMC Outboard, 55 hp (d) | 1 | None | 0 | 2 | 600-800 | 1 | NA | 55 | 100% | 41.0135 | 220 | 3 | 62.64817 | 0.0 | 0.0 | 31073.491 | 2.265456 | 0.795971 |
| 36 | Rappel and Fast Rope Training | | 1 | 6 | None | | | | | | | | | | | | | | | | | | | | | |
| 37 | SEAL Delivery Vehicle (SDV)/Advanced Seal Delivery System (AS | | 14 | 14 | RHIBs | 2 | 2 | Caterpillar 3126 Diesels | 2 | None | 0 | 1-2 | 600 | 2 | NA | 940 | 100% | 700.958 | 220 | 48 | 1070.714 | 0.1 | 0.0 | 839439.88 | 61.20054 | 21.50289 |
| **4.5.6** | **Construct, Maintain, and Operate Logistics Over-the-Shore** | | | | | | | | | | | | | | | | | | | | | | | | | |
| 38 | OPDS | | 25 | 6 | OUBs | 2 | 4 | GM Detroit, V12-71N 460bhp | 2 | 3-71 GM Detroit, 40 kW | 2 | 10 | 2000 rpm (97%) | 2 | 2@ 7kW ea | 1840 | 100% | 1372.088 | 220 | 94 | 2095.866 | 0.2 | 0.1 | 2515039.2 | 183.3625 | 64.42465 |
| 39 | Amphibious Bulk Liquid Transfer System (ABLTS) | | 10 | 4 | Warping Tug | 1 | 4 | Foster Wheeler/ Babcock & Wilcox | 2 | NA - No separate emissions | 0 | 7 | 25% | 2 | NA | 4000 | 35% | 2982.8 | 246 | 228 | 5099.712 | 0.4 | 0.1 | 815953.92 | 59.48827 | 20.90128 |
| | | | 10 | 4 | Barge Ferry | 2 | 4 | Foster Wheeler/ Babcock & Wilcox | 2 | NA - No separate emissions | 0 | 7 | 25% | 2 | NA | 4000 | 35% | 2982.8 | 246 | 228 | 5099.712 | 0.4 | 0.1 | 1631907.8 | 118.9765 | 41.80257 |
| 40 | Barge Ferry/Causeway Coxswain Training | | 3 | 34 | Barge Ferry | 2 | 4 | Foster Wheeler/ Babcock & Wilcox | 2 | NA - No separate emissions | 0 | 7 | 25% | 2 | NA | 4000 | 35% | 2982.8 | 246 | 228 | 5099.712 | 0.4 | 0.1 | 4161365 | 303.3902 | 106.5965 |
| 41 | Causeway Pier Insertion and Retraction | | 5 | 9 | WTs | 4 | 4 | Foster Wheeler/ Babcock & Wilcox | 2 | NA - No separate emissions | 0 | 7 | 25% | 2 | NA | 4000 | 35% | 2982.8 | 246 | 228 | 5099.712 | 0.4 | 0.1 | 3671792.7 | 267.6972 | 94.05577 |
| 42 | Elevated Causeway System (ELCAS) | | 10 | 2 | WTs | 2 | 4 | Foster Wheeler/ Babcock & Wilcox | 2 | NA - No separate emissions | 0 | 7 | 25% | 2 | NA | 4000 | 35% | 2982.8 | 246 | 228 | 5099.712 | 0.4 | 0.1 | 815953.92 | 59.48827 | 20.90128 |
| | | | 10 | 2 | Personal Watercraft | 2 | 4 | Yamaha Outboard, 160 hp (d) | 1 | None | 0 | 2 | 100% | 1 | NA | 160 | 100% | 119.312 | 220 | 8 | 182.2492 | 0.0 | 0.0 | 29159.874 | 2.125942 | 0.746952 |
| | | | 10 | 2 | LCM | 1 | 4 | GM Detroit, V12-71N 460bhp | 2 | 3-71 GM Detroit, 40 kW | 2 | 10 | 2000 rpm (97%) | 2 | 2@ 7kW ea | 1840 | 100% | 1372.088 | 220 | 94 | 2095.866 | 0.2 | 0.1 | 167669.28 | 12.22416 | 4.294977 |
| 43 | Establish Beach Party Command Post | | 4 | 16 | None | | | | | | | | | | | | | | | | | | | | | |

| Scenario | Type Training | Reference | Days (a) | Operations (b) | Ship/Boat Type | Number | Ship Time on Range (hrs) (e) | Engines and Generators | | | | Ave. Speed (Knots) | Power Level (%) or horsepower | Engines on Line | Generator - Load (kW) | Ship hp | Ship Load Factor | kW | Fuel Use, g/kWh | Fuel Use, gallons/hr | Emissions Factors (lb/hour) | | | Emissions, (lbs/year) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Hours | Propulsion | No. | Generator | No. | | | | | | | | | | CO2 | CH4 | N2O | CO2 | CH4 | N2O |
| 44 | Sterngate Marriage to Amphibious Ship/LCU | | 1 | 40 | LCU | 2 | 4 | GM Detroit, V12-71N 460bhp | 2 | 3-71 GM Detroit, 40 kW | 2 | 10 | 2000 rpm (97%) | 2 | 2@ 7kW ea | 1840 | 100% | 1372.088 | 220 | 94 | 2095.866 | 0.2 | 0.1 | 670677.11 | 48.89666 | 17.17991 |
| 45 | LCU/LCM Beaching | | 1 | 60 | LCU | 1 | 4 | GM Detroit, V12-71N 460bhp | 2 | 3-71 GM Detroit, 40 kW | 2 | 10 | 2000 rpm (97%) | 2 | 2@ 7kW ea | 1840 | 100% | 1372.088 | 220 | 94 | 2095.866 | 0.2 | 0.1 | 503007.83 | 36.67249 | 12.88493 |
| | | | 1 | 60 | LCM-8 | 1 | 4 | GM Detroit, V12-71N 460bhp | 2 | 3-71 GM Detroit, 40 kW | 2 | 10 | 2000 rpm (97%) | 2 | 2@ 7kW ea | 1840 | 100% | 1372.088 | 220 | 94 | 2095.866 | 0.2 | 0.1 | 503007.83 | 36.67249 | 12.88493 |
| 46 | LCU/LCM Towing/Being Towed | | 1 | 60 | LCU | 2 | 4 | GM Detroit, V12-71N 460bhp | 2 | 3-71 GM Detroit, 40 kW | 2 | 10 | 2000 rpm (97%) | 2 | 2@ 7kW ea | 1840 | 100% | 1372.088 | 220 | 94 | 2095.866 | 0.2 | 0.1 | 1006015.7 | 73.34498 | 25.76986 |
| | | | 1 | 60 | LCM-8 | 2 | 4 | GM Detroit, V12-71N 460bhp | 2 | 3-71 GM Detroit, 40 kW | 2 | 10 | 2000 rpm (97%) | 2 | 2@ 7kW ea | 1840 | 100% | 1372.088 | 220 | 94 | 2095.866 | 0.2 | 0.1 | 1006015.7 | 73.34498 | 25.76986 |
| 47 | Communications Training | | 2 | 1 | None | | | | | | | | | | | | | | | | | | | | | |
| 48 | Field Training Exercise with a Beach Camp | | 14 | 1 | None | | | | | | | | | | | | | | | | | | | | | |
| 49 | Maritime Pre-positioning Ships (MPS) Offload | | 5 | 1 | LCM-8 | 2 | 2 | GM Detroit, V12-71N 460bhp | 2 | 3-71 GM Detroit, 40 kW | 2 | 10 | 2000 rpm (97%) | 2 | 2@ 7kW ea | 920 | 100% | 686.044 | 220 | 47 | 1047.933 | 0.1 | 0.0 | 20958.66 | 1.528021 | 0.536872 |
| | | | 5 | 1 | WTs | 2 | 2 | Foster Wheeler/ Babcock & Wilcox | 2 | NA - No separate emissions | 0 | 7 | 25% | 2 | NA | 4000 | 35% | 2982.8 | 246 | 228 | 5099.712 | 0.4 | 0.1 | 101994.24 | 7.436033 | 2.61266 |
| | | | 5 | 1 | Barge Ferry | 2 | 2 | Foster Wheeler/ Babcock & Wilcox | 2 | NA - No separate emissions | 0 | 7 | 25% | 2 | NA | 4000 | 35% | 2982.8 | 246 | 228 | 5099.712 | 0.4 | 0.1 | 101994.24 | 7.436033 | 2.61266 |
| 50 | Reverse Osmosis Water Purification Unit | | 4 | 4 | None | | | | | | | | | | | 4000 | | | | | | | | | | |
| 51 | Roll-on/Roll-off Discharge Facility | | 5 | 1 | WTs | 2 | 2 | Foster Wheeler/ Babcock & Wilcox | 2 | NA - No separate emissions | 0 | 7 | 25% | 2 | NA | 4000 | 35% | 2982.8 | 246 | 228 | 5099.712 | 0.4 | 0.1 | 101994.24 | 7.436033 | 2.61266 |
| | | | 5 | 1 | Personal Watercraft | 2 | 2 | Yamaha Outboard, 160 hp (d) | 1 | None | 0 | 2 | 100% | 1 | NA | 160 | 100% | 119.312 | 220 | 8 | 182.2492 | 0.0 | 0.0 | 3644.9843 | 0.265743 | 0.093369 |
| 52 | MPF Utility Boat Operator Course | | 9 | 2 | MPF Utility Boat | 2 | 4 | Diesel Engines | 2 | None | 0 | 2 | 660 | 2 | NA | 1320 | 100% | 984.324 | 220 | 67 | 1503.556 | 0.1 | 0.0 | 216512.07 | 15.78512 | 5.546122 |
| 53 | LARC V Operator Training | | 6 | 1 | None | | | | | | | | | | | | | | | | | | | | | |
| 4.9.1 | **Conduct Mission Area Training** | | | | | | | | | | | | | | | | | | | | | | | | | |
| | **NSW Diving and Beach Operations** | | | | | | | | | | | | | | | | | | | | | | | | | |
| 54 | Lung Automatic Rebreather (LAR) V Closed Circuit Breathing Divi | | 1 | 126 | RHIBs | 5 | 2 | Caterpillar 3126 Diesels | 2 | None | 0 | 1-2 | 600 | 2 | NA | 940 | 100% | 700.958 | 220 | 48 | 1070.714 | 0.1 | 0.0 | 1349099.8 | 98.35802 | 34.55822 |
| 55 | Open Circuit Breathing Diving | | 1 | 12 | RHIBs | 5 | 2 | Caterpillar 3126 Diesels | 2 | None | 0 | 1-2 | 600 | 2 | NA | 940 | 100% | 700.958 | 220 | 48 | 1070.714 | 0.1 | 0.0 | 128485.7 | 9.36743 | 3.291259 |
| | | | | | LCU | 1 | | | | | | | | | | | | | | | | | | | | |
| 56 | OTB Field Training Exercise | | 5 | 36 | CRRCs | 5 | 2 | assume paddling | | | | | | | | | | | | | | | | | | |
| 57 | Rock Portage | | 1 | 18 | CRRCs | 7 | 2 | assume paddling | | | | | | | | | | | | | | | | | | |
| | | | 1 | 18 | IBS | 9 | 2 | OMC Outboard, 55 hp (d) | 1 | None | 0 | 2 | 600-800 | 1 | NA | 55 | 100% | 41.0135 | 220 | 3 | 62.64817 | 0.0 | 0.0 | 20298.006 | 1.479855 | 0.519949 |
| | **NSW Land Warfare** | | | | | | | | | | | | | | | | | | | | | | | | | |
| 58 | Land Patrolling | | 1 | 18 | None | | | | | | | | | | | | | | | | | | | | | |
| 59 | Immediate Action Drills | | 1 | 5 | None | | | | | | | | | | | | | | | | | | | | | |
| | **NSW Advanced Training** | | | | | | | | | | | | | | | | | | | | | | | | | |
| 60 | Over the Beach Insertion / Photo Reconnaissance | | 1 | 31 | RHIB/CRRC | 1 | 2 | Caterpillar 3126 Diesels | 2 | None | 0 | 1-2 | 600 | 2 | NA | 940 | 100% | 700.958 | 220 | 48 | 1070.714 | 0.1 | 0.0 | 66384.276 | 4.839839 | 1.700484 |
| | | | 1 | 31 | Kayak | 1 | 2 | assume paddling | | | | | | | | | | | | | | | | | | |
| 61 | Photo Image Capture | | 14 | 3 | None | | | | | | | | | | | | | | | | | | | | | |
| 62 | Field Skills (Observation Drill, Sketching, Range Estimation) | | 1 | 22 | None | | | | | | | | | | | | | | | | | | | | | |
| 63 | Stalking, Movement and Hide-Sites | | 5 | 8 | None | | | | | | | | | | | | | | | | | | | | | |
| 64 | CQC/CQD | | 1 | 109 | CRRCs | 5 | 2 | OMC Outboard, 55 hp (d) | 1 | None | 0 | 2 | 600-800 | 1 | NA | 55 | 100% | 41.0135 | 220 | 3 | 62.64817 | 0.0 | 0.0 | 68286.503 | 4.978523 | 1.749211 |
| 65 | Communications | | 5 | 6 | None | | | | | | | | | | | | | | | | | | | | | |
| 66 | Unmanned Aerial Vehicle (UAV) Training | | 5 | 12 | None | | | | | | | | | | | | | | | | | | | | | |
| 67 | Around the World Training | | 1 | 6 | CRRCs | 7 | 2 | assume paddling | | | | | | | | | | | | | | | | | | |
| | | | 1 | 6 | Sea Kayaks | 5 | 2 | assume paddling | | | | | | | | | | | | | | | | | | |
| 4.9.4 | **Provide/Execute Training for U.S. and Other Nation Units and** | | | | | | | | | | | | | | | | | | | | | | | | | |
| | **NSW Physical Fitness Training** | | | | | | | | | | | | | | | | | | | | | | | | | |
| 68 | Physical Training Runs | | 1 | 464 | None | | | | | | | | | | | | | | | | | | | | | |
| 69 | Physical Conditioning Training Exercise | | 1 | 280 | CRRCs / Propeller Surface Craft | 3 | 2 | assume paddling | | | | | | | | | | | | | | | | | | |
| 70 | Swim Training | | 1 | 170 | RHIBs | 5 | 2 | assume paddling | | | | | | | | | | | | | | | | | | |
| 71 | Hell Week | | 5 | 6 | CRRCs | 5 | 2 | OMC Outboard, 55 hp (d) | 1 | None | 0 | 2 | 600-800 | 1 | NA | 55 | 100% | 41.0135 | 220 | 3 | 62.64817 | 0.0 | 0.0 | 18794.45 | 1.370236 | 0.481434 |
| 72 | Rucksack March | | 1 | 54 | None | | | | | | | | | | | | | | | | | | | | | |
| 73 | Monster Mash | | 1 | 6 | CRRCs | 3 | 2 | OMC Outboard, 55 hp (d) | 1 | None | 0 | 2 | 600-800 | 1 | NA | 55 | 100% | 41.0135 | 220 | 3 | 62.64817 | 0.0 | 0.0 | 2255.334 | 0.164428 | 0.057772 |
| 4.12.6 | **Provide Industrial and Environmental Health Services** | | | | | | | | | | | | | | | | | | | | | | | | | |
| 74 | Conduct Environmental Health Site Assessment | | 3 | 3 | None | | | | | | | | | | | | | | | | | | | | | |
| 6.1.1 | **Conduct Explosive Ordnance Disposal** | | | | | | | | | | | | | | | | | | | | | | | | | |
| 75 | Conventional Ordnance/Improvised Explosive Device Response | | 1 | 64 | None | | | | | | | | | | | | | | | | | | | | | |
| 76 | Land Mine Detection/Neutralization | | 1 | 24 | None | | | | | | | | | | | | | | | | | | | | | |
| 6.3.1 | **Force Protection: Protect and Secure Area of Operations** | | | | | | | | | | | | | | | | | | | | | | | | | |
| 77 | Field Training Exercise (FTX) e.g. SEAHAWK | | 14 | 53 | Boston Whalers | 144 | 2 | OMC Johnson Outboards (d) | 2 | None | 0 | 2-3 | 1000 | 2 | NA | 60 | 100% | 44.742 | 220 | 3 | 68.34346 | 0.0 | 0.0 | 19682.915 | 1.435011 | 0.504193 |

| Scenario Type Training | Reference | Days (a) | Operations (b) | Ship/Boat Type | Number | Ship Time on Range (hrs) (e) | Engines and Generators | | | | Ave. Speed (Knots) | Power Level (%) or horsepower | Engines on Line | Generator - Load (kW) | Ship hp | Ship Load Factor | kW | Fuel Use, g/kWh | Fuel Use, gallons/hr | Emissions Factors (lb/hour) | | | Emissions, (lbs/year) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Hours | Propulsion | No. | Generator | No. | | | | | | | | | | CO2 | CH4 | N2O | CO2 | CH4 | N2O |
| **6.3.3 Combat Terrorism** | | | | | | | | | | | | | | | | | | | | | | | | | |
| 78 Small Boat Attack | | 1 | 30 | Boston Whalers | 1 | 2 | OMC Johnson Outboards (d) | 2 | None | 0 | 2-3 | 1000 | 2 | NA | 60 | 100% | 44.742 | 220 | 3 | 68.34346 | 0.0 | 0.0 | 4100.6073 | 0.298961 | 0.10504 |
| | | 1 | 30 | surface vessel dropping anchor and 3 sh | 1 | 2 | | | | | | | | | | | | | | | | | | | |
| | | 1 | 30 | 18' Bayliner | 1 | 2 | OMC Johnson Outboards (d) | 2 | None | 0 | 2-3 | 1000 | 2 | NA | 60 | 100% | 44.742 | 220 | 3 | 68.34346 | 0.0 | 0.0 | 4100.6073 | 0.298961 | 0.10504 |
| | | | | | | | | | | | | | | | | | | | | | | | **125938001** | **9181.6868** | **3225.9981** |
| | | | | | | | | | | | | | | | | | | | | **Emissions, short tons/year** | | | **62969.00** | **4.59** | **1.61** |

Assume marine vessels participate for one day during Amphibious Raid Operations and Direct Action Operations and Seahawk
Assumptions: Watercraft operates 8 hours per day for the days during which the operation occurs

Table C-8
Ground Vehicle GHG Emissions
No Action Alternative

| Scenario | Type Training | Reference | Days (a) | Operations (b) | Ground Vehicles | Number | Engine Load | Hours per day | Horsepower | Emissions Factors (lb/hr) CO2 | Emissions Factors (lb/hr) CH4 | Emissions Factors (lb/hr) N2O | Emissions (lbs) CO2 | Emissions (lbs) CH4 | Emissions (lbs) N2O |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **1.1.2** | **Conduct Maneuver - Move Forces** | | | | | | | | | | | | | | |
| 1 | Anchoring | | 1 | 72 | None | | | | | | | | | | |
| 2 | Towing | | 1 | 30 | None | | | | | | | | | | |
| 3 | Moor to Buoy | | 1 | 36 | None | | | | | | | | | | |
| **1.3.1** | **Perform Mine Countermeasures** | | | | | | | | | | | | | | |
| 4 | Parachute Operations | | 1 | 216 | 4WD Pickups | 2 | | 2 | | 22.71 | 0.00 | 0.00 | 19624.03 | 1.63 | 1.39 |
| 5 | MCM Operations | | 1 | 32 | 4WD Pickups | 2 | | 2 | | 22.71 | 0.00 | 0.00 | 2907.26 | 0.24 | 0.21 |
| 6 | Floating Mine Operations | | 1 | 25 | 4WD Pickups | 1 | | 2 | | 22.71 | 0.00 | 0.00 | 1135.65 | 0.09 | 0.08 |
| 7 | Dive Platoon | | 1 | 8 | None | | | | | | | | | | |
| 8 | Very Shallow Water (VSW) Operator Course | | 8 | 4 | None | | | | | | | | | | |
| 9 | VSW Mine Countermeasure Operations | | 1 | 120 | None | | | | | | | | | | |
| 10 | Autonomous Underwater Vehicle (AUV) Operations/UUV Operatio | | 1 | 120 | None | | | | | | | | | | |
| 11 | MK8 Marine Mammal/MMS Operations | | 1 | 175 | 4WD Pickups | 0 | | 2 | | 22.71 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 12 | Mine Neutralization | | 1 | 4 | 4WD Pickups | 2 | | 2 | | 22.71 | 0.00 | 0.00 | 363.41 | 0.03 | 0.03 |
| **1.4.6** | **Conduct Maritime Interception** | | | | | | | | | | | | | | |
| 13 | Visit, Board, Search and Seizure | | 1 | 30 | None | | | | | | | | | | |
| **1.5.4** | **Conduct Amphibious Operations** | | | | | | | | | | | | | | |
| 14 | Small Boat Handling | | 1 | 94 | HMMWV | 1 | 65% | 3 | 150 | 1.25 | 0.00 | 0.00 | 34448.31 | 3.82 | 0.00 |
| 15 | Swimmer Conditioning - Bay and Ocean with fins | | 1 | 189 | HMMWV | 1 | 65% | 3 | 150 | 1.25 | 0.00 | 0.00 | 69263.09 | 7.68 | 0.00 |
| | | | 1 | 189 | Truck | 1 | 80% | 1 | | 48.21 | 0.00 | 0.03 | 7288.73 | 0.20 | 4.28 |
| 16 | Basic Reconnaissance Course Final Mission | | 1 | 8 | None | | | | | | | | | | |
| 17 | Obstacle Course | | 1 | 138 | 4WD Pickups | 2 | | 2 | | 22.71 | 0.00 | 0.00 | 12537.58 | 1.04 | 0.89 |
| 18 | Hydrographic Reconnaissance | | 1 | 40 | 4WD Pickups | 3 | | 2 | | 22.71 | 0.00 | 0.00 | 5451.12 | 0.45 | 0.39 |
| 19 | Surf Observations (SUROBS) | | 1 | 116 | 4WD Pickups | 2 | | 2 | | 22.71 | 0.00 | 0.00 | 10538.83 | 0.87 | 0.74 |
| 20 | CRRC Inflatable Boat Small (IBS)/Surf Passage/Boat Team Organ | | 1 | 72 | HMMWV/ 4WD P | 2 | 65% | 3 | 150 | 1.25 | 0.00 | 0.00 | 52771.88 | 5.85 | 0.00 |
| 21 | CRRC Towing and High Speed Maneuver | | 1 | 8 | 4WD Pickups / H | 1 | | 2 | | 22.71 | 0.00 | 0.00 | 363.41 | 0.03 | 0.03 |
| 22 | CRRC Bay Landing Craft Utility (LCU) Launch and Recover - Bay a | | 1 | 24 | 4WD Pickups / H | 1 | | 2 | | 22.71 | 0.00 | 0.00 | 1090.22 | 0.09 | 0.08 |
| 23 | CRRC Navigation, Bay and Ocean Runs | | 1 | 26 | 4WD Pickups / H | 1 | | 8 | | 22.71 | 0.00 | 0.00 | 4724.30 | 0.39 | 0.33 |
| 24 | Amphibious Raid Course Final Mission | | 1 | 24 | None | 0 | | | | | | | | | |
| 25 | Amphibious Raid Operations | | 3 | 2 | HMMWVs | 6 | 65% | 3 | 150 | 1.25 | 0.00 | 0.00 | 13192.97 | 1.46 | 0.00 |
| | | | 3 | 2 | 4WD Pickups | 8 | | 8 | | 22.71 | 0.00 | 0.00 | 8721.79 | 0.72 | 0.62 |
| | | | 3 | 2 | AAVs | 6 | | 2 | | 180.277 | 0.0 | 0.0 | 12979.94 | 0.95 | 0.33 |
| | | | 3 | 2 | LAVs | 6 | 65% | 2 | 150.0 | 1.25 | 0.00 | 0.00 | 8795.31 | 0.98 | 0.00 |
| | | | 3 | 2 | IFAVs | 6 | 65% | 2 | 150.0 | 1.25 | 0.00 | 0.00 | 8795.31 | 0.98 | 0.00 |
| 26 | Direct Action (DA) Operations | | 3 | 2 | Light Wheeled V | 16 | | 2 | | 22.71 | 0.00 | 0.00 | 4360.90 | 0.36 | 0.31 |
| 27 | Craft Landing Zone (CLZ) | | 1 | 4 | HMMWVs | 1 | 65% | 3 | 150 | 1.25 | 0.00 | 0.00 | 1465.89 | 0.16 | 0.00 |
| **1.5.7** | **Conduct Naval Special Warfare** | | | | | | | | | | | | | | |
| 28 | Swimmer/Combat Rubber Raiding Craft Over-the-Beach | | 4 | 52 | 4WD Pickups | 3 | | 2 | | 22.71 | 0.00 | 0.00 | 28345.82 | 2.35 | 2.00 |
| 29 | Over-the-Beach Stalk | | 1 | 16 | 4WD Pickups | 1 | | 2 | | 22.71 | 0.00 | 0.00 | 726.82 | 0.06 | 0.05 |
| 30 | Immediate Action Drills | | 1 | 8 | 4WD Pickups | 4 | | 2 | | 22.71 | 0.00 | 0.00 | 1453.63 | 0.12 | 0.10 |
| 31 | Breacher Training | | 1 | 20 | 4WD Pickups | 3 | | 2 | | 22.71 | 0.00 | 0.00 | 2725.56 | 0.23 | 0.19 |
| 32 | Amphibious Warfare Exercise | | 1 | 50 | None | 0 | | | | | | | | | |
| 33 | Mobility Primary Mission Area | | 1 | 200 | None | 0 | | | | | | | | | |
| 34 | Escape and Evasion | | 1 | 20 | None | 0 | | | | | | | | | |
| **2.2.3** | **Perform Tactical Reconnaissance and Surveillance** | | | | | | | | | | | | | | |
| 35 | Helicopter Rope Suspension Training/Cast & Recovery Operation | | 1 | 124 | 4WD Pickups | 2 | | 2 | | 22.71 | 0.00 | 0.00 | 11265.65 | 0.93 | 0.80 |
| 36 | Rappel and Fast Rope Training | | 1 | 6 | 4WD Pickups | 4 | | 2 | | 22.71 | 0.00 | 0.00 | 1090.22 | 0.09 | 0.08 |

Table C-8
Ground Vehicle GHG Emissions
No Action Alternative

| Scenario | Type Training | Reference | Days (a) | Operations (b) | Ground Vehicles | Number | Engine Load | Hours per day | Horsepower | Emissions Factors (lb/hr) | | | Emissions (lbs) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | CO2 | CH4 | N2O | CO2 | CH4 | N2O |
| 37 | SEAL Delivery Vehicle (SDV)/Advanced Seal Delivery System (AS | | 14 | 14 | 4WD Pickups | 2 | | 2 | | 22.71 | 0.00 | 0.00 | 17806.99 | 1.48 | 1.26 |
| **4.5.6** | **Construct, Maintain, and Operate Logistics Over-the-Shore** | | | | | | | | | | | | | | |
| 38 | OPDS | | 25 | 6 | HMMWVs | 1 | 65% | 3 | 150 | 1.25 | 0.00 | 0.00 | 54970.71 | 6.09 | 0.00 |
| | | | 25 | 6 | 5-ton truck | 1 | 80% | 1 | | 48.21 | 0.00 | 0.03 | 5784.70 | 0.15 | 3.40 |
| | | | 25 | 6 | Dozer | 2 | 59% | 8 | 240.0 | 1.25 | 0.00 | 0.00 | 425783.36 | 47.20 | 0.00 |
| | | | 25 | 6 | Comm Van | 1 | | 8 | | 22.71 | 0.00 | 0.00 | 27255.60 | 2.26 | 1.93 |
| | | | 25 | 6 | RTV forklift | 1 | 48% | 8 | 93.0 | 1.25 | 0.00 | 0.00 | 66415.89 | 7.36 | 0.00 |
| | | | 25 | 6 | LARCV | 2 | | 2 | 350.0 | 10.85 | 2.338 | 0.879935 | 6510.00 | 1402.80 | 527.96 |
| 39 | Amphibious Bulk Liquid Transfer System (ABLTS) | | 10 | 4 | HMMWVs | 1 | 65% | 3 | 150 | 1.25 | 0.00 | 0.00 | 14658.85 | 1.63 | 0.00 |
| | | | 10 | 4 | 5-ton truck | 1 | 80% | 1 | | 48.21 | 0.00 | 0.03 | 1542.59 | 0.04 | 0.91 |
| | | | 10 | 4 | Van | 1 | | 8 | | 22.71 | 0.00 | 0.00 | 7268.16 | 0.60 | 0.51 |
| | | | 10 | 4 | Dozers | 2 | 59% | 8 | 240.0 | 1.25 | 0.00 | 0.00 | 113542.23 | 12.59 | 0.00 |
| | | | 10 | 4 | Rough Terrain F | 1 | 48% | 8 | 37.0 | 1.25 | 0.00 | 0.00 | 7120.44 | 0.79 | 0.00 |
| | | | 10 | 4 | LARCV | 2 | | 2 | 350.0 | 10.85 | 2.338 | 0.879935 | 1736.00 | 374.08 | 140.79 |
| 40 | Barge Ferry/Causeway Coxswain Training | | 3 | 34 | HMMWVs | 1 | 65% | 3 | 150 | 1.25 | 0.00 | 0.00 | 37380.08 | 4.14 | 0.00 |
| | | | 3 | 34 | 5-ton truck | 1 | 80% | 1 | | 48.21 | 0.00 | 0.03 | 3933.60 | 0.11 | 2.31 |
| | | | 3 | 34 | Van | 1 | | 8 | | 22.71 | 0.00 | 0.00 | 18533.81 | 1.54 | 1.31 |
| | | | 3 | 34 | Dozer | 2 | 59% | 8 | 240.0 | 1.25 | 0.00 | 0.00 | 289532.68 | 32.10 | 0.00 |
| | | | 3 | 34 | LARCV | 2 | | 2 | 350.0 | 10.85 | 2.338 | 0.879935 | 4426.80 | 953.90 | 359.01 |
| 41 | Causeway Pier Insertion and Retraction | | 5 | 9 | HMMWVs | 2 | 65% | 3 | 150 | 1.25 | 0.00 | 0.00 | 32982.42 | 3.66 | 0.00 |
| | | | 5 | 9 | 5-ton truck | 1 | 80% | 1 | | 48.21 | 0.00 | 0.03 | 1735.41 | 0.05 | 1.02 |
| | | | 5 | 9 | Van | 1 | | 8 | | 22.71 | 0.00 | 0.00 | 8176.68 | 0.68 | 0.58 |
| | | | 5 | 9 | Rough Terrain F | 1 | 48% | 8 | 37.0 | 1.25 | 0.00 | 0.00 | 8010.50 | 0.89 | 0.00 |
| | | | 5 | 9 | Dozers | 2 | 59% | 8 | 240.0 | 1.25 | 0.00 | 0.00 | 127735.01 | 14.16 | 0.00 |
| | | | 5 | 9 | LARCV | 2 | | 2 | 350.0 | 10.85 | 2.338 | 0.879935 | 1953.00 | 420.84 | 158.39 |
| 42 | Elevated Causeway System (ELCAS) | | 10 | 2 | HMMWVs | 4 | 65% | 3 | 150 | 1.25 | 0.00 | 0.00 | 29317.71 | 3.25 | 0.00 |
| | | | 10 | 2 | 5-ton truck | 3 | 80% | 1 | | 48.21 | 0.00 | 0.03 | 2313.88 | 0.06 | 1.36 |
| | | | 10 | 2 | Light Trucks | 4 | 62% | 8 | 161.0 | 1.25 | 0.00 | 0.00 | 80040.86 | 8.87 | 0.00 |
| | | | 10 | 2 | Dozers | 2 | 59% | 8 | 240.0 | 1.25 | 0.00 | 0.00 | 56771.11 | 6.29 | 0.00 |
| | | | 10 | 2 | Forklifts | 1 | 48% | 8 | 37.0 | 1.25 | 0.00 | 0.00 | 3560.22 | 0.39 | 0.00 |
| | | | 10 | 2 | 75-Ton Crane | 2 | 74% | 8 | 194.0 | 1.25 | 0.00 | 0.00 | 57556.93 | 6.38 | 0.00 |
| | | | 10 | 2 | Pile Driver | 2 | 30% | 24 | 20.0 | 1.25 | 0.00 | 0.00 | 7216.67 | 0.80 | 0.00 |
| | | | 10 | 2 | ambulance | 1 | | 8 | | 22.71 | 0.00 | 0.00 | 3634.08 | 0.30 | 0.26 |
| | | | 10 | 2 | water buffalo | 1 | 80% | 1 | | 48.21 | 0.00 | 0.03 | 771.29 | 0.02 | 0.45 |
| | | | 10 | 2 | 140-ton crane | 1 | 74% | 8 | 399.0 | 1.25 | 0.00 | 0.00 | 59188.70 | 6.56 | 0.00 |
| | | | 10 | 2 | 30-ton crane | 2 | 74% | 8 | 194.0 | 1.25 | 0.00 | 0.00 | 57556.93 | 6.38 | 0.00 |
| | | | 10 | 2 | LARCV | 2 | | 2 | 350.0 | 10.85 | 2.338 | 0.879935 | 868.00 | 187.04 | 70.39 |
| | | | 10 | 2 | Air compressors | 2 | 48% | 8 | 106.0 | 1.25 | 0.00 | 0.00 | 20399.11 | 2.26 | 0.00 |
| | | | 10 | 2 | Pile Extractor | 1 | 30% | 24 | 20.0 | 1.25 | 0.00 | 0.00 | 3608.33 | 0.40 | 0.00 |
| 43 | Establish Beach Party Command Post | | 4 | 16 | HMMWVs | 3 | 65% | 3 | 150 | 1.25 | 0.00 | 0.00 | 70362.50 | 7.80 | 0.00 |
| | | | 4 | 16 | 5-ton truck | 1 | 80% | 1 | | 48.21 | 0.00 | 0.03 | 2468.14 | 0.07 | 1.45 |
| | | | 4 | 16 | Dozer | 1 | 59% | 8 | 240.0 | 1.25 | 0.00 | 0.00 | 90833.78 | 10.07 | 0.00 |
| | | | 4 | 16 | Generators/vario | 2 | 30% | 24 | Various | 2064.95 | 0.00 | 5.28 | 951528.96 | 0.00 | 2433.02 |
| | | | 4 | 16 | Heaters | 2 | 51% | 8 | 238.0 | 1.25 | 0.00 | 0.00 | 155726.05 | 17.26 | 0.00 |
| | | | 4 | 16 | LARCV | 2 | | 2 | 350.0 | 10.85 | 2.338 | 0.879935 | 2777.60 | 598.53 | 225.26 |
| 44 | Sterngate Marriage to Amphibious Ship/LCU | | 1 | 40 | None | 0 | | | | | | | | | |
| 45 | LCU/LCM Beaching | | 1 | 60 | HMMWVs | 1 | 65% | 3 | 150 | 1.25 | 0.00 | 0.00 | 21988.28 | 2.44 | 0.00 |
| | | | 1 | 60 | 5-ton truck | 1 | 80% | 1 | | 48.21 | 0.00 | 0.03 | 2313.88 | 0.06 | 1.36 |
| | | | 1 | 60 | Dozer | 1 | 59% | 8 | 240.0 | 1.25 | 0.00 | 0.00 | 85156.67 | 9.44 | 0.00 |
| | | | 1 | 60 | LARCV | 1 | | 2 | 350.0 | 10.85 | 2.338 | 0.879935 | 1302.00 | 280.56 | 105.59 |
| 46 | LCU/LCM Towing/Being Towed | | 1 | 60 | Dozer | 1 | 59% | 8 | 240.0 | 1.25 | 0.00 | 0.00 | 85156.67 | 9.44 | 0.00 |

Table C-8
Ground Vehicle GHG Emissions
No Action Alternative

| Scenario | Type Training | Reference | Days (a) | Operations (b) | Ground Vehicles | Number | Engine Load | Hours per day | Horsepower | Emissions Factors (lb/hr) CO2 | Emissions Factors (lb/hr) CH4 | Emissions Factors (lb/hr) N2O | Emissions (lbs) CO2 | Emissions (lbs) CH4 | Emissions (lbs) N2O |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 47 | Communications Training | | 2 | 1 | 4WD Pickups | 4 | | 2 | | 22.71 | 0.00 | 0.00 | 363.41 | 0.03 | 0.03 |
| | | | 2 | 1 | RTVs | 4 | 48% | 8 | 93.0 | 1.25 | 0.00 | 0.00 | 3542.18 | 0.39 | 0.00 |
| | | | 2 | 1 | Bus | 2 | | 2 | | 89.15 | 0.00 | 0.07 | 713.23 | 0.02 | 0.56 |
| | | | 2 | 1 | Tractor with flat b | 1 | 80% | 1 | | 48.21 | 0.00 | 0.03 | 77.13 | 0.00 | 0.05 |
| 48 | Field Training Exercise with a Beach Camp | | 14 | 1 | HMMWVs | 2 | 65% | 3 | 150 | 1.25 | 0.00 | 0.00 | 10261.20 | 1.14 | 0.00 |
| | | | 14 | 1 | 5-ton truck | 1 | 80% | 1 | | 48.21 | 0.00 | 0.03 | 539.91 | 0.01 | 0.32 |
| | | | 14 | 1 | Dozer | 2 | 59% | 8 | 240.0 | 1.25 | 0.00 | 0.00 | 39739.78 | 4.41 | 0.00 |
| | | | 14 | 1 | 4WD Pickups | 10 | | 2 | | 22.71 | 0.00 | 0.00 | 6359.64 | 0.53 | 0.45 |
| | | | 14 | 1 | Fuel Truck | 1 | | 2 | | 22.71 | 0.00 | 0.00 | 635.96 | 0.05 | 0.04 |
| | | | 14 | 1 | 20-ton Stake Tru | 1 | | 2 | 150 | 1.25 | 0.00 | 0.00 | 35.08 | 0.00 | 0.00 |
| | | | 14 | 1 | 50-ton Low-bed T | 1 | | 2 | 150 | 1.25 | 0.00 | 0.00 | 35.08 | 0.00 | 0.00 |
| | | | 14 | 1 | Wheeled Loader | 2 | 47% | 8 | 147.0 | 1.25 | 0.00 | 0.00 | 19183.71 | 2.13 | 0.00 |
| | | | 14 | 1 | Generators/vario | 23 | 30% | 24 | Various | 2064.95 | 0.00 | 5.28 | 208146.96 | 0.00 | 532.22 |
| | | | 14 | 1 | Heaters | 117 | 51% | 8 | 238.0 | 1.25 | 0.00 | 0.00 | 1992806.83 | 220.92 | 0.00 |
| | | | 14 | 1 | Welder | 6 | 45% | 8 | 45.0 | 1.25 | 0.00 | 0.00 | 17049.38 | 1.89 | 0.00 |
| | | | 14 | 1 | LARCV | 2 | | 2 | 350.0 | 10.85 | 2.338 | 0.879935 | 607.60 | 130.93 | 49.28 |
| 49 | Maritime Pre-positioning Ships (MPS) Offload | | 5 | 1 | HMMWVs | 2 | 65% | 3 | 150 | 1.25 | 0.00 | 0.00 | 24.43 | 0.00 | 0.00 |
| | | | 5 | 1 | 5-ton truck | 1 | 80% | 1 | | 48.21 | 0.00 | 0.03 | 192.82 | 0.01 | 0.11 |
| | | | 5 | 1 | Dozer | 1 | 59% | 8 | 240.0 | 1.25 | 0.00 | 0.00 | 7096.39 | 0.79 | 0.00 |
| | | | 5 | 1 | 4WD Pickups | 3 | | 2 | 150 | 22.71 | 0.00 | 0.00 | 681.39 | 0.06 | 0.05 |
| | | | 5 | 1 | LARCV | 1 | | 2 | 350.0 | 10.85 | 2.338 | 0.879935 | 108.50 | 23.38 | 8.80 |
| 50 | Reverse Osmosis Water Purification Unit | | 4 | 4 | 4WD Pickups | 2 | | 2 | | 22.71 | 0.00 | 0.00 | 1453.63 | 0.12 | 0.10 |
| | | | 4 | 4 | RTVs | 6 | 48% | 8 | 93.0 | 1.25 | 0.00 | 0.00 | 42506.17 | 4.71 | 0.00 |
| | | | 4 | 4 | Generator | 1 | 74% | 8 | 22.0 | 1.25 | 0.00 | 0.00 | 2610.83 | 0.29 | 0.00 |
| | | | 4 | 4 | Flatbed Truck | 1 | 80% | 1 | | 48.21 | 0.00 | 0.03 | 617.03 | 0.02 | 0.36 |
| 51 | Roll-on/Roll-off Discharge Facility | | 5 | 1 | HMMWVs/Jeeps | 3 | 65% | 3 | 150 | 1.25 | 0.00 | 0.00 | 5497.07 | 0.61 | 0.00 |
| | | | 5 | 1 | 6-ton truck | 1 | 80% | 1 | | 48.21 | 0.00 | 0.03 | 192.82 | 0.01 | 0.11 |
| | | | 5 | 1 | Dozer | 1 | 59% | 8 | 240.0 | 1.25 | 0.00 | 0.00 | 7096.39 | 0.79 | 0.00 |
| | | | 5 | 1 | Cranes | 2 | 43% | 8 | 94.0 | 1.25 | 0.00 | 0.00 | 4051.36 | 0.45 | 0.00 |
| | | | 5 | 1 | RTVs | 2 | 48% | 8 | 93.0 | 1.25 | 0.00 | 0.00 | 4427.73 | 0.49 | 0.00 |
| | | | 5 | 1 | LARCV | 2 | | 2 | 350.0 | 10.85 | 2.338 | 0.879935 | 217.00 | 46.76 | 17.60 |
| 52 | MPF Utility Boat Operator Course | | 9 | 2 | Dozer | 1 | 59% | 8 | 240.0 | 1.25 | 0.00 | 0.00 | 25547.00 | 2.83 | 0.00 |
| | | | 9 | 2 | Van | 1 | | 2 | | 22.71 | 0.00 | 0.00 | 817.67 | 0.07 | 0.06 |
| | | | 9 | 2 | LARCV | 2 | | 2 | 350.0 | 10.85 | 2.338 | 0.879935 | 781.20 | 168.34 | 63.36 |
| 53 | LARC V Operator Training | | 6 | 1 | LARCV | 2 | | 2 | 350.0 | 10.85 | 2.338 | 0.879935 | 260.40 | 56.11 | 21.12 |
| **4.9.1** | **Conduct Mission Area Training** | | | | | | | | | | | | | | |
| | **NSW Diving and Beach Operations** | | | | | | | | | | | | | | |
| 54 | Lung Automatic Rebreather (LAR) V Closed Circuit Breathing Divir | | 1 | 126 | 4WD Pickups | 3 | | 2 | | 22.71 | 0.00 | 0.00 | 17171.03 | 1.43 | 1.21 |
| | | | 1 | 126 | Bus | 2 | | 2 | | 89.15 | 0.00 | 0.07 | 44933.29 | 0.97 | 35.46 |
| 55 | Open Circuit Breathing Diving | | 1 | 12 | 4WD Pickups | 3 | | 2 | | 22.71 | 0.00 | 0.00 | 1635.34 | 0.14 | 0.12 |
| | | | 1 | 12 | Bus | 2 | | 2 | | 89.15 | 0.00 | 0.07 | 4279.36 | 0.09 | 3.38 |
| 56 | OTB Field Training Exercise | | 5 | 36 | 4WD Pickups | 3 | | 2 | | 22.71 | 0.00 | 0.00 | 24530.04 | 2.04 | 1.73 |
| 57 | Rock Portage | | 1 | 18 | 4WD Pickups | 1 | | 2 | | 22.71 | 0.00 | 0.00 | 817.67 | 0.07 | 0.06 |
| | **NSW Land Warfare** | | | | | | | | | | | | | | |
| 58 | Land Patrolling | | 1 | 18 | 4WD Pickups | 2 | | 2 | | 22.71 | 0.00 | 0.00 | 1635.34 | 0.14 | 0.12 |
| 59 | Immediate Action Drills | | 1 | 5 | 4WD Pickups | 2 | | 2 | | 22.71 | 0.00 | 0.00 | 454.26 | 0.04 | 0.03 |
| | **NSW Advanced Training** | | | | | | | | | | | | | | |
| 60 | Over the Beach Insertion / Photo Reconnaissance | | 1 | 31 | 4WD Pickup | 2 | | 2 | | 22.71 | 0.00 | 0.00 | 2816.41 | 0.23 | 0.20 |
| 61 | Photo Image Capture | | 14 | 3 | 4WD Pickups | 2 | | 2 | | 22.71 | 0.00 | 0.00 | 3815.78 | 0.32 | 0.27 |
| 62 | Field Skills (Observation Drill, Sketching, Range Estimation) | | 1 | 22 | 4WD Pickups | 2 | | 2 | | 22.71 | 0.00 | 0.00 | 1998.74 | 0.17 | 0.14 |
| 63 | Stalking, Movement and Hide-Sites | | 5 | 8 | 4WD Pickups | 3 | | 2 | | 22.71 | 0.00 | 0.00 | 5451.12 | 0.45 | 0.39 |

Table C-8
Ground Vehicle GHG Emissions
No Action Alternative

| Scenario | Type Training | Reference | Days (a) | Operations (b) | Ground Vehicles | Number | Engine Load | Hours per day | Horsepower | Emissions Factors (lb/hr) CO2 | Emissions Factors (lb/hr) CH4 | Emissions Factors (lb/hr) N2O | Emissions (lbs) CO2 | Emissions (lbs) CH4 | Emissions (lbs) N2O |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 64 | CQC/CQD | | 1 | 109 | 4WD Pickups | 5 | | 2 | | 22.71 | 0.00 | 0.00 | 24757.17 | 2.05 | 1.75 |
| 65 | Communications | | 5 | 6 | 4WD Pickups | 6 | | 2 | | 22.71 | 0.00 | 0.00 | 8176.68 | 0.68 | 0.58 |
| 66 | Unmanned Aerial Vehicle (UAV) Training | | 5 | 12 | 4WD Pickups | 1 | | 2 | | 22.71 | 0.00 | 0.00 | 2725.56 | 0.23 | 0.19 |
| 67 | Around the World Training | | 1 | 6 | 4WD Pickups | 4 | | 2 | | 22.71 | 0.00 | 0.00 | 1090.22 | 0.09 | 0.08 |
| **4.9.4** | **Provide/Execute Training for U.S. and Other Nation Units and Individuals** | | | | | | | | | | | | | | |
| | **NSW Physical Fitness Training** | | | | | | | | | | | | | | |
| 68 | Physical Training Runs | | 1 | 464 | 4WD Pickups | 3 | | 2 | | 22.71 | 0.00 | 0.00 | 63232.99 | 5.25 | 4.47 |
| 69 | Physical Conditioning Training Exercise | | 1 | 280 | 4WD Pickups | 2 | | 2 | | 22.71 | 0.00 | 0.00 | 25438.56 | 2.11 | 1.80 |
| 70 | Swim Training | | 1 | 170 | 4WD Pickups | 1 | | 2 | | 22.71 | 0.00 | 0.00 | 7722.42 | 0.64 | 0.55 |
| 71 | Hell Week | | 5 | 6 | 4WD Pickups | 3 | | 2 | | 22.71 | 0.00 | 0.00 | 4088.34 | 0.34 | 0.29 |
| 72 | Rucksack March | | 1 | 54 | 4WD Pickups | 3 | | 2 | | 22.71 | 0.00 | 0.00 | 7359.01 | 0.61 | 0.52 |
| 73 | Monster Mash | | 1 | 6 | 4WD Pickups | 3 | | 2 | | 22.71 | 0.00 | 0.00 | 817.67 | 0.07 | 0.06 |
| **4.12.6** | **Provide Industrial and Environmental Health Services** | | | | | | | | | | | | | | |
| 74 | Conduct Environmental Health Site Assessment | | 3 | 3 | 4WD Pickups | 4 | | 2 | | 22.71 | 0.00 | 0.00 | 1635.34 | 0.14 | 0.12 |
| | | | 3 | 3 | 5-ton truck | 1 | | 2 | | 48.21 | 0.00 | 0.03 | 867.71 | 0.02 | 0.51 |
| | | | 3 | 3 | 3/4-ton trailer | 1 | | 2 | | 48.21 | 0.00 | 0.03 | 867.71 | 0.02 | 0.51 |
| | | | 3 | 3 | small trailers | 3 | | 2 | | 22.71 | 0.00 | 0.00 | 1226.50 | 0.10 | 0.09 |
| **6.1.1** | **Conduct Explosive Ordnance Disposal** | | | | | | | | | | | | | | |
| 75 | Conventional Ordnance/Improvised Explosive Device Response | | 1 | 64 | 4WD Pickups | 2 | | 2 | | 22.71 | 0.00 | 0.00 | 5814.53 | 0.48 | 0.41 |
| 76 | Land Mine Detection/Neutralization | | 1 | 24 | 4WD Pickups / V | 2 | | 2 | | 22.71 | 0.00 | 0.00 | 2180.45 | 0.18 | 0.15 |
| **6.3.1** | **Force Protection: Protect and Secure Area of Operations** | | | | | | | | | | | | | | |
| 77 | Field Training Exercise (FTX) e.g. SEAHAWK | | 14 | 53 | 4WD Pickups | 140 | | 2 | | 22.71 | 0.00 | 0.00 | 3179.82 | 0.26 | 0.22 |
| | | | 14 | 53 | Generators | 176 | 74% | 2 | 22.0 | 1.25 | 0.00 | 0.00 | 220.51 | 0.02 | 0.00 |
| | | | 14 | 53 | Forklift | 8 | 48% | 8 | 37.0 | 1.25 | 0.00 | 0.00 | 10.02 | 0.00 | 0.00 |
| **6.3.3** | **Combat Terrorism** | | | | | | | | | | | | | | |
| 78 | Small Boat Attack | | 1 | 30 | None | | | | | | | | | | |
| | | | | | | | | | | | | | **6138867.99** | **5173.27** | **4801.42** |
| | | | | | | | | | | **Emissions, short tons/year** | | | **3069.43** | **2.59** | **2.40** |

Assumptions: Fuel truck is equivalent to 4WD vehicle; large trucks modeled as MDTs. Busses assumed to be diesel powered
Emission factors from ARB's OFFROAD 2007 Model

Table C-9
Ordnance GHG Emissions
No Action Alternative

| Scenario | Type Training | Reference | Days (a) | Operations (b) | Ordnance | Number | Type | Compound | Number or Amount | Weight of Compound, grams | CO2 lbs/item | Emissions, lbs/year Total CO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Conduct Maneuver - Move Forces** | | | | | | | | | | | |
| 1 | Anchoring | | 1 | 72 | None | | | | | | | |
| 2 | Towing | | 1 | 30 | None | | | | | | | |
| 3 | Moor to Buoy | | 1 | 36 | None | | | | | | | |
| **1.3.1** | **Perform Mine Countermeasures** | | | | | | | | | | | |
| 4 | Parachute Operations | | 1 | 216 | Smoke Grenades/Flares | 3 | Smoke Gre | *M18 Green* | 648 | | 8.40E-02 | 5.44E+01 |
| | | | | | | | Green Para | M195 | 648 | | 8.80E-02 | 5.70E+01 |
| 5 | MCM Operations | | 1 | 32 | Blast Caps/ Diver Recalls | 1 | Underwater | | | | | |
| 6 | Floating Mine Operations | | 1 | 25 | Blast Caps/ Diver Recalls | 1 | | | 25 | | 0.790 | 1.98E+01 |
| 7 | Dive Platoon | | 1 | 8 | Blast Caps/Explosives | 9 per training | Underwater | | | | | |
| | | | 1 | 8 | 3.5 lb | 8 sequential command detonated | Underwater | | | | | |
| 8 | Very Shallow Water (VSW) Operator Course | | 8 | 4 | Diver Recalls | 2 per training | Underwater | | | | | |
| 9 | VSW Mine Countermeasure Operations | | 1 | 120 | Diver Recalls | 2 per training | Underwater | | | | | |
| 10 | Autonomous Underwater Vehicle (AUV) Operations/UUV Operatio | | 1 | 120 | Blast Caps/ Diver Recalls | 2 per training | Underwater | | | | | |
| 11 | MK8 Marine Mammal/MMS Operations | | 1 | 175 | 13lbs [MK 87/88 C-4 in GRP | Approximately 10% of training inv | Underwater | | | | | |
| | | | | | 29lb [MK86/89 PBXN in AL canis | Approximately 10% of training inv | Underwater | | | | | |
| 12 | Mine Neutralization | | 1 | 4 | Blast Caps/ Diver Recalls | 9 per training | Underwater | | 8 | | 0.790 | 6.32E+00 |
| | | | 1 | 4 | 3.5lb explosive | 8 sequential command detonated | Underwater | | | | | |
| **1.4.6** | **Conduct Maritime Interception** | | | | | | | | | | | |
| 13 | Visit, Board, Search and Seizure | | 1 | 30 | None | | | | | | | |
| **1.5.4** | **Conduct Amphibious Operations** | | | | | | | | | | | |
| 14 | Small Boat Handling | | 1 | 94 | None | | | | | | | |
| 15 | Swimmer Conditioning - Bay and Ocean with fins | | 1 | 189 | None | | | | | | | |
| 16 | Basic Reconnaissance Course Final Mission | | 1 | 8 | None | | | | | | | |
| 17 | Obstacle Course | | 1 | 138 | None | | | | | | | |
| 18 | Hydrographic Reconnaissance | | 1 | 40 | None | | | | | | | |
| 19 | Surf Observations (SUROBS) | | 1 | 116 | None | | | | | | | |
| 20 | CRRC Inflatable Boat Small (IBS)/Surf Passage/Boat Team Orgar | | 1 | 72 | None | | | | | | | |
| 21 | CRRC Towing and High Speed Maneuver | | 1 | 8 | None | | | | | | | |
| 22 | CRRC Bay Landing Craft Utility (LCU) Launch and Recover - Bay | | 1 | 24 | None | | | | | | | |
| 23 | CRRC Navigation, Bay and Ocean Runs | | 1 | 26 | None | | | | | | | |
| 24 | Amphibious Raid Course Final Mission | | 1 | 24 | None | | | | | | | |
| 25 | Amphibious Raid Operations | | 3 | 2 | Flares | 3 | Green Para | *M195* | 6 | | 8.80E-02 | 5.28E-01 |
| | | | | | Grenades | 20 | Grenades | *M116A1* | 40 | | 4.10E-03 | 1.64E-01 |
| | | | | | 9MM | 210 | 9 MM | | 210 | | 2.00E-04 | 4.20E-02 |
| | | | | | 5.56MM/38CAL | 60/15 | 5.56 Blank | | 60 | | 2.30E-04 | 1.38E-02 |
| | | | | | | | 38 cal Blank | | 15 | | 9.90E-04 | 1.49E-02 |
| | | | | | Diver Recalls | 3 | Underwater | | | | | |
| 26 | Direct Action (DA) Operations | | 3 | 2 | Explosives | 10 | | | 20 | | 0.790 | 1.58E+01 |
| | | | | | Smoke | 3 | Smoke | | 6 | | 8.40E-02 | 5.04E-01 |
| | | | | | 9MM | 137 per year | 9 MM | | 137 | | 2.00E-04 | 2.74E-02 |
| | | | | | 5.56MM/38CAL | 50/10 per year | 5.56 Blank | | 50 | | 2.30E-04 | 1.15E-02 |
| | | | | | | | 38 cal | | 10 | | 9.90E-04 | 9.90E-03 |

Table C-9
Ordnance GHG Emissions
No Action Alternative

| Scenario | Type Training | Reference | Days (a) | Operations (b) | Ordnance | Number | Type | Compound | Number or Amount | Weight of Compound, grams | CO2 | Emissions, lbs/year |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | lbs/item | Total CO2 |
| | | | | | Diver Recalls | 3 | Underwater | | | | | |
| 27 | Craft Landing Zone (CLZ) | | 1 | 4 | Smoke | 3 | Smoke | | 12 | | 8.40E-02 | 1.01E+00 |
| **1.5.7** | **Conduct Naval Special Warfare** | | | | | | | | | | | |
| 28 | Swimmer/Combat Rubber Raiding Craft Over-the-Beach | | 4 | 52 | Smokes/Flares/Surface Explosiv | 3 flares, 10 grenades | Grenades | *M116A1* | 520 | | 4.10E-03 | 2.13E+00 |
| | | | | | | | Green Para | *M195* | 156 | | 8.80E-02 | 1.37E+01 |
| | | | | | Small Arms | 6600/5000 .5 cal/7.62 mm | 0.5 cal | | 6600 | | 2.10E-03 | 1.39E+01 |
| | | | | | | | 7.62 mm | | 5000 | | 9.50E-04 | 4.75E+00 |
| 29 | Over-the-Beach Stalk | | 1 | 16 | None | | | | | | | |
| 30 | Immediate Action Drills | | 1 | 8 | Smokes/Flares/Surface | 10 | Grenades | *M116A1* | 80 | | 4.10E-03 | 3.28E-01 |
| | | | | | | 3 | Green Para | M195 | 24 | | 8.80E-02 | 2.11E+00 |
| | | | | 6 | Small Arms | 5000 | 0.50 cal/7.62 blank | | 30000 | | 2.10E-03 | 6.30E+01 |
| 31 | Breacher Training | | 1 | 20 | Small Arms | 0 | 12 gauge | | 150 | | 1.30E-03 | 1.95E-01 |
| 32 | Amphibious Warfare Exercise | | 1 | 50 | Smoke Grenades/Flares | 3 | | | | | | |
| 33 | Mobility Primary Mission Area | | 1 | 200 | Smoke/Flares | 3 | Smoke | | 600 | | 8.40E-02 | 5.04E+01 |
| 34 | Escape and Evasion | | 1 | 20 | Smoke/Flares | 3 | Smoke | | 60 | | 8.40E-02 | 5.04E+00 |
| **2.2.3** | **Perform Tactical Reconnaissance and Surveillance** | | | | | | | | | | | |
| 35 | Helicopter Rope Suspension Training/Cast & Recovery Operation | | 1 | 124 | Smoke Grenades/Flares | 3 | Smoke | | 372 | | 8.40E-02 | 3.12E+01 |
| 36 | Rappel and Fast Rope Training | | 1 | 6 | None | 0 | | | | | | |
| 37 | SEAL Delivery Vehicle (SDV)/Advanced Seal Delivery System (AS | | 14 | 14 | ≤ 10 lbs C-4 (underwater) | 1 | Underwater | | | | | |
| **4.5.6** | **Construct, Maintain, and Operate Logistics Over-the-Shore** | | | | | | | | | | | |
| 38 | OPDS | | 25 | 6 | None | 0 | | | | | | |
| 39 | Amphibious Bulk Liquid Transfer System (ABLTS) | | 10 | 4 | None | 0 | | | | | | |
| 40 | Barge Ferry/Causeway Coxswain Training | | 3 | 34 | None | 0 | | | | | | |
| 41 | Causeway Pier Insertion and Retraction | | 5 | 9 | None | 0 | | | | | | |
| 42 | Elevated Causeway System (ELCAS) | | 10 | 2 | None | 0 | | | | | | |
| 43 | Establish Beach Party Command Post | | 4 | 16 | 5.56 caliber rounds | 30 | 5.56 Blank | | 30 | | 2.30E-04 | 6.90E-03 |
| | | | | | 7.62 caliber blanks | 100 | 7.62 caliber blanks | | 100 | (b) | 9.50E-04 | 9.50E-02 |
| 44 | Sterngate Marriage to Amphibious Ship/LCU | | 1 | 40 | None | 0 | | | | | | |
| 45 | LCU/LCM Beaching | | 1 | 60 | None | 0 | | | | | | |
| 46 | LCU/LCM Towing/Being Towed | | 1 | 60 | None | 0 | | | | | | |
| 47 | Communications Training | | 2 | 1 | 0 | | | | | | | |
| 48 | Field Training Exercise with a Beach Camp | | 14 | 1 | 5.56 caliber rounds | 30 | 5.56 Blank | | 30 | (c) | 2.30E-04 | 6.90E-03 |
| | | | | | 7.62 caliber blanks | 100 | 7.62 caliber blanks | | 100 | (c) | 9.50E-04 | 9.50E-02 |
| 49 | Maritime Pre-positioning Ships (MPS) Offload | | 5 | 1 | None | 0 | | | | | | |
| 50 | Reverse Osmosis Water Purification Unit | | 4 | 4 | None | 0 | | | | | | |
| 51 | Roll-on/Roll-off Discharge Facility | | 5 | 1 | None | 0 | | | | | | |
| 52 | MPF Utility Boat Operator Course | | 9 | 2 | None | 0 | | | | | | |
| 53 | LARC V Operator Training | | 6 | 1 | None | 0 | | | | | | |
| **4.9.1** | **Conduct Mission Area Training** | | | | | | | | | | | |
| | **NSW Diving and Beach Operations** | | | | | | | | | | | |
| 54 | Lung Automatic Rebreather (LAR) V Closed Circuit Breathing Divi | | 1 | 126 | Diver Recall | 1 | Underwater | | | | | |
| 55 | Open Circuit Breathing Diving | | 1 | 12 | Diver Recall | 1 | Underwater | | | | | |
| 56 | OTB Field Training Exercise | | 5 | 36 | Small arm | 15000 7.62mm; 19800 .5cal ANN | 7.62 mm | | 15000 | | 6.80E-04 | 1.02E+01 |

Table C-9
Ordnance GHG Emissions
No Action Alternative

| Scenario | Type Training | Reference | Days (a) | Operations (b) | Ordnance | Number | Type | Compound | Number or Amount | Weight of Compound, grams | CO2 lbs/item | Emissions, lbs/year Total CO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | 0.5 cal | | 19800 | | 2.10E-03 | 4.16E+01 |
| 57 | Rock Portage | | 1 | 18 | Smoke Grenades/Flares | 3 | Smoke | | 54 | | 8.40E-02 | 4.54E+00 |
| | | | | | | | Grenades | *M116A1* | 54 | | 3.70E-04 | 2.00E-02 |
| | **NSW Land Warfare** | | | | | | | | | | | |
| 58 | Land Patrolling | | 1 | 18 | None | 0 | | | | | | |
| 59 | Immediate Action Drills | | 1 | 5 | 50CAL/7.62 BLANK | 5000 RNDS per operation (25000 | 0.5 cal | | 25000 | | 2.10E-03 | 5.25E+01 |
| | | | | | | | 7.62 blank | | | | 9.50E-04 | 0.00E+00 |
| | **NSW Advanced Training** | | | | | | | | | | | |
| 60 | Over the Beach Insertion / Photo Reconnaissance | | 1 | 31 | Small arms/blanks | 10 9 mm blanks; 10 5.56 blanks p | 9 mm blank | | 310 | | 2.00E-04 | 6.20E-02 |
| | | | | | | | 5.56 blank | | 310 | | 2.30E-04 | 7.13E-02 |
| 61 | Photo Image Capture | | 14 | 3 | Small arms/blanks | 10 9 mm blanks; 10 5.56 blanks p | 9 mm blank | | 30 | | 2.00E-04 | 6.00E-03 |
| | | | | | | | 5.56 blank | | 30 | | 2.30E-04 | 6.90E-03 |
| 62 | Field Skills (Observation Drill, Sketching, Range Estimation) | | 1 | 22 | Small arms/blanks | 10 9 mm blanks; 10 5.56 blanks p | 9 mm blank | | 220 | | 2.00E-04 | 4.40E-02 |
| | | | | | | | 5.56 blank | | 220 | | 2.30E-04 | 5.06E-02 |
| 63 | Stalking, Movement and Hide-Sites | | 5 | 8 | None | | | | | | | |
| 64 | CQC/CQD | | 1 | 109 | Small Arms | 57600 9 MM simunition annual; 20000 5.56 simunition annual; | | | | | | |
| | | | | 8 | Small Arms | 7200 | 9 MM | | 57600 | | 2.00E-04 | 1.15E+01 |
| | | | | 8 | Small Arms | 10000 | 5.56 Blank | | 20000 | | 2.30E-04 | 4.60E+00 |
| | | | | | Small Arms | 4000 .38 cal | 0.38 cal | | 4000 | | 9.90E-04 | 3.96E+00 |
| | | | | 8 | Grenades (flash crash) | 3 | Grenades | *M116A1* | 327 | | 3.70E-04 | 1.21E-01 |
| 65 | Communications | | 5 | 6 | None | 0 | | | | | | |
| 66 | Unmanned Aerial Vehicle (UAV) Training | | 5 | 12 | none | 0 | | | | | | |
| 67 | Around the World Training | | 1 | 6 | none | 0 | | | | | | |
| **4.9.4** | **Provide/Execute Training for U.S. and Other Nation Units and** | | | | | | | | | | | |
| | **NSW Physical Fitness Training** | | | | | | | | | | | |
| 68 | Physical Training Runs | | 1 | 464 | None | 0 | | | | | | |
| 69 | Physical Conditioning Training Exercise | | 1 | 280 | None | 0 | | | | | | |
| 70 | Swim Training | | 1 | | None | 0 | | | | | | |
| 71 | Hell Week | | 5 | 6 | Smokes | 128 per year | Smoke | | 128 | | 8.40E-02 | 1.08E+01 |
| | | | | | Grenade Simulators | 200 per year | Grenades | *M116A1* | 200 | | 4.10E-03 | 8.20E-01 |
| | | | | | White Para Flares | 12 per year | Flares | *M127A1* | 12 | | 3.80E-03 | |
| | | | | | 7.62 Blank (A111) | 27000 per year | 7.62 mm | | 27000 | | 9.50E-04 | 2.57E+01 |
| | | | | | 50 CAL Blank | 2000 per year | 0.5 cal | | 2000 | | 2.10E-03 | 4.20E+00 |
| 72 | Rucksack March | | 1 | 54 | None | 0 | | | | | | |
| 73 | Monster Mash | | 1 | 6 | None | | | | | | | |
| **4.12.6** | **Provide Industrial and Environmental Health Services** | | | | | | | | | | | |
| 74 | Conduct Environmental Health Site Assessment | | 3 | 3 | None | 0 | | | | | | |
| **6.1.1** | **Conduct Explosive Ordnance Disposal** | | | | | | | | | | | |
| 75 | Conventional Ordnance/Improvised Explosive Device Response | | 1 | 64 | 0 | | | | | | | |
| 76 | Land Mine Detection/Neutralization | | 1 | 24 | 0 | | | | | | | |
| **6.3.1** | **Force Protection: Protect and Secure Area of Operations** | | | | | | | | | | | |
| 77 | Field Training Exercise (FTX) e.g. SEAHAWK | | 14 | 53 | 0.50 cal blanks | 15650 per year | | | 15650 | | 2.10E-03 | 3.29E+01 |
| | | | | | Grenades/flares | 66 per year | Grenades | *M116A1* | 66 | | 4.10E-03 | 2.71E-01 |

Table C-9
Ordnance GHG Emissions
No Action Alternative



| Scenario | Type Training | Reference | Days (a) | Operations (b) | Ordnance | Number | Type | Compound | Number or Amount | Weight of Compound, grams | CO2 lbs/item | Emissions, lbs/year Total CO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | M16 Rounds | 8250 per year | | | 8250 | | 7.80E-03 | |
| | | | | | M60 Rounds | 8250 per year | | | 8250 | | 7.80E-03 | |
| | | | | | 9mm Rounds | 6600 per year | | | 6600 | | 2.00E-04 | 1.32E+00 |
| **6.3.3** | **Combat Terrorism** | | | | | | | | | | | |
| 78 | Small Boat Attack | | 1 | 30 | .50 cal rounds | 350 per exercise | | | 10500 | | 2.10E-03 | 2.21E+01 |

569.85162

**Emissions, short tons/year** 0.28492581

| Scenario | Type Training | Reference Days (a) | Operations (b) | No. of Personnel | Ship/Boat Type | Number of vessels possible | Number of vessels assumed | Vessels per year | Ground Vehicles | Number of vehicles possible | Number of vehicles assumed | Vehicles per year | Aircraft | Number of aircraft possible | Number of aircraft assumed | Aircraft per year | Ordnance | Number of ordnance possible | Number of ordnance assumed |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **1.1.2** | **Conduct Maneuver - Move Forces** | | | | | | | | | | | | | | | | | | |
| 1 | Anchoring | 1 | 72 | | RHIB<br>Ship (DDG or CG) | 1<br>1 | 1<br>1 | 72<br>72 | None | 0 | 0 | 0 | None | 0 | 0 | 0 | None | 0 | 0 |
| 2 | Towing | 1 | 30 | | Foss Tug<br>Ship (DDG or CG) | 1<br>1 | 1<br>1 | 30<br>30 | None | 0 | 0 | 0 | None | 0 | 0 | 0 | None | 0 | 0 |
| 3 | Moor to Buoy | 1 | 36 | | RHIB<br>Ship (DDG or CG) | 1<br>1 | 1<br>1 | 36<br>36 | None | 0 | 0 | 0 | None | 0 | 0 | 0 | None | 0 | 0 |
| **1.3.1** | **Perform Mine Countermeasures** | | | | | | | | | | | | | | | | | | |
| 4 | Parachute Operations | 1 | 228 | 10 to 20 | RHIBs | 2-4 | 3 | 684 | 4WD Pickups | | 2 | 456 | SH60 | 1 | 1 | 228 | Smoke Grenades/Flares | | 3 |
| 5 | MCM Operations | 1 | 58 | 9 | Zodiacs | | 1 | 58 | 4WD Pickups | | 2 | 116 | None | 0 | 0 | 0 | Blast Caps/ Diver Recalls<br>10 - 20 lb Underwater Explosives | <br>1 | <br>1 |
| 6 | Floating Mine Operations | 1 | 53 | | RHIBs | 2 | 2 | 106 | 4WD Pickups | 1 | 1 | 53 | SH-60 - 2 Hour | 1 | 1 | 53 | Blast Caps/ Diver Recalls<br>Less than or equal to 5 lb | <br>1 | 2 per training<br>1 |
| 7 | Dive Platoon | 1 | 8 | | RHIB | 2 | 2 | 16 | None | 0 | 0 | 0 | SH-60 - 2 Hour | 1 | 1 | 8 | Blast Caps/Explosives<br>3.5 lb | <br>8 | 9 per training<br>8 sequential command detonated |
| 8 | Very Shallow Water (VSW) Operator Course | 8 | 6 | 10 | RHIBs / Water-Jet Driven Craft | 2 | 2 | 12 | None | 0 | 0 | 0 | None | 0 | 0 | 0 | Diver Recalls | 2 | 2 per training |
| 9 | VSW Mine Countermeasure Operations | 1 | 156 | 10 to 20 | RHIBs / Water-Jet Driven Craft | 2 to 3 | 3 | 468 | None | 0 | 0 | 0 | None | 0 | 0 | 0 | Diver Recalls | 2 | 2 per training |
| 10 | Autonomous Underwater Vehicle (AUV) Operations/UUV Operations | 1 | 156 | 5 to 10 | RHIBs / Water-Jet Driven Craft<br>Submersible | 2-3<br>2 | 2<br>2 | 312<br>312 | None | 0 | 0 | 0 | None | 0 | 0 | 0 | Blast Caps/ Diver Recalls | 2 | 2 per training |
| 11 | MK8 Marine Mammal/MMS Operations | 1 | 208 | 11 to 13 | RHIBs / Water-Jet Driven Craft | 2 to 4 | 4 | 832 | 4WD Pickups | | 0 | 0 | None | 0 | 0 | 0 | 13lbs [MK 87/88 C-4 in GRP<br>29lb [MK86/89 PBXN in AL canister] | | Approximately 10% of training involves the setting of a 13- or 29-pound<br>Approximately 10% of training involves the setting of a 13- or 29-pound |
| 12 | Mine Neutralization | 1 | 4 | 16 | RHIBs / Water-Jet Driven Craft | | 2 | 8 | 4WD Pickups | 2 | 2 | 8 | SH-60 - 2 Hour | 1 | 1 | 4 | Blast Caps/ Diver Recalls<br>3.5lb explosive | <br>8 | 9 per training<br>8 sequential command detonated |
| N1 | Shock Wave Generator | 1 | 90 | 20 | CRRC<br>LCM-8 | 1<br>1 | 1<br>1 | 90<br>90 | 4WD Pickups | 1 | 1 | 90 | None | 0 | 0 | 0 | Underwater Explosives (15 grams of PETN)<br>Diver Recalls | 1 | 1 command detonation<br>1 per training |
| N2 | Surf Zone Test Detachment/Equipment T&E | 1 | 200 | 10 to 20 | RHIB / Water-Jet Driven Craft / CRRC | 2 | 2 | 400 | 4WD Pickups | 1 | 1 | 200 | None | 0 | 0 | 0 | None | <br>1 | 0 |
| N3 | UUV Neutralization | 1 | 4 | | RHIBs | | 2 | 8 | 4WD Pickups | | 2 | 8 | None | 0 | 0 | 0 | Explosives<br>Seafox (3.3 lb PBXN9)<br>Archerfish (3.57 lb PBXN10) | 1 to 2<br>1 to 2 | 2 sequential charges of either 3.3 or 3.57 lbs<br>2 sequential charges of either 3.3 or 3.57 lbs |
| N4 | Mine Hunting | 1 | 200 | 4 | Acoustic Explorer (mine seeding & maintena | 1 | 1 | 200 | None | 0 | 0 | 0 | SH-60 - 1.5 Hours cruise, 0.5 hours hover | 1 | 1 | 200 | None | 0 | 0 |
| N5 | Airborne Laser Mine Detection | 1 | 48 | 4 | None | 0 | 0 | 0 | None | 0 | 0 | 0 | SH-60 - 1.5 Hours cruise, 0.5 hours hover | 1 | 1 | 48 | None | 0 | 0 |
| N6 | Organic Airborne Surface Influence Sweep | 1 | 100 | 4 | None | 0 | 0 | 0 | None | 0 | 0 | 0 | SH-60 - 1.5 Hours cruise, 0.5 hours hover | 1 | 1 | 100 | None | 0 | 0 |
| N7 | Airborne Mine Neutralization | 1 | 48 | | RHIB | 1 | 1 | 1 | None | 0 | 0 | 0 | SH-60 - 1.5 Hours cruise, 0.5 hours hover | 1 | 1 | 48 | 1.6 kg net explosive (PBXN110) | 1 | 1 per training |
| **1.4.6** | **Conduct Maritime Interception** | | | | | | | | | | | | | | | | | | |
| 13 | Visit, Board, Search and Seizure | 1 | 42 | | Foss Tug<br>RHIB<br>Ship (DDG or CG) | 1<br>1<br>1 | 1<br>1<br>1 | 42<br>42<br>42 | None | 0 | 0 | 0 | None | 0 | 0 | 0 | None | 0 | 0 |
| **1.5.4** | **Conduct Amphibious Operations** | | | | | | | | | | | | | | | | | | |
| 14 | Small Boat Handling | 1 | 94 | 28 | CRRC | 4 | 4 | 376 | HMMWV | 1 | 1 | 94 | None | 0 | 0 | 0 | None | 0 | 0 |
| 15 | Swimmer Conditioning - Bay and Ocean with fins | 1 | 189 | 16 | Personal Watercraft / CRRC / RHIB | 1 | 1 | 189 | HMMWV<br>Truck | 1<br>1 | 1<br>1 | 189<br>189 | None | 0 | 0 | 0 | None | 0 | 0 |
| 16 | Basic Reconnaissance Course Final Mission | 1 | 8 | 40 (in groups of 6 to 8) | IBS<br>LCU | 1<br>1 | 1<br>1 | 8<br>8 | None | 0 | 0 | 0 | SH60 | 1 | 1 | 8 | None | 0 | 0 |
| 17 | Obstacle Course | 1 | 142 | 8 to 150 | None | 0 | 0 | 0 | 4WD Pickups | 1-3 | 2 | 284 | None | 0 | 0 | 0 | None | 0 | 0 |
| 18 | Hydrographic Reconnaissance | 1 | 44 | 8 to 60 | Personal Watercraft<br>Small Water Craft<br>RHIB / CRRC<br>rigid, 10-meter craft | 1<br>1 to 8<br>1<br>1 | 1<br>8<br>1<br>1 | 44<br>44<br>44<br>44 | 4WD Pickups | 1-4 | 3 | 132 | None | 0 | 0 | 0 | None | 0 | 0 |
| 19 | Surf Observations (SUROBS) | 1 | 116 | 16 to 48 | None | 0 | 0 | 0 | 4WD Pickups | 2 | 2 | 232 | None | 0 | 0 | 0 | None | 0 | 0 |
| 20 | CRRC Inflatable Boat Small (IBS)/Surf Passage/Boat Team Organization and Function | 1 | 72 | 28 to 60 | CRRC/Zodiac/Propeller Surface Craft/RHIB<br>Personal Watercraft | 4 to 10<br>1 | 6<br>1 | 432<br>72 | HMMWV/ 4WD Pickup | 1 to 3 | 2 | 144 | None | 0 | 0 | 0 | None | | 0 |
| 21 | CRRC Towing and High Speed Maneuver | 1 | 8 | 28 | CRRC<br>Personal Watercraft | 4<br>1 | 4<br>1 | 32<br>8 | 4WD Pickups / HMMW | 1 | 1 | 8 | None | 0 | 0 | 0 | None | 0 | 0 |
| 22 | CRRC Bay Landing Craft Utility (LCU) Launch and Recover - Bay and Ocean | 1 | 24 | 28 | CRRC<br>Personal Watercraft<br>RHIB<br>LCU | 4<br>1<br>1<br>1 | 4<br>1<br>1<br>1 | 96<br>24<br>24<br>24 | 4WD Pickups / HMMW | 1 | 1 | 24 | None | 0 | 0 | 0 | None | 0 | 0 |

| Scenario | Type Training | Reference Days (a) | Operations (b) | No. of Personnel | Ship/Boat Type | Number of vessels possible | Number of vessels assumed | Vessels per year | Ground Vehicles | Number of vehicles possible | Number of vehicles assumed | Vehicles per year | Aircraft | Number of aircraft possible | Number of aircraft assumed | Aircraft per year | Ordnance | Number of of ordnance possible | Number of ordnance assumed |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 23 | CRRC Navigation, Bay and Ocean Runs | 1 | 26 | 40 | CRRC | 6 | 6 | 156 | 4WD Pickups / HMMW | 1 | 1 | 26 | None | 0 | 0 | 0 | None | 0 | 0 |
| | | | | | RHIB | 1 | 1 | 26 | | | | | | | | | | | |
| 24 | Amphibious Raid Course Final Mission | 1 | 24 | 110-130 | LCU | 2 | 2 | 48 | None | 0 | 0 | 0 | None | 0 | 0 | 0 | None | 0 | 0 |
| | | | | | CRRCs | 6-18 | 12 | 288 | | | | | | | | | | | |
| 25 | Amphibious Raid Operations | 3 | 18 | 150 on foot , 20-40 additional | CRRCs | 10-15 | 13 | 234 | HMMWVs | 4-8 | 6 | 108 | CH-53E | 2 to 4 | 3 | 54 | Flares | | 3 |
| | | | | | LPD | 1 | 1 | 18 | 4WD Pickups | 5 to 10 | 8 | 144 | CH-46E | 4 | 4 | 72 | Grenades | | 20 |
| | | | | | LCUs | 1-2 | 2 | 36 | AAVs | 4-8 | 6 | 108 | UH-1N | 1 | 1 | 18 | 9MM | | 1490 |
| | | | | | LCACs | 1-2 | 2 | 36 | LAVs | 4-8 | 6 | 108 | | | | | 5.56MM/38CAL | | 520/100 |
| | | | | | Submersibles | 1-2 | 2 | 36 | IFAVs | 4-8 | 6 | 108 | | | | | Diver Recalls | | 3 |
| | | | | | EFV | 4-8 | 6 | 108 | | | | | | | | | | | |
| 26 | Direct Action (DA) Operations | 3 | 18 | 90 on foot, 20-40 additional | CRRCs | 8-10 | 9 | 162 | Light Wheeled Vehicle | 11 to 20 | 16 | 288 | CH-46E | 6 to 8 | 7 | 126 | Explosives | | 10 |
| | | | | | LPD | 1 | 1 | 18 | | | | | UH-1N | 1 | 1 | 18 | Smoke | | 3 |
| | | | | | Submersibles | 1-2 | 2 | 36 | | | | | | | | | 9MM | | 1240 per year |
| | | | | | | | | | | | | | | | | | 5.56MM/38CAL | | 430/90 per year |
| | | | | | | | | | | | | | | | | | Diver Recalls | | 3 |
| 27 | Craft Landing Zone (CLZ) | 1 | 4 | | 1 LCAC per CLZ | 1 | 1 | 4 | HMMWVs | 1 | 1 | 4 | None | 0 | 0 | 0 | Smoke | | 3 |
| N8 | Tactical Recovery of Aircraft and Personnel | 1 | 4 | 5 + (10-20 monitor) +1(0 – 20 aggressor | None | 0 | 0 | 0 | 4WD Pickups | 5-8 | 9 | 36 | CH-46E / CH-5 | 4 to 6 | 3 | 12 | Small Arms | | 5000 rnds 50 cal/7.62 blanks |
| | | | | | | | | | | | | | AH-1W | 1 | 1 | 4 | Smoke | | 3 |
| | | | | | | | | | | | | | UH-1N | 1 | 1 | 4 | | | |
| **1.5.7** | **Conduct Naval Special Warfare** | | | | | | | | | | | | | | | | | | |
| 28 | Swimmer/Combat Rubber Raiding Craft Over-the-Beach | 4 | 86 | 80 to 20 | RHIBs / CRRCs | 2 to 4 | 3 | 258 | 4WD Pickups | 1-4 | 3 | 258 | SH-60 Helo | 1 | 1 | 86 | Smokes/Flares/Surface Explosives | | 3 flares, 10 grenades |
| | | | | | Rigid, 10-meter craft | 1 | 1 | 86 | | | | | | | | | Small Arms | | 6600/5000 .5 cal/7.62 mm |
| 29 | Over-the-Beach Stalk | 1 | 24 | | CRRCs | 1 | 1 | 24 | 4WD Pickups | 1 | 1 | 24 | SH-60 Helo | 1 | 1 | 24 | None | | |
| | | | | | Boston Whaler | 1 | 1 | 24 | | | | | | | | | | | |
| 30 | Immediate Action Drills | 1 | 12 | Small groups of 8 to 10 | RHIBs | 1 | 1 | 12 | 4WD Pickups | 4 | 4 | 48 | SH-60 Helo | 1 | 1 | 12 | Smokes/Flares/Surface | | 3 flares, 10 grenades |
| | | | | | CRRCs | 1 | 1 | 12 | | | | | | | | | Small Arms | | 5000 rnds 50 cal/7.62 blank, 6 times/yr |
| 31 | Breacher Training | 1 | 20 | 12 to 40 | None | 0 | | 20 | 4WD Pickups | 3 | 3 | 60 | None | 0 | 0 | 0 | Small Arms | | 1400 rds 12 gauge shot, 6 times/yr |
| 32 | Amphibious Warfare Exercise | 1 | 84 | | RHIBs | 2 | 2 | 168 | None | 0 | 0 | 0 | None | 0 | 0 | 0 | Smoke Grenades/Flares | | 3 |
| | | | | | MK V | 2 | 2 | 168 | | | | | | | | | | | |
| 33 | Mobility Primary Mission Area | 1 | 200 | | RHIB or MK V | 2 to 4 | 4 | 800 | None | 0 | 0 | 0 | None | 0 | 0 | 0 | Smoke/Flares | | 3 per group |
| 34 | Escape and Evasion | 1 | 84 | | RHIBs | 2 | 2 | 168 | None | 0 | 0 | 0 | None | 0 | 0 | 0 | Smoke/Flares | | 3 per group |
| | | | | | MK V | 2 | 2 | 168 | | | | | | | | | | | |
| N9 | Underwater Demolition Qualification / Certification | 1 | 12 | | RHIBs or CRRC | 2 | 2 | 24 | 4WD Pickups | 2 | 2 | 24 | None | 0 | 0 | 0 | 12.5-13.75 pound (underwater) | 2 | two sequential 12.5-13.75 pound charges or a single 25.5-pound charge |
| | | | | | | | | | | | | | | | | | 25.5-pound (underwater) | 1 | two sequential 12.5-13.75 pound charges or a single 25.5-pound charge |
| N10 | Vehicle Patrolling and Testing | 1 | 50 | 20 | None | 0 | 0 | 0 | HMMVS | 6 | 6 | 300 | None | 0 | 0 | 0 | None | 0 | 0 |
| N11 | NSW Demolition Traning: Demolition Requalifications | 1 | 12 | 40 | CRRCs | 4 | 4 | 48 | 4WD Pickups | 1 | 1 | 12 | None | 0 | 0 | 0 | Blast Caps/Diver Recall | | |
| | | | | | | | | | | | | | | | | | 5 -10 pounds of C-4 | 1 | 1 |
| **2.2.3** | **Perform Tactical Reconnaissance and Surveillance** | | | | | | | | | | | | | | | | | | |
| 35 | Helicopter Rope Suspension Training/Cast & Recovery Operation | 1 | 154 | 8 to 50 | RHIBs | 1 | 1 | 154 | 4WD Pickups | 2 to 4 | 2 | 308 | SH60 | 1 | 1 | 154 | Smoke Grenades/Flares | | 3 |
| | | | | | CRRCs | 1 to 3 | 2 | | | | | | CH46 | 1 | 1 | 154 | | | |
| 36 | Rappel and Fast Rope Training | 1 | 11 | | None | 0 | 0 | 0 | 4WD Pickups | | 4 | 44 | NONE | 0 | 0 | 0 | None | 0 | 0 |
| 37 | SEAL Delivery Vehicle (SDV)/Advanced Seal Delivery System (ASDS) Certification to Deploy | 14 | 40 | 20 | RHIBs | 2 | 2 | 80 | 4WD Pickups | 2 | 2 | 80 | SH-60 | | 1 | 40 | ≤ 10 lbs C-4 (underwater) | 1 | 1 |
| **4.5.6** | **Construct, Maintain, and Operate Logistics Over-the-Shore** | | | | | | | | | | | | | | | | | | |
| 38 | OPDS | 25 | 6 | 25 to 65 | OUBs | 1-5 | 2 | 12 | HMMWVs | 1 | 1 | 6 | None | 0 | 0 | 0 | None | 0 | 0 |
| | | | | | | | | | 5-ton truck | 1 | 1 | 6 | | | | | | | |
| | | | | | | | | | Dozer | 2 | 2 | 12 | | | | | | | |
| | | | | | | | | | Comm Van | 1 | 1 | 6 | | | | | | | |
| | | | | | | | | | RTV forklift | 1 | 1 | 6 | | | | | | | |
| | | | | | | | | | LARCV | 2 | 2 | 12 | | | | | | | |
| 39 | Amphibious Bulk Liquid Transfer System (ABLTS) | 10 | 5 | 65 | Warping Tug | 1 | 1 | 5 | HMMWVs | 1 | 1 | 5 | None | 0 | 0 | 0 | None | 0 | 0 |
| | | | | | Barge Ferry | 2 | 2 | 10 | 5-ton truck | 1 | 1 | 5 | | | | | | | |
| | | | | | | | | | Van | 1 | 1 | 5 | | | | | | 0 | 0 |
| | | | | | | | | | Dozers | 2 | 2 | 10 | | | | | | | |
| | | | | | | | | | Rough Terrain Forklift | 1 | 1 | 5 | | | | | | | |
| | | | | | | | | | LARCV | 2 | 2 | 10 | | | | | | | |
| 40 | Barge Ferry/Causeway Coxswain Training | 3 | 54 | up to 36 | Barge Ferry | 2 | 2 | 108 | HMMWVs | 1 | 1 | 54 | None | 0 | 0 | 0 | None | 0 | 0 |
| | | | | | | | | | 5-ton truck | 1 | 1 | 54 | | | | | | | |
| | | | | | | | | | Van | 1 | 1 | 54 | | | | | | | |
| | | | | | | | | | Dozer | 2 | 2 | 108 | | | | | | | |
| | | | | | | | | | LARCV | 2 | 2 | 108 | | | | | | | |

| Scenario | Type Training | Reference Days (a) | Operations (b) | No. of Personnel | Ship/Boat Type | Number of vessels possible | Number of vessels assumed | Vessels per year | Ground Vehicles | Number of vehicles possible | Number of vehicles assumed | Vehicles per year | Aircraft | Number of aircraft possible | Number of aircraft assumed | Aircraft per year | Ordnance | Number of ordnance possible | Number of ordnance assumed |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 41 | Causeway Pier Insertion and Retraction | 5 | 10 | 65 to 75 | WTs | 4 | 4 | 40 | HMMWVs | 2 | 2 | 20 | None | 0 | 0 | 0 | None | 0 | 0 |
| | | | | | | | | | 5-ton truck | 1 | 1 | 10 | | | | | | | |
| | | | | | | | | | Van | 1 | 1 | 10 | | | | | | | |
| | | | | | | | | | Rough Terrain Forklift | 1 | 1 | 10 | | | | | | | |
| | | | | | | | | | Dozers | 2 | 2 | 20 | | | | | | | |
| | | | | | | | | | LARCV | 2 | 2 | 20 | | | | | | | |
| 42 | Elevated Causeway System (ELCAS) | 10 | 4 | 75 to 125 | WTs | 2 | 2 | 8 | HMMWVs | 3 to 4 | 4 | 16 | None | 0 | 0 | 0 | None | 0 | 0 |
| | | | | | Personal Watercraft | 2 | 2 | 8 | 5-ton truck | 1 to 3 | 3 | 12 | | | | | | | |
| | | | | | LCM | 1 | 1 | 4 | Light Trucks | | 4 | 16 | | | | | | | |
| | | | | | | | | | Dozers | 2 | 2 | 8 | | | | | | | |
| | | | | | | | | | Forklifts | 1 | 1 | 4 | | | | | | | |
| | | | | | | | | | 75-Ton Crane | 2 | 2 | 8 | | | | | | | |
| | | | | | | | | | Pile Driver | 2 | 2 | 8 | | | | | | | |
| | | | | | | | | | ambulance | 1 | 1 | 4 | | | | | | | |
| | | | | | | | | | water buffalo | 1 | 1 | 4 | | | | | | | |
| | | | | | | | | | 140-ton crane | 1 | 1 | 4 | | | | | | | |
| | | | | | | | | | 30-ton crane | 2 | 2 | 8 | | | | | | | |
| | | | | | | | | | LARCV | 2 | 2 | 8 | | | | | | | |
| | | | | | | | | | Air compressors | 2 | 2 | 8 | | | | | | | |
| | | | | | | | | | Pile Extractor | 1 | 1 | 4 | | | | | | | |
| 43 | Establish Beach Party Command Post | 4 | 16 | 19 on foot | None | | | | HMMWVs | 3 | 3 | 48 | None | 0 | 0 | 0 | 5.56 caliber rounds | | 30 |
| | | | | | | | | | 5-ton truck | 1 | 1 | 16 | | | | | 7.62 caliber blanks | | 100 |
| | | | | | | | | | Dozer | 1 | 1 | 16 | | | | | | | |
| | | | | | | | | | Generators/various | 2 | 2 | 32 | | | | | | | |
| | | | | | | | | | Heaters | 2 | 2 | | | | | | | | |
| | | | | | | | | | LARCV | 2 | 2 | 32 | | | | | | | |
| 44 | Sterngate Marriage to Amphibious Ship/LCU | 1 | 40 | | LCU | 2 | 2 | 80 | None | 0 | 0 | 0 | None | 0 | 0 | 0 | None | 0 | 0 |
| 45 | LCU/LCM Beaching | 1 | 60 | | LCU | 0 to 2 | 1 | 60 | HMMWVs | | 1 | 60 | None | 0 | 0 | 0 | None | 0 | 0 |
| | | | | | LCM-8 | 0 to 2 | 1 | 60 | 5-ton truck | | 1 | 60 | | | | | | | |
| | | | | | | | | | Dozer | | 1 | 60 | | | | | | | |
| | | | | | | | | | LARCV | | 1 | 60 | | | | | | | |
| 46 | LCU/LCM Towing/Being Towed | 1 | 60 | | LCU | 2 | 2 | 120 | Dozer | 1 | 1 | 60 | None | 0 | 0 | 0 | None | 0 | 0 |
| | | | | | LCM-8 | 2 | 2 | 120 | | | | | | | | | | | |
| 47 | Communications Training | 2 | 2 | 60 persons, but they work in two shifts | None | 0 | 0 | 0 | 4WD Pickups | | 4 | 8 | None | 0 | 0 | 0 | | | |
| | | | | | | | | | RTVs | | 4 | 8 | | | | | | | |
| | | | | | | | | | Bus | 2 | 2 | 4 | | | | | | | |
| | | | | | | | | | Tractor with flat bed | 1 | 1 | 2 | | | | | | | |
| 48 | Field Training Exercise with a Beach Camp | 14 | 2 | 19 | None | | 2 | 4 | HMMWVs | | 2 | 4 | None | 0 | 0 | 0 | 5.56 caliber rounds | | 30 |
| | | | | | | | | | 5-ton truck | | 1 | 2 | | | | | 7.62 caliber blanks | | 100 |
| | | | | | | | | | Dozer | | 2 | 4 | | | | | | | |
| | | | | | | | | | 4WD Pickups | 10 | 10 | 20 | | | | | | | |
| | | | | | | | | | Fuel Truck | 1 | 1 | 2 | | | | | | | |
| | | | | | | | | | 20-ton Stake Trucks | 1 | 1 | 2 | | | | | | | |
| | | | | | | | | | 50-ton Low-bed Trucks | 1 | 1 | 2 | | | | | | | |
| | | | | | | | | | Wheeled Loaders | 2 | 2 | 4 | | | | | | | |
| | | | | | | | | | Generators/various | 23 | 23 | 46 | | | | | | | |
| | | | | | | | | | Heaters | 117 | 117 | 234 | | | | | | | |
| | | | | | | | | | Welder | 6 | 6 | 12 | | | | | | | |
| | | | | | | | | | LARCV | | 2 | 4 | | | | | | | |
| 49 | Maritime Pre-positioning Ships (MPS) Offload | 5 | 2 | 72 | LCM-8 | | 2 | 4 | HMMWVs | | 2 | 4 | None | 0 | 0 | 0 | None | 0 | 0 |
| | | | | | WTs | | 2 | 4 | 5-ton truck | | 1 | 2 | | | | | | | |
| | | | | | Barge Ferry | | 2 | 4 | Dozer | | 1 | 2 | | | | | | | |
| | | | | | | | 1 | 2 | 4WD Pickups | | 3 | 6 | | | | | | | |
| | | | | | | | | | LARCV | | 1 | 2 | | | | | | | |
| 50 | Reverse Osmosis Water Purification Unit | 4 | 4 | 6 | None | 0 | 0 | 0 | 4WD Pickups | | 2 | 8 | None | 0 | 0 | 0 | None | 0 | 0 |
| | | | | | | | | | RTVs | | 6 | 24 | | | | | | | |
| | | | | | | | | | Generator | | 1 | 4 | | | | | | | |
| | | | | | | | | | Flatbed Truck | 1 | 1 | 4 | | | | | | | |
| 51 | Roll-on/Roll-off Discharge Facility | 5 | 2 | 40 | WTs | | 2 | 4 | HMMWVs/Jeeps | | 3 | 6 | None | 0 | 0 | 0 | None | 0 | 0 |
| | | | | | Personal Watercraft | | 2 | 4 | 6-ton truck | | 1 | 2 | | | | | | | |
| | | | | | | | | | Dozer | | 1 | 2 | | | | | | | |
| | | | | | | | | | Cranes | | 2 | 4 | | | | | | | |
| | | | | | | | | | RTVs | | 2 | 4 | | | | | | | |
| | | | | | | | | | LARCV | | 2 | 4 | | | | | | | |
| 52 | MPF Utility Boat Operator Course | 9 | 2 | 15 | MPF Utility Boat | 2 | 2 | 4 | Dozer | 1 | 1 | 2 | None | 0 | 0 | 0 | None | 0 | 0 |
| | | | | | | 2 | 2 | 4 | Van | 1 | 1 | 2 | | | | | | | |
| | | | | | | | | | LARCV | 2 | 2 | 4 | | | | | | | |
| 53 | LARC V Operator Training | 6 | 1 | 10 | None | | | | LARCV | 2 | 2 | 2 | None | 0 | 0 | 0 | None | 0 | 0 |
| **4.9.1** | **Conduct Mission Area Training** | | | | | | | | | | | | | | | | | | |
| | **NSW Diving and Beach Operations** | | | | | | | | | | | | | | | | | | |
| 54 | Lung Automatic Rebreather (LAR) V Closed Circuit Breathing Diving | 1 | 126 | | RHIBs | 5 | 5 | 630 | 4WD Pickups | 3 | 3 | 378 | None | 0 | 0 | 0 | Diver Recall | 1 | 1 |
| | | | | | | | | | Bus | 2 | 2 | 252 | | | | | | | |
| 55 | Open Circuit Breathing Diving | 1 | 12 | 60 | RHIBs | 5 | 5 | 60 | 4WD Pickups | 3 | 3 | 36 | None | 0 | 0 | 0 | Diver Recall | 1 | 1 |
| | | | | | LCU | 1 | 1 | 12 | Bus | 2 | 2 | 24 | | | | | | | |
| 56 | OTB Field Training Exercise | 5 | 36 | 60 | CRRCs | 5 | 5 | 180 | 4WD Pickups | 3 | 3 | 108 | None | 0 | 0 | 0 | Small arm | | 15000 7.62mm; 19800 .5cal ANNUAL |
| 57 | Rock Portage | 1 | 20 | 60 | CRRCs | 5 to 8 | 7 | 140 | 4WD Pickups | 1 | 1 | 20 | None | 0 | 0 | 0 | Smoke Grenades/Flares | | 3 |
| | | | | | IBS | 8 to 10 | 9 | 180 | | | | | | | | | | | |
| | **NSW Land Warfare** | | | | | | | | | | | | | | | | | | |
| 58 | Land Patrolling | 1 | 18 | 60 | None | 0 | 0 | 0 | 4WD Pickups | 2 | 2 | 36 | None | 0 | 0 | 0 | None | 0 | 0 |

| Scenario | Type Training | Reference Days (a) | Operations (b) | No. of Personnel | Ship/Boat Type | Number of vessels possible | Number of vessels assumed | Vessels per year | Ground Vehicles | Number of vehicles possible | Number of vehicles assumed | Vehicles per year | Aircraft | Number of aircraft possible | Number of aircraft assumed | Aircraft per year | Ordnance | Number of ordnance possible | Number of ordnance assumed |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 59 | Immediate Action Drills | 1 | 6 | 60 | None | 0 | 0 | 0 | 4WD Pickups | 2 | 2 | 12 | None | 0 | 0 | 0 | .5CAL/7.62 BLANK | | 5000 RNDS each per operation (30000 rounds each type annual) |
| | **NSW Advanced Training** | | | | | | | | | | | | | | | | | | |
| 60 | Over the Beach Insertion / Photo Reconnaissance | 1 | 31 | 20 | RHIB/CRRC<br>Kayak | 2<br>1 | 1<br>1 | 31<br>31 | 4WD Pickup | 2 | 2 | 62 | None | 0 | 0 | 0 | Small arms/blanks | | 10 9 mm blanks; 10 5.56 blanks per operation |
| 61 | Photo Image Capture | 14 | 4 | 20 | None | 0 | 0 | 0 | 4WD Pickups | 2 | 2 | 28 | None | 0 | 0 | 0 | Small arms/blanks | | 10 9 mm blanks; 10 5.56 blanks per operation |
| 62 | Field Skills (Observation Drill, Sketching, Range Estimation) | 1 | 24 | 20 | None | 0 | 0 | 0 | 4WD Pickups | 2 | 2 | 48 | None | 0 | 0 | 0 | Small arms/blanks | | 10 9 mm blanks; 10 5.56 blanks per operation |
| 63 | Stalking, Movement and Hide-Sites | 5 | 8 | 14 | None | 0 | 0 | 0 | 4WD Pickups | 3 | 3 | 24 | None | 0 | 0 | 0 | None | 0 | 0 |
| 64 | CQC/CQD | 1 | 198 | 580 | CRRCs | | 5 | | 4WD Pickups | | 5 | 990 | SH-60 | 1 | 1 | 198 | Small Arms<br>Small Arms<br>Grenades (flash crash)<br>Explosives (<1lb), accounted for in Breacher Training | | 104600 9 MM simunition; 36300 5.56 simunition;<br>7300 .38 cal<br>3 |
| 65 | Communications | 5 | 6 | 20 | None | 0 | 0 | 0 | 4WD Pickups | 6 | 6 | 36 | None | 0 | 0 | 0 | None | 0 | 0 |
| 66 | Unmanned Aerial Vehicle (UAV) Training | 5 | 12 | 6 | None | 0 | 0 | 0 | 4WD Pickups | 1 | 1 | 12 | UAV | 2 | 2 | 24 | none | 0 | 0 |
| 67 | Around the World Training | 1 | 6 | 60 | CRRCs<br>Sea Kayaks | 7<br>5 | 7<br>5 | 42<br>30 | 4WD Pickups | 4 | 4 | 24 | None | 0 | 0 | 0 | none | 0 | 0 |
| **4.9.4** | **Provide/Execute Training for U.S. and Other Nation Units and Individuals**<br>**NSW Physical Fitness Training** | | | | | | | | | | | | | | | | | | |
| 68 | Physical Training Runs | 1 | 464 | 30 to 150 averaging 60 | None | 0 | 0 | 0 | 4WD Pickups | 2-3 | 3 | 1392 | None | 0 | 0 | 0 | None | 0 | 0 |
| 69 | Physical Conditioning Training Exercise | 1 | 280 | 60 to 150 (avg 60) | CRRCs / Propeller Surface Craft | 2-4 | 3 | 840 | 4WD Pickups | 2 | 2 | 560 | None | 0 | 0 | 0 | None | 0 | 0 |
| 70 | Swim Training | 1 | 172 | 48-60 | RHIBs | 5 | 5 | 860 | 4WD Pickups | 1 | 1 | 172 | None | 0 | 0 | 0 | None | 0 | 0 |
| 71 | Hell Week | 5 | 6 | 60 | CRRCs | 5 | 5 | 30 | 4WD Pickups | 3 | 3 | 18 | None | 0 | 0 | 0 | Smokes<br>Grenade Simulators<br>White Para Flares<br>7.62 Blank (A111)<br>50 CAL Blank | | 128 per year<br>200 per year<br>12 per year<br>27000 per year<br>2000 per year |
| 72 | Rucksack March | 1 | 54 | 60 | None | 0 | 0 | 0 | 4WD Pickups | 2-3 | 3 | 162 | None | 0 | 0 | 0 | None | 0 | 0 |
| 73 | Monster Mash | 1 | 6 | 60 | CRRCs | | 3 | 18 | 4WD Pickups | 3 | 3 | 18 | None | 0 | 0 | 0 | None | | |
| **4.12.6** | **Provide Industrial and Environmental Health Services** | | | | | | | | | | | | | | | | | | |
| 74 | Conduct Environmental Health Site Assessment | 3 | 3 | 14 | None | 0 | 0 | 0 | 4WD Pickups<br>5-ton truck<br>3/4-ton trailer<br>small trailers | 4<br>1<br>1<br>3 | 4<br>1<br>1<br>3 | 12<br>3<br>3<br>9 | None | 0 | 0 | 0 | None | 0 | 0 |
| **6.1.1** | **Conduct Explosive Ordnance Disposal** | | | | | | | | | | | | | | | | | | |
| 75 | Conventional Ordnance/Improvised Explosive Device Response | 1 | 120 | 9 | None | 0 | 0 | 0 | 4WD Pickups | 2 | 2 | 240 | None | 0 | 0 | 0 | | | |
| 76 | Land Mine Detection/Neutralization | 1 | 45 | 8 to 10 | None | 0 | 0 | 0 | 4WD Pickups / Vans | 2 | 2 | 90 | None | 0 | 0 | 0 | | | |
| **6.3.1** | **Force Protection: Protect and Secure Area of Operations** | | | | | | | | | | | | | | | | | | |
| 77 | Field Training Exercise (FTX) e.g. SEAHAWK | 14 | 53 | 50-1000 | Boston Whalers | 0 to 24 | 12 | 144 | 4WD Pickups<br>Generators<br>Forklift | 7 to 85<br>3 to 16<br>8 | | 140<br>176<br>8 | None | 0 | 0 | 0 | 0.50 cal blanks<br>Grenades/flares<br>M16 Rounds<br>M60 Rounds<br>9mm Rounds | | 15650 per year<br>66 per year<br>8250 per year<br>8250 per year<br>6600 per year |
| **6.3.3** | **Combat Terrorism** | | | | | | | | | | | | | | | | | | |
| 78 | Small Boat Attack | 1 | 36 | | Boston Whalers<br>surface vessel dropping anchor and 3 shots<br>18' Bayliner | 1<br>1<br>1 | 1<br>1<br>1 | 36<br>36<br>36 | None | 0 | 0 | 0 | None | 0 | 0 | 0 | .50 cal rounds | 350 | 350 per exercise |
| | Totals | | 5343 | | | | | 12893 | | | | 10966 | | | | 1697 | | | |

(a) Days = the number of days per operation
(b) Operations = the number of operations per year

| Scenario | Type Training | Reference | Days (a) | Operations (b) | Aircraft | Number | Aircraft Time on Range (hrs) | Emissions Factors (lb/operation) (c) | | | | | Emissions (lbs) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Hours | CO | NOx | ROG | SOx | PM10 | CO | Nox | ROG | Sox | PM |
| **1.1.2** | **Conduct Maneuver - Move Forces** | | | | | | | | | | | | | | | | |
| 1 | Anchoring | | 1 | 72 | None | 0 | | | | | | | | | | | |
| 2 | Towing | | 1 | 30 | None | 0 | | | | | | | | | | | |
| 3 | Moor to Buoy | | 1 | 36 | None | 0 | | | | | | | | | | | |
| **1.3.1** | **Perform Mine Countermeasures** | | | | | | | | | | | | | | | | |
| 4 | Parachute Operations | | 1 | 228 | SH60 | 1 | 1.0 | 7.50 | 7.68 | 0.66 | 0.48 | 5.04 | 1710 | 1751.04 | 150.48 | 109.44 | 1149.12 |
| 5 | MCM Operations | | 1 | 58 | None | 0 | | | | | | | | | | | |
| 6 | Floating Mine Operations | | 1 | 53 | SH-60 - 2 Hours | 1 | 2.0 | 7.50 | 7.68 | 0.66 | 0.48 | 5.04 | 795 | 814.08 | 69.96 | 50.88 | 534.24 |
| 7 | Dive Platoon | | 1 | 8 | SH-60 - 2 Hours | 1 | 2.0 | 7.50 | 7.68 | 0.66 | 0.48 | 5.04 | 120 | 122.88 | 10.56 | 7.68 | 80.64 |
| 8 | Very Shallow Water (VSW) Operator Course | | 8 | 6 | None | 0 | | | | | | | | | | | |
| 9 | VSW Mine Countermeasure Operations | | 1 | 156 | None | 0 | | | | | | | | | | | |
| 10 | Autonomous Underwater Vehicle (AUV) Operations/UUV Operations | | 1 | 156 | None | 0 | | | | | | | | | | | |
| 11 | MK8 Marine Mammal/MMS Operations | | 1 | 208 | None | 0 | | | | | | | | | | | |
| 12 | Mine Neutralization | | 1 | 4 | SH-60 - 2 Hours | 1 | 2.0 | 7.50 | 7.68 | 0.66 | 0.48 | 5.04 | 60 | 61.44 | 5.28 | 3.84 | 40.32 |
| N1 | Shock Wave Generator | | 1 | 90 | None | | | | | | | | | | | | |
| N2 | Surf Zone Test Detachment/Equipment T&E | | 1 | 200 | None | | | | | | | | | | | | |
| N3 | UUV Neutralization | | 1 | 4 | None | | | | | | | | | | | | |
| N4 | Mine Hunting | | 1 | 200 | SH-60 - 1.5 Hours cruise | 1 | 1.5 | 7.50 | 7.68 | 0.66 | 0.48 | 5.04 | 2250 | 2304 | 198 | 144 | 1512 |
| | | | 1 | 200 | Hover | 1 | 0.5 | 1.63 | 2.44 | 0.19 | 0.14 | 1.48 | 162.9635 | 243.915 | 19.4425 | 14.14 | 148.47 |
| N5 | Airborne Laser Mine Detection | | 1 | 48 | SH-60 - 1.5 Hours cruise | 1 | 1.5 | 7.50 | 7.68 | 0.66 | 0.48 | 5.04 | 540 | 552.96 | 47.52 | 34.56 | 362.88 |
| | | | 1 | 48 | Hover | 1 | 0.5 | 1.63 | 2.44 | 0.19 | 0.14 | 1.48 | 39.11124 | 58.5396 | 4.6662 | 3.3936 | 35.6328 |
| N6 | Organic Airborne Surface Influence Sweep | | 1 | 100 | SH-60 - 1.5 Hours cruise | 1 | 1.5 | 7.50 | 7.68 | 0.66 | 0.48 | 5.04 | 1125 | 1152 | 99 | 72 | 756 |
| | | | 1 | 100 | Hover | 1 | 0.5 | 1.63 | 2.44 | 0.19 | 0.14 | 1.48 | 81.48175 | 121.9575 | 9.72125 | 7.07 | 74.235 |
| N7 | Airborne Mine Neutralization | | 1 | 48 | SH-60 - 1.5 Hours cruise | 1 | 1.5 | 7.50 | 7.68 | 0.66 | 0.48 | 5.04 | 540 | 552.96 | 47.52 | 34.56 | 362.88 |
| | | | 1 | 48 | Hover | 1 | 0.5 | 1.63 | 2.44 | 0.19 | 0.14 | 1.48 | 39.11124 | 58.5396 | 4.6662 | 3.3936 | 35.6328 |
| **1.4.6** | **Conduct Maritime Interception** | | | | | | | | | | | | | | | | |
| 13 | Visit, Board, Search and Seizure | | 1 | 42 | None | 0 | | | | | | | | | | | |
| **1.5.4** | **Conduct Amphibious Operations** | | | | | | | | | | | | | | | | |
| 14 | Small Boat Handling | | 1 | 94 | None | 0 | | | | | | | | | | | |
| 15 | Swimmer Conditioning - Bay and Ocean with fins | | 1 | 189 | None | 0 | | | | | | | | | | | |
| 16 | Basic Reconnaissance Course Final Mission | | 1 | 8 | SH60 | 1 | 4.0 | 7.50 | 7.68 | 0.66 | 0.48 | 5.04 | 240 | 245.76 | 21.12 | 15.36 | 161.28 |
| 17 | Obstacle Course | | 1 | 142 | None | 0 | | | | | | | | | | | |
| 18 | Hydrographic Reconnaissance | | 1 | 44 | None | 0 | | | | | | | | | | | |
| 19 | Surf Observations (SUROBS) | | 1 | 116 | None | 0 | | | | | | | | | | | |
| 20 | CRRC Inflatable Boat Small (IBS)/Surf Passage/Boat Team Organization and Function | | 1 | 72 | None | 0 | | | | | | | | | | | |
| 21 | CRRC Towing and High Speed Maneuver | | 1 | 8 | None | 0 | | | | | | | | | | | |
| 22 | CRRC Bay Landing Craft Utility (LCU) Launch and Recover - Bay and Ocean | | 1 | 24 | None | 0 | | | | | | | | | | | |
| 23 | CRRC Navigation, Bay and Ocean Runs | | 1 | 26 | None | 0 | | | | | | | | | | | |
| 24 | Amphibious Raid Course Final Mission | | 1 | 24 | None | 0 | | | | | | | | | | | |
| 25 | Amphibious Raid Operations | | 3 | 18 | CH-53E | 3 | 4.0 | 9.51 | 36.07 | 0.67 | 1.79 | 9.87 | 2054.16 | 7791.12 | 144.72 | 386.64 | 2131.92 |
| | | | | | CH-46E | 4 | 4.0 | 22.109 | 4.41 | 3.84 | 0.45 | 1.99 | 6367.392 | 1270.08 | 1105.92 | 129.6 | 573.12 |
| | | | | | CH-53E T&G | 3 | 1.0 | 0.77 | 2.11 | 0.13 | 0.11 | 0.61 | 41.58 | 113.94 | 7.02 | 5.94 | 32.94 |
| | | | | | CH-46E T&G | 4 | 1.0 | 1.85 | 0.4 | 0.34 | 0.04 | 0.19 | 133.2 | 28.8 | 24.48 | 2.88 | 13.68 |
| | | | | | UH-1N | 1 | 4.0 | 0.7 | 4.01 | 0.09 | 0.28 | 2.91 | 50.4 | 288.72 | 6.48 | 20.16 | 209.52 |
| 26 | Direct Action (DA) Operations | | 3 | 18 | CH-46E | 7 | 4.0 | 22.109 | 4.41 | 3.84 | 0.45 | 1.99 | 11142.94 | 2222.64 | 1935.36 | 226.8 | 1002.96 |
| | | | | | UH-1N | 1 | 4.0 | 0.7 | 4.01 | 0.09 | 0.28 | 2.91 | 50.4 | 288.72 | 6.48 | 20.16 | 209.52 |
| 27 | Craft Landing Zone (CLZ) | | 1 | 4 | None | 0 | | | | | | | | | | | |
| N8 | Tactical Recovery of Aircraft and Personnel | | 1 | 4 | CH-46E / CH-53E | 3 | 4.0 | 22.109 | 4.41 | 3.84 | 0.45 | 1.99 | 1061.232 | 211.68 | 184.32 | 21.6 | 95.52 |
| | | | 1 | 4 | AH-1W | 1 | 4.0 | 8.96 | 4.72 | 0.48 | 0.34 | 3.57 | 143.36 | 75.52 | 7.68 | 5.44 | 57.12 |
| | | | 1 | 4 | UH-1N | 1 | 4.0 | 0.7 | 4.01 | 0.09 | 0.28 | 2.91 | 11.2 | 64.16 | 1.44 | 4.48 | 46.56 |
| **1.5.7** | **Conduct Naval Special Warfare** | | | | | | | | | | | | | | | | |
| 28 | Swimmer/Combat Rubber Raiding Craft Over-the-Beach | | 4 | 86 | SH-60 Helo | 1 | | | | | | | | | | | |
| | | | | | | | 1.0 | 7.50 | 7.68 | 0.66 | 0.48 | 5.04 | 2580 | 2641.92 | 227.04 | 165.12 | 1733.76 |
| 29 | Over-the-Beach Stalk | | 1 | 24 | SH-60 Helo | 1 | 1.0 | 7.50 | 7.68 | 0.66 | 0.48 | 5.04 | 180 | 184.32 | 15.84 | 11.52 | 120.96 |
| 30 | Immediate Action Drills | | 1 | 12 | SH-60 Helo | 1 | 1.0 | 7.50 | 7.68 | 0.66 | 0.48 | 5.04 | 90 | 92.16 | 7.92 | 5.76 | 60.48 |
| 31 | Breacher Training | | 1 | 20 | None | | | | | | | | | | | | |
| 32 | Amphibious Warfare Exercise | | 1 | 84 | None | | | | | | | | | | | | |
| 33 | Mobility Primary Mission Area | | 1 | 200 | None | | | | | | | | | | | | |
| 34 | Escape and Evasion | | 1 | 84 | None | | | | | | | | | | | | |
| N9 | Underwater Demolition Qualification / Certification | | 1 | 12 | None | | | | | | | | | | | | |
| N10 | Vehicle Patrolling and Testing | | 1 | 50 | None | | | | | | | | | | | | |

| Scenario | Type Training | Reference | Days (a) | Operations (b) | Aircraft | Number | Aircraft Time on Range (hrs) | Emissions Factors (lb/operation) (c) | | | | | Emissions (lbs) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Hours | CO | NOx | ROG | SOx | PM10 | CO | Nox | ROG | Sox | PM |
| N11 | NSW Demolition Traning: Demolition Requalifications and Training (Underwater Detonations) | | 1 | 12 | None | | | | | | | | | | | | |
| **2.2.3** | **Perform Tactical Reconnaissance and Surveillance** | | | | | | | | | | | | | | | | |
| 35 | Helicopter Rope Suspension Training/Cast & Recovery Operation | | 1 | 154 | SH60 | 1 | 1.0 | 0.81 | 1.03 | 0.08 | 0.06 | 0.64 | 124.74 | 158.62 | 12.32 | 9.24 | 98.56 |
| | | | 1 | 154 | CH46 | 1 | 1.0 | 1.87 | 0.39 | 0.35 | 0.04 | 0.19 | 287.98 | 60.06 | 53.9 | 6.16 | 29.26 |
| 36 | Rappel and Fast Rope Training | | 1 | 11 | NONE | 0 | | | | | | | | | | | |
| 37 | SEAL Delivery Vehicle (SDV)/Advanced Seal Delivery System (ASDS) Certification to Deploy | | 14 | 40 | SH-60 | 1 | 1.0 | 7.50 | 7.68 | 0.66 | 0.48 | 5.04 | 4200 | 4300.8 | 369.6 | 268.8 | 2822.4 |
| **4.5.6** | **Construct, Maintain, and Operate Logistics Over-the-Shore** | | | | | | | | | | | | | | | | |
| 38 | OPDS | | 25 | 6 | None | 0 | | | | | | | | | | | |
| 39 | Amphibious Bulk Liquid Transfer System (ABLTS) | | 10 | 5 | None | 0 | | | | | | | | | | | |
| 40 | Barge Ferry/Causeway Coxswain Training | | 3 | 54 | None | 0 | | | | | | | | | | | |
| 41 | Causeway Pier Insertion and Retraction | | 5 | 10 | None | 0 | | | | | | | | | | | |
| 42 | Elevated Causeway System (ELCAS) | | 10 | 4 | None | 0 | | | | | | | | | | | |
| 43 | Establish Beach Party Command Post | | 4 | 16 | None | 0 | | | | | | | | | | | |
| 44 | Sterngate Marriage to Amphibious Ship/LCU | | 1 | 40 | None | 0 | | | | | | | | | | | |
| 45 | LCU/LCM Beaching | | 1 | 60 | None | 0 | | | | | | | | | | | |
| 46 | LCU/LCM Towing/Being Towed | | 1 | 60 | None | 0 | | | | | | | | | | | |
| 47 | Communications Training | | 2 | 2 | None | 0 | | | | | | | | | | | |
| 48 | Field Training Exercise with a Beach Camp | | 14 | 2 | None | 0 | | | | | | | | | | | |
| 49 | Maritime Pre-positioning Ships (MPS) Offload | | 5 | 2 | None | 0 | | | | | | | | | | | |
| 50 | Reverse Osmosis Water Purification Unit | | 4 | 4 | None | 0 | | | | | | | | | | | |
| 51 | Roll-on/Roll-off Discharge Facility | | 5 | 2 | None | 0 | | | | | | | | | | | |
| 52 | MPF Utility Boat Operator Course | | 9 | 2 | None | 0 | | | | | | | | | | | |
| 53 | LARC V Operator Training | | 6 | 1 | None | 0 | | | | | | | | | | | |
| **4.9.1** | **Conduct Mission Area Training** | | | | | | | | | | | | | | | | |
| | **NSW Diving and Beach Operations** | | | | | | | | | | | | | | | | |
| 54 | Lung Automatic Rebreather (LAR) V Closed Circuit Breathing Diving | | 1 | 126 | None | 0 | | | | | | | | | | | |
| 55 | Open Circuit Breathing Diving | | 1 | 12 | None | 0 | | | | | | | | | | | |
| 56 | OTB Field Training Exercise | | 5 | 36 | None | 0 | | | | | | | | | | | |
| 57 | Rock Portage | | 1 | 20 | None | 0 | | | | | | | | | | | |
| | **NSW Land Warfare** | | | | | | | | | | | | | | | | |
| 58 | Land Patrolling | | 1 | 18 | None | 0 | | | | | | | | | | | |
| 59 | Immediate Action Drills | | 1 | 6 | None | 0 | | | | | | | | | | | |
| | **NSW Advanced Training** | | | | | | | | | | | | | | | | |
| 60 | Over the Beach Insertion / Photo Reconnaissance | | 1 | 31 | None | 0 | | | | | | | | | | | |
| 61 | Photo Image Capture | | 14 | 4 | None | 0 | | | | | | | | | | | |
| 62 | Field Skills (Observation Drill, Sketching, Range Estimation) | | 1 | 24 | None | 0 | | | | | | | | | | | |
| 63 | Stalking, Movement and Hide-Sites | | 5 | 8 | None | 0 | | | | | | | | | | | |
| 64 | CQC/CQD | | 1 | 198 | SH-60 | 1 | 3.0 | 7.5 | 7.68 | 0.66 | 0.48 | 5.04 | 6890.4 | 5235.12 | 669.24 | 344.52 | 3449.16 |
| 65 | Communications | | 5 | 6 | None | 0 | | | | | | | | | | | |
| 66 | Unmanned Aerial Vehicle (UAV) Training | | 5 | 12 | UAV | 2 | | | | | | | | | | | |
| 67 | Around the World Training | | 1 | 6 | None | 0 | | | | | | | | | | | |
| **4.9.4** | **Provide/Execute Training for U.S. and Other Nation Units and Individuals** | | | | | | | | | | | | | | | | |
| | **NSW Physical Fitness Training** | | | | | | | | | | | | | | | | |
| 68 | Physical Training Runs | | 1 | 464 | None | 0 | | | | | | | | | | | |
| 69 | Physical Conditioning Training Exercise | | 1 | 280 | None | 0 | | | | | | | | | | | |
| 70 | Swim Training | | 1 | 172 | None | 0 | | | | | | | | | | | |
| 71 | Hell Week | | 5 | 6 | None | 0 | | | | | | | | | | | |
| 72 | Rucksack March | | 1 | 54 | None | 0 | | | | | | | | | | | |
| 73 | Monster Mash | | 1 | 6 | None | 0 | | | | | | | | | | | |
| **4.12.6** | **Provide Industrial and Environmental Health Services** | | | | | | | | | | | | | | | | |
| 74 | Conduct Environmental Health Site Assessment | | 3 | 3 | None | 0 | | | | | | | | | | | |
| **6.1.1** | **Conduct Explosive Ordnance Disposal** | | | | | | | | | | | | | | | | |
| 75 | Conventional Ordnance/Improvised Explosive Device Response | | 1 | 120 | None | | | | | | | | | | | | |
| 76 | Land Mine Detection/Neutralization | | 1 | 45 | None | | | | | | | | | | | | |
| **6.3.1** | **Force Protection: Protect and Secure Area of Operations** | | | | | | | | | | | | | | | | |
| 77 | Field Training Exercise (FTX) e.g. SEAHAWK | | 14 | 53 | None | 0 | | | | | | | | | | | |

Table C-11
Aircraft Emissions
Alternatives 1 and 2

| Scenario | Type Training | Reference | Days (a) | Operations (b) | Aircraft | Number | Aircraft Time on Range (hrs) | Emissions Factors (lb/operation) (c) | | | | | Emissions (lbs) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Hours | CO | NOx | ROG | SOx | PM10 | CO | Nox | ROG | Sox | PM |
| 6.3.3 | **Combat Terrorism** | | | | | | | | | | | | | | | | |
| 78 | Small Boat Attack | | 1 | 36 | None | 0 | | | | | | | | | | | |
| | | | | | | | | | | | **pounds/year** | | **43111.648** | **33068.452** | **5467.6962** | **2135.1372** | **17940.771** |
| | | | | | | | | | | | **tons/year** | | **21.56** | **16.53** | **2.73** | **1.07** | **8.97** |

Assumptions: Assume that SH-60 and CH-46 operation for Cast and Recovery are Special Personnel Insertion and Extraction Rig operations.
Assume 4 hours of cruise time for Amphibious Raid Operations, and one touch and go operation
SH60 from AESO Memorandum Report No. 9929, February 1999
CH53 from AESO Memorandum Report No. 9822 Rev C, February 2000
CH46 from AESO Memorandum Report No. 9816 Rev F, January 2001
UH1N from AESO Memorandum Report No. 9904 Rev A, May 1999
AH-1W from AESO Memorandum Report No. 9824 Rev A, April 1999
Assume Aircraft participate for one day during Amphibious Raid Operations and Direct Action Operations
Assume 1 LTO and 3 hours of cruise for CQC/CQD SH-60 operation.
(a) Days = the number of days per operation
(b) Operations = the number of operations per year

| Scenario | Type Training | Reference | Days (a) | Operations (b) | Ship/Boat Type | Number | Ship Time on Range (hrs) (e) | Engines and Generators | | | | Ave. Speed (Knots) | Power Level (%) or horsepower | Engines on Line | Generator - Load (kW) | Emissions Factors (lb/hr) (c) | | | | | Emissions, (lbs/year) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Hours | Propulsion | No. | Generator | No. | | | | | CO | NOx | ROG | SOx | PM10 | CO | Nox | ROG | Sox | PM |
| **1.1.2** | **Conduct Maneuver - Move Forces** | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | Anchoring | | 1 | 72 | RHIB | 1 | 4 | Caterpillar 3126 Diesels | 2 | None | 0 | 1-2 | 600 | 2 | NA | 0.04 | 1.59 | 0.01 | 0.17 | 0.02 | 11.52 | 457.92 | 2.88 | 48.96 | 5.76 |
| | | | 1 | 72 | Ship (DDG or CG) | 1 | 4 | GE LM 2500 | 4 | Allison 501-K34, 2,000 kW ea | 3 | 4-6 | 2.5% | 2 | 2@1300kW ea | 102.98 | 47.34 | 8.10 | 17.04 | 2.35 | 29658.24 | 13633.92 | 2332.8 | 4907.52 | 676.8 |
| 2 | Towing | | 1 | 30 | Foss Tug | 1 | 4 | Foster Wheeler/ Babcock & Wilcox | 2 | NA - No separate emissions | 0 | 7 | 25% | 2 | NA | 1.85 | 10.89 | 1.38 | 32.76 | 6.57 | 221.44713 | 1306.538 | 166.0853 | 3930.686 | 788.9054 |
| | | | 1 | 30 | Ship (DDG or CG) | 1 | 4 | GE LM 2500 | 4 | Allison 501-K34, 2,000 kW ea | 3 | 4-6 | 2.5% | 2 | 2@1300kW ea | 102.98 | 47.34 | 8.10 | 17.04 | 2.35 | 12357.6 | 5680.8 | 972 | 2044.8 | 282 |
| 3 | Moor to Buoy | | 1 | 36 | RHIB | 1 | 4 | Caterpillar 3126 Diesels | 2 | None | 0 | 1-2 | 600 | 2 | NA | 0.04 | 1.59 | 0.01 | 0.17 | 0.02 | 5.76 | 228.96 | 1.44 | 24.48 | 2.88 |
| | | | 1 | 36 | Ship (DDG or CG) | 1 | 4 | GE LM 2500 | 4 | Allison 501-K34, 2,000 kW ea | 3 | 4-6 | 2.5% | 2 | 2@1300kW ea | 102.98 | 47.34 | 8.10 | 17.04 | 2.35 | 14829.12 | 6816.96 | 1166.4 | 2453.76 | 338.4 |
| **1.3.1** | **Perform Mine Countermeasures** | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | Parachute Operations | | 1 | 228 | RHIBs | 3 | 4 | Caterpillar 3126 Diesels | 2 | None | 0 | 1-2 | 600 | 2 | NA | 0.04 | 1.59 | 0.01 | 0.17 | 0.02 | 109.44 | 4350.24 | 27.36 | 465.12 | 54.72 |
| 5 | MCM Operations | | 1 | 58 | Zodiacs | 1 | 4 | OMC Outboard, 55 hp (d) | 1 | None | 0 | 2 | 600-800 | 1 | NA | 8.982561 | 0.859697 | 5.148482 | 0.002183 | 1.234617 | 2083.9542 | 199.4497 | 1194.448 | 0.50636 | 286.4312 |
| 6 | Floating Mine Operations | | 1 | 53 | RHIBs | 2 | 4 | Caterpillar 3126 Diesels | 2 | None | 0 | 1-2 | 600 | 2 | NA | 0.04 | 1.59 | 0.01 | 0.17 | 0.02 | 16.96 | 674.16 | 4.24 | 72.08 | 8.48 |
| 7 | Dive Platoon | | 1 | 8 | RHIB | 2 | 4 | Caterpillar 3126 Diesels | 2 | None | 0 | 1-2 | 600 | 2 | NA | 0.04 | 1.59 | 0.01 | 0.17 | 0.02 | 2.56 | 101.76 | 0.64 | 10.88 | 1.28 |
| 8 | Very Shallow Water (VSW) Operator Course | | 8 | 6 | RHIBs / Water-Jet Driven Craft | 2 | 2 | Caterpillar 3126 Diesels | 2 | None | 0 | 1-2 | 600 | 2 | NA | 0.04 | 1.59 | 0.01 | 0.17 | 0.02 | 7.68 | 305.28 | 1.92 | 32.64 | 3.84 |
| 9 | VSW Mine Countermeasure Operations | | 1 | 156 | RHIBs / Water-Jet Driven Craft | 3 | 2 | Caterpillar 3126 Diesels | 2 | None | 0 | 1-2 | 600 | 2 | NA | 0.04 | 1.59 | 0.01 | 0.17 | 0.02 | 37.44 | 1488.24 | 9.36 | 159.12 | 18.72 |
| 10 | Autonomous Underwater Vehicle (AUV) Operations/UUV Operatio | | 1 | 156 | RHIBs / Water-Jet Driven Craft | 2 | 2 | Caterpillar 3126 Diesels | 2 | None | 0 | 1-2 | 600 | 2 | NA | 0.04 | 1.59 | 0.01 | 0.17 | 0.02 | 24.96 | 992.16 | 6.24 | 106.08 | 12.48 |
| | | | 1 | 156 | Submersible | 2 | 2 | | | | | | | | | | | | | | | | | | |
| 11 | MK8 Marine Mammal/MMS Operations | | 1 | 208 | RHIBs / Water-Jet Driven Craft | 4 | 2 | Caterpillar 3126 Diesels | 2 | None | 0 | 1-2 | 600 | 2 | NA | 0.04 | 1.59 | 0.01 | 0.17 | 0.02 | 66.56 | 2645.76 | 16.64 | 282.88 | 33.28 |
| 12 | Mine Neutralization | | 1 | 4 | RHIBs / Water-Jet Driven Craft | 2 | 2 | Caterpillar 3126 Diesels | 2 | None | 0 | 1-2 | 600 | 2 | NA | 0.04 | 1.59 | 0.01 | 0.17 | 0.02 | 0.64 | 25.44 | 0.16 | 2.72 | 0.32 |
| N1 | Shock Wave Generator | | 1 | 90 | CRRC | 1 | 4 | OMC Outboard, 55 hp (d) | 1 | None | 0 | 2 | 600-800 | 1 | NA | 8.982561 | 0.859697 | 5.148482 | 0.002183 | 1.234617 | 3233.7221 | 309.4909 | 1853.454 | 0.785732 | 444.4622 |
| | | | 1 | 90 | LCM-8 | 1 | 4 | GM Detroit, V12-71N 460bhp | 2 | 3-71 GM Detroit, 40 kW | 2 | 10 | 2000 rpm (97%) | 2 | 2@ 7kW ea | 36.21 | 44.95 | 0.52 | 3.11 | 1.57 | 13035.6 | 16182 | 187.2 | 1119.6 | 565.2 |
| N2 | Surf Zone Test Detachment/Equipment T&E | | 1 | 200 | RHIB / Water-Jet Driven Craft / CRRC | 2 | 4 | Caterpillar 3126 Diesels | 2 | None | 0 | 1-2 | 600 | 2 | NA | 0.04 | 1.59 | 0.01 | 0.17 | 0.02 | 64 | 2544 | 16 | 272 | 32 |
| N3 | UUV Neutralization | | 1 | 4 | RHIBs | 2 | 2 | Caterpillar 3126 Diesels | 2 | None | 0 | 1-2 | 600 | 2 | NA | 0.04 | 1.59 | 0.01 | 0.17 | 0.02 | 0.64 | 25.44 | 0.16 | 2.72 | 0.32 |
| N4 | Mine Hunting | | 2 | 6 | Acoustic Explorer (mine seeding & maint | 1 | 12 | GM-16-V-92N Diesel | 2 | GM Detroit Diesel 6-71, 75 kW | 2 | 3 | 30% 550 rpm | 2 | 49 kW | 7.31 | 8.46 | 0.38 | 2.12 | 0.55 | 1052.64 | 1218.24 | 54.72 | 305.28 | 79.2 |
| N5 | Airborne Laser Mine Detection | | 1 | 48 | None | | | | | | | | | | | | | | | | | | | | |
| N6 | Organic Airborne Surface Influence Sweep | | 1 | 100 | None | | | | | | | | | | | | | | | | | | | | |
| N7 | Airborne Mine Neutralization | | 1 | 48 | RHIB | 1 | 12 | Caterpillar 3126 Diesels | 2 | None | 0 | 1-2 | 600 | 2 | NA | 0.04 | 1.59 | 0.01 | 0.17 | 0.02 | 23.04 | 915.84 | 5.76 | 97.92 | 11.52 |
| **1.4.6** | **Conduct Maritime Interception** | | | | | | | | | | | | | | | | | | | | | | | | |
| 13 | Visit, Board, Search and Seizure | | 1 | 42 | Foss Tug | 1 | 4 | Foster Wheeler/ Babcock & Wilcox | 2 | NA - No separate emissions | 0 | 7 | 25% | 2 | NA | 1.85 | 10.89 | 1.38 | 32.76 | 6.57 | 310.02598 | 1829.153 | 232.5195 | 5502.961 | 1104.468 |
| | | | 1 | 42 | RHIB | 1 | 4 | Caterpillar 3126 Diesels | 2 | None | 0 | 1-2 | 600 | 2 | NA | 0.04 | 1.59 | 0.01 | 0.17 | 0.02 | 6.72 | 267.12 | 1.68 | 28.56 | 3.36 |
| | | | 1 | 42 | Ship (DDG or CG) | 1 | 4 | GE LM 2500 | 4 | Allison 501-K34, 2,000 kW ea | 3 | 4-6 | 2.5% | 2 | 2@1300kW ea | 102.98 | 47.34 | 8.10 | 17.04 | 2.35 | 17300.64 | 7953.12 | 1360.8 | 2862.72 | 394.8 |
| **1.5.4** | **Conduct Amphibious Operations** | | | | | | | | | | | | | | | | | | | | | | | | |
| 14 | Small Boat Handling | | 1 | 94 | CRRC | 4 | 6 | OMC Outboard, 55 hp (d) | 1 | None | 0 | 2 | 600-800 | 1 | NA | 8.982561 | 0.859697 | 5.148482 | 0.002183 | 1.234617 | 20264.658 | 1939.477 | 11614.98 | 4.923918 | 2785.296 |
| 15 | Swimmer Conditioning - Bay and Ocean with fins | | 1 | 189 | Personal Watercraft / CRRC / RHIB | 1 | 1 | Yamaha Outboard, 160 hp (d) | 1 | None | 0 | 2 | 100% | 1 | NA | 26.13109 | 2.500937 | 14.9774 | 0.006349 | 3.591614 | 4938.7755 | 472.6771 | 2830.729 | 1.200026 | 678.815 |
| 16 | Basic Reconnaissance Course Final Mission | | 1 | 8 | IBS | 1 | 6 | OMC Outboard, 55 hp (d) | 1 | None | 0 | 2 | 600-800 | 1 | NA | 8.982561 | 0.859697 | 5.148482 | 0.002183 | 1.234617 | 431.16294 | 41.26546 | 247.1271 | 0.104764 | 59.26162 |
| | | | 1 | 8 | LCU | 1 | 6 | GM Detroit, V12-71N 460bhp | 2 | 3-71 GM Detroit, 40 kW | 2 | 10 | 2000 rpm (97%) | 2 | 2@ 7kW ea | 36.21 | 44.95 | 0.52 | 3.11 | 1.57 | 1738.08 | 2157.6 | 24.96 | 149.28 | 75.36 |
| 17 | Obstacle Course | | 1 | 142 | None | | | | | | | | | | | | | | | | | | | | |
| 18 | Hydrographic Reconnaissance | | 1 | 44 | Personal Watercraft | 1 | 6 | Yamaha Outboard, 160 hp (d) | 1 | None | 0 | 2 | 100% | 1 | NA | 26.13109 | 2.500937 | 14.9774 | 0.006349 | 3.591614 | 6898.6071 | 660.2474 | 3954.034 | 1.676227 | 948.186 |
| | | | 1 | 44 | Small Water Craft | 8 | 6 | OMC Outboard, 55 hp (d) | 1 | None | 0 | 2 | 600-800 | 1 | NA | 8.982561 | 0.859697 | 5.148482 | 0.002183 | 1.234617 | 18971.17 | 1815.68 | 10873.59 | 4.609625 | 2607.511 |
| | | | 1 | 44 | RHIB / CRRC | 1 | 6 | Caterpillar 3126 Diesels | 2 | None | 0 | 1-2 | 600 | 2 | NA | 0.04 | 1.59 | 0.01 | 0.17 | 0.02 | 10.56 | 419.76 | 2.64 | 44.88 | 5.28 |
| | | | 1 | 44 | rigid, 10-meter craft | 1 | 6 | Caterpillar 3126 Diesels | 2 | None | 0 | 1-2 | 600 | 2 | NA | 0.04 | 1.59 | 0.01 | 0.17 | 0.02 | 10.56 | 419.76 | 2.64 | 44.88 | 5.28 |
| 19 | Surf Observations (SUROBS) | | 1 | 116 | None | | | | | | | | | | | | | | | | | | | | |

| Scenario | Type Training | Reference | Days (a) | Operations (b) | Ship/Boat Type | Number | Ship Time on Range (hrs) (e) | Engines and Generators | | | | Ave. Speed (Knots) | Power Level (%) or horsepower | Engines on Line | Generator - Load (kW) | Emissions Factors (lb/hr) (c) | | | | | Emissions, (lbs/year) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Hours | Propulsion | No. | Generator | No. | | | | | CO | NOx | ROG | SOx | PM10 | CO | Nox | ROG | Sox | PM |
| 20 | CRRC Inflatable Boat Small (IBS)/Surf Passage/Boat Team Organ | | 1 | 72 | CRRC/Zodiac/Propeller Surface Craft/RH | 6 | 6 | OMC Outboard, 55 hp (d) | 1 | None | 0 | 2 | 600-800 | 1 | NA | 8.982561 | 0.859697 | 5.148482 | 0.002183 | 1.234617 | 23282.799 | 2228.335 | 13344.87 | 5.657268 | 3200.128 |
| | | | 1 | 72 | Personal Watercraft | 1 | 6 | Yamaha Outboard, 160 hp (d) | 1 | None | 0 | 2 | 100% | 1 | NA | 26.13109 | 2.500937 | 14.9774 | 0.006349 | 3.591614 | 11288.63 | 1080.405 | 6470.238 | 2.742918 | 1551.577 |
| 21 | CRRC Towing and High Speed Maneuver | | 1 | 8 | CRRC | 4 | 6 | OMC Outboard, 55 hp (d) | 1 | None | 0 | 2 | 600-800 | 1 | NA | 8.982561 | 0.859697 | 5.148482 | 0.002183 | 1.234617 | 1724.6518 | 165.0618 | 988.5086 | 0.419057 | 237.0465 |
| | | | 1 | 8 | Personal Watercraft | 1 | 6 | Yamaha Outboard, 160 hp (d) | 1 | None | 0 | 2 | 100% | 1 | NA | 26.13109 | 2.500937 | 14.9774 | 0.006349 | 3.591614 | 1254.2922 | 120.045 | 718.9153 | 0.304769 | 172.3975 |
| 22 | CRRC Bay Landing Craft Utility (LCU) Launch and Recover - Bay | | 1 | 24 | CRRC | 4 | 6 | OMC Outboard, 55 hp (d) | 1 | None | 0 | 2 | 600-800 | 1 | NA | 8.982561 | 0.859697 | 5.148482 | 0.002183 | 1.234617 | 5173.9553 | 495.1855 | 2965.526 | 1.257171 | 711.1395 |
| | | | 1 | 24 | Personal Watercraft | 1 | 6 | Yamaha Outboard, 160 hp (d) | 1 | None | 0 | 2 | 100% | 1 | NA | 26.13109 | 2.500937 | 14.9774 | 0.006349 | 3.591614 | 3762.8766 | 360.1349 | 2156.746 | 0.914306 | 517.1924 |
| | | | 1 | 24 | RHIB | 1 | 6 | Caterpillar 3126 Diesels | 2 | None | 0 | 1-2 | 600 | 2 | NA | 0.04 | 1.59 | 0.01 | 0.17 | 0.02 | 5.76 | 228.96 | 1.44 | 24.48 | 2.88 |
| | | | 1 | 24 | LCU | 1 | 6 | GM Detroit, V12-71N 460bhp | 2 | 3-71 GM Detroit, 40 kW | 2 | 10 | 2000 rpm (97%) | 2 | 2@ 7kW ea | 36.21 | 44.95 | 0.52 | 3.11 | 1.57 | 5214.24 | 6472.8 | 74.88 | 447.84 | 226.08 |
| 23 | CRRC Navigation, Bay and Ocean Runs | | 1 | 26 | CRRC | 6 | 6 | OMC Outboard, 55 hp (d) | 1 | None | 0 | 2 | 600-800 | 1 | NA | 8.982561 | 0.859697 | 5.148482 | 0.002183 | 1.234617 | 8407.6774 | 804.6765 | 4818.979 | 2.042902 | 1155.602 |
| | | | 1 | 26 | RHIB | 1 | 6 | Caterpillar 3126 Diesels | 2 | None | 0 | 1-2 | 600 | 2 | NA | 0.04 | 1.59 | 0.01 | 0.17 | 0.02 | 6.24 | 248.04 | 1.56 | 26.52 | 3.12 |
| 24 | Amphibious Raid Course Final Mission | | 1 | 24 | LCU | 2 | 2 | GM Detroit, V12-71N 460bhp | 2 | 3-71 GM Detroit, 40 kW | 2 | 10 | 2000 rpm (97%) | 2 | 2@ 7kW ea | 36.21 | 44.95 | 0.52 | 3.11 | 1.57 | 3476.16 | 4315.2 | 49.92 | 298.56 | 150.72 |
| | | | 1 | 24 | CRRCs | 12 | 2 | OMC Outboard, 55 hp (d) | 1 | None | 0 | 2 | 600-800 | 1 | NA | 8.982561 | 0.859697 | 5.148482 | 0.002183 | 1.234617 | 5173.9553 | 495.1855 | 2965.526 | 1.257171 | 711.1395 |
| 25 | Amphibious Raid Operations | | 3 | 18 | CRRCs | 13 | 2 | OMC Outboard, 55 hp (d) | 1 | None | 0 | 2 | 600-800 | 1 | NA | 8.982561 | 0.859697 | 5.148482 | 0.002183 | 1.234617 | 4203.8387 | 402.3382 | 2409.49 | 1.021451 | 577.8008 |
| | | | 3 | 18 | LPD | 1 | 2 | Foster Wheeler/ Babcock & Wilcox | 2 | NA - No separate emissions | 0 | 7 | 25% | 2 | NA | 1.85 | 10.89 | 1.38 | 32.76 | 6.57 | 66.434138 | 391.9614 | 49.8256 | 1179.206 | 236.6716 |
| | | | 3 | 18 | LCUs | 2 | 2 | GM Detroit, V12-71N 460bhp | 2 | 3-71 GM Detroit, 40 kW | 2 | 10 | 2000 rpm (97%) | 2 | 2@ 7kW ea | 36.21 | 44.95 | 0.52 | 3.11 | 1.57 | 2607.12 | 3236.4 | 37.44 | 223.92 | 113.04 |
| | | | 3 | 18 | LCACs | 2 | 2 | Avco Lycoming TF-40B 3,955 hp each | 4 | APU T-62-T-40-7 Sunstrand 60 kW each | 2 | 35 | 80% | 4 | 2@ 10kW ea | 25.41 | 55.32 | 0.72 | 43.30 | 3.89 | 1829.52 | 3983.04 | 51.84 | 3117.6 | 280.08 |
| | | | 3 | 18 | EFV | 6 | 2 | | | | | | | | | 2.0611 | 4.17 | 0.72 | 0.06 | 0.3211 | 445.1976 | 900.072 | 155.7576 | 13.6512 | 69.3576 |
| 26 | Direct Action (DA) Operations | | 3 | 18 | CRRCs | 9 | 2 | OMC Outboard, 55 hp (d) | 1 | None | 0 | 2 | 600-800 | 1 | NA | 8.982561 | 0.859697 | 5.148482 | 0.002183 | 1.234617 | 2910.3499 | 278.5419 | 1668.108 | 0.707158 | 400.016 |
| | | | 3 | 18 | LPD | 1 | 2 | Foster Wheeler/ Babcock & Wilcox | 2 | NA - No separate emissions | 0 | 7 | 25% | 2 | NA | 1.85 | 10.89 | 1.38 | 32.76 | 6.57 | 66.434138 | 391.9614 | 49.8256 | 1179.206 | 236.6716 |
| 27 | Craft Landing Zone (CLZ) | | 1 | 4 | 1 LCAC per CLZ | 1 | 2 | Avco Lycoming TF-40B 3,955 hp each | 4 | APU T-62-T-40-7 Sunstrand 60 kW each | 2 | 35 | 80% | 4 | 2@ 10kW ea | 25.41 | 55.32 | 0.72 | 43.30 | 3.89 | 203.28 | 442.56 | 5.76 | 346.4 | 31.12 |
| N8 | Tactical Recovery of Aircraft and Personnel | | 1 | 4 | None | | | | | | | | | | | | | | | | | | | | |
| **1.5.7** | **Conduct Naval Special Warfare** | | | | | | | | | | | | | | | | | | | | | | | | |
| 28 | Swimmer/Combat Rubber Raiding Craft Over-the-Beach | | 4 | 86 | RHIBs / CRRCs | 3 | 2 | Caterpillar 3126 Diesels | 2 | None | 0 | 1-2 | 600 | 2 | NA | 0.04 | 1.59 | 0.01 | 0.17 | 0.02 | 82.56 | 3281.76 | 20.64 | 350.88 | 41.28 |
| | | | 4 | 86 | Rigid, 10-meter craft | 1 | 2 | Caterpillar 3126 Diesels | 2 | None | 0 | 1-2 | 600 | 2 | NA | 0.04 | 1.59 | 0.01 | 0.17 | 0.02 | 27.52 | 1093.92 | 6.88 | 116.96 | 13.76 |
| 29 | Over-the-Beach Stalk | | 1 | 24 | CRRCs | 1 | 2 | OMC Outboard, 55 hp (d) | 1 | None | 0 | 2 | 600-800 | 1 | NA | 8.982561 | 0.859697 | 5.148482 | 0.002183 | 1.234617 | 431.16294 | 41.26546 | 247.1271 | 0.104764 | 59.26162 |
| | | | 1 | 24 | Boston Whaler | 1 | 2 | OMC Johnson Outboards (d) | 2 | None | 0 | 2-3 | 1000 | 2 | NA | 8.982561 | 0.859697 | 5.148482 | 0.002183 | 1.234617 | 431.16294 | 41.26546 | 247.1271 | 0.104764 | 59.26162 |
| 30 | Immediate Action Drills | | 1 | 12 | RHIBs | 1 | 2 | Caterpillar 3126 Diesels | 2 | None | 0 | 1-2 | 600 | 2 | NA | 0.04 | 1.59 | 0.01 | 0.17 | 0.02 | 0.96 | 38.16 | 0.24 | 4.08 | 0.48 |
| | | | 1 | 12 | CRRCs | 1 | 2 | OMC Outboard, 55 hp (d) | 1 | None | 0 | 2 | 600-800 | 1 | NA | 8.982561 | 0.859697 | 5.148482 | 0.002183 | 1.234617 | 215.58147 | 20.63273 | 123.5636 | 0.052382 | 29.63081 |
| 31 | Breacher Training | | 1 | 20 | None | 0 | | | | | | | | | | | | | | | | | | | |
| 32 | Amphibious Warfare Exercise | | 1 | 84 | RHIBs | 2 | 2 | Caterpillar 3126 Diesels | 2 | None | 0 | 1-2 | 600 | 2 | NA | 0.04 | 1.59 | 0.01 | 0.17 | 0.02 | 13.44 | 534.24 | 3.36 | 57.12 | 6.72 |
| | | | 1 | 84 | MK V | 2 | 2 | MTU 12V 396 TE94, 12 cyl | 2 | Northern Light, M844, 4 cyl 16 kW | 1 | 5-6 | 30% | 1 | 10 kW | 1.94 | 14.83 | 0.50 | 2.39 | 0.20 | 651.84 | 4982.88 | 168 | 803.04 | 67.2 |
| 33 | Mobility Primary Mission Area | | 1 | 200 | RHIB or MK V | 4 | 2 | Caterpillar 3126 Diesels | 2 | None | 0 | 1-2 | 600 | 2 | NA | 0.04 | 1.59 | 0.01 | 0.17 | 0.02 | 64 | 2544 | 16 | 272 | 32 |
| 34 | Escape and Evasion | | 1 | 84 | RHIBs | 2 | 2 | Caterpillar 3126 Diesels | 2 | None | 0 | 1-2 | 600 | 2 | NA | 0.04 | 1.59 | 0.01 | 0.17 | 0.02 | 13.44 | 534.24 | 3.36 | 57.12 | 6.72 |
| | | | 1 | 84 | MK V | 2 | 2 | MTU 12V 396 TE94, 12 cyl | 2 | Northern Light, M844, 4 cyl 16 kW | 1 | 5-6 | 30% | 1 | 10 kW | 1.94 | 14.83 | 0.50 | 2.39 | 0.20 | 651.84 | 4982.88 | 168 | 803.04 | 67.2 |
| N9 | Underwater Demolition Qualification / Certification | | 1 | 12 | RHIBs or CRRC | 2 | 2 | Caterpillar 3126 Diesels | 2 | None | 0 | 1-2 | 600 | 2 | NA | 0.04 | 1.59 | 0.01 | 0.17 | 0.02 | 1.92 | 76.32 | 0.48 | 8.16 | 0.96 |
| N10 | Vehicle Patrolling and Testing | | 1 | 50 | None | | | | | | | | | | | | | | | | | | | | |
| N11 | NSW Demolition Traning: Demolition Requalifications and Trainin | | 1 | 12 | CRRCs | 4 | 2 | OMC Outboard, 55 hp (d) | 1 | None | 0 | 2 | 600-800 | 1 | NA | 8.982561 | 0.859697 | 5.148482 | 0.002183 | 1.234617 | 862.32589 | 82.53092 | 494.2543 | 0.209528 | 118.5232 |
| **2.2.3** | **Perform Tactical Reconnaissance and Surveillance** | | | | | | | | | | | | | | | | | | | | | | | | |
| 35 | Helicopter Rope Suspension Training/Cast & Recovery Operation | | 1 | 154 | RHIBs | 1 | 2 | Caterpillar 3126 Diesels | 2 | None | 0 | 1-2 | 600 | 2 | NA | 0.04 | 1.59 | 0.01 | 0.17 | 0.02 | 12.32 | 489.72 | 3.08 | 52.36 | 6.16 |

Table C-12
Marine Vessel Emissions
Alternatives 1 and 2

| Scenario | Type Training | Reference | Days (a) | Operations (b) | Ship/Boat Type | Number | Ship Time on Range (hrs) (e) | Engines and Generators | | | | Ave. Speed (Knots) | Power Level (%) or horsepower | Engines on Line | Generator - Load (kW) | Emissions Factors (lb/hr) (c) | | | | | Emissions, (lbs/year) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Hours | Propulsion | No. | Generator | No. | | | | | CO | NOx | ROG | SOx | PM10 | CO | Nox | ROG | Sox | PM |
| | | | 1 | 154 | CRRCs | 2 | 2 | OMC Outboard, 55 hp (d) | 1 | None | 0 | 2 | 600-800 | 1 | NA | 8.982561 | 0.859697 | 5.148482 | 0.002183 | 1.234617 | 5533.2578 | 529.5734 | 3171.465 | 1.344474 | 760.5242 |
| 36 | Rappel and Fast Rope Training | | 1 | 11 | None | | | | | | | | | | | | | | | | | | | | |
| 37 | SEAL Delivery Vehicle (SDV)/Advanced Seal Delivery System (AS | | 14 | 40 | RHIBs | 2 | 2 | Caterpillar 3126 Diesels | 2 | None | 0 | 1-2 | 600 | 2 | NA | 0.04 | 1.59 | 0.01 | 0.17 | 0.02 | 89.6 | 3561.6 | 22.4 | 380.8 | 44.8 |
| **4.5.6** | **Construct, Maintain, and Operate Logistics Over-the-Shore** | | | | | | | | | | | | | | | | | | | | | | | | |
| 38 | OPDS | | 25 | 6 | OUBs | 2 | 4 | GM Detroit, V12-71N 460bhp | 2 | 3-71 GM Detroit, 40 kW | 2 | 10 | 2000 rpm (97%) | 2 | 2@ 7kW ea | 36.21 | 44.95 | 0.52 | 3.11 | 1.57 | 43452 | 53940 | 624 | 3732 | 1884 |
| 39 | Amphibious Bulk Liquid Transfer System (ABLTS) | | 10 | 5 | Warping Tug | 1 | 4 | Foster Wheeler/ Babcock & Wilcox | 2 | NA - No separate emissions | 0 | 7 | 25% | 2 | NA | 1.85 | 10.89 | 1.38 | 32.76 | 6.57 | 369.07854 | 2177.563 | 276.8089 | 6551.144 | 1314.842 |
| | | | 10 | 5 | Barge Ferry | 2 | 4 | Foster Wheeler/ Babcock & Wilcox | 2 | NA - No separate emissions | 0 | 7 | 25% | 2 | NA | 1.85 | 10.89 | 1.38 | 32.76 | 6.57 | 738.15708 | 4355.127 | 553.6178 | 13102.29 | 2629.685 |
| 40 | Barge Ferry/Causeway Coxswain Training | | 3 | 54 | Barge Ferry | 2 | 4 | Foster Wheeler/ Babcock & Wilcox | 2 | NA - No separate emissions | 0 | 7 | 25% | 2 | NA | 1.85 | 10.89 | 1.38 | 32.76 | 6.57 | 2391.629 | 14110.61 | 1793.722 | 42451.41 | 8520.178 |
| 41 | Causeway Pier Insertion and Retraction | | 5 | 10 | WTs | 4 | 4 | Foster Wheeler/ Babcock & Wilcox | 2 | NA - No separate emissions | 0 | 7 | 25% | 2 | NA | 1.85 | 10.89 | 1.38 | 32.76 | 6.57 | 1476.3142 | 8710.254 | 1107.236 | 26204.58 | 5259.369 |
| 42 | Elevated Causeway System (ELCAS) | | 10 | 4 | WTs | 2 | 4 | Foster Wheeler/ Babcock & Wilcox | 2 | NA - No separate emissions | 0 | 7 | 25% | 2 | NA | 1.85 | 10.89 | 1.38 | 32.76 | 6.57 | 590.52567 | 3484.101 | 442.8943 | 10481.83 | 2103.748 |
| | | | 10 | 4 | Personal Watercraft | 2 | 4 | Yamaha Outboard, 160 hp (d) | 1 | None | 0 | 2 | 100% | 1 | NA | 26.13109 | 2.500937 | 14.9774 | 0.006349 | 3.591614 | 8361.948 | 800.2998 | 4792.769 | 2.031791 | 1149.316 |
| | | | 10 | 4 | LCM | 1 | 4 | GM Detroit, V12-71N 460bhp | 2 | 3-71 GM Detroit, 40 kW | 2 | 10 | 2000 rpm (97%) | 2 | 2@ 7kW ea | 36.21 | 44.95 | 0.52 | 3.11 | 1.57 | 5793.6 | 7192 | 83.2 | 497.6 | 251.2 |
| 43 | Establish Beach Party Command Post | | 4 | 16 | None | | | | | | | | | | | | | | | | | | | | |
| 44 | Sterngate Marriage to Amphibious Ship/LCU | | 1 | 40 | LCU | 2 | 4 | GM Detroit, V12-71N 460bhp | 2 | 3-71 GM Detroit, 40 kW | 2 | 10 | 2000 rpm (97%) | 2 | 2@ 7kW ea | 36.21 | 44.95 | 0.52 | 3.11 | 1.57 | 11587.2 | 14384 | 166.4 | 995.2 | 502.4 |
| 45 | LCU/LCM Beaching | | 1 | 60 | LCU | 1 | 4 | GM Detroit, V12-71N 460bhp | 2 | 3-71 GM Detroit, 40 kW | 2 | 10 | 2000 rpm (97%) | 2 | 2@ 7kW ea | 36.21 | 44.95 | 0.52 | 3.11 | 1.57 | 8690.4 | 10788 | 124.8 | 746.4 | 376.8 |
| | | | 1 | 60 | LCM-8 | 1 | 4 | GM Detroit, V12-71N 460bhp | 2 | 3-71 GM Detroit, 40 kW | 2 | 10 | 2000 rpm (97%) | 2 | 2@ 7kW ea | 36.21 | 44.95 | 0.52 | 3.11 | 1.57 | 8690.4 | 10788 | 124.8 | 746.4 | 376.8 |
| 46 | LCU/LCM Towing/Being Towed | | 1 | 60 | LCU | 2 | 4 | GM Detroit, V12-71N 460bhp | 2 | 3-71 GM Detroit, 40 kW | 2 | 10 | 2000 rpm (97%) | 2 | 2@ 7kW ea | 36.21 | 44.95 | 0.52 | 3.11 | 1.57 | 17380.8 | 21576 | 249.6 | 1492.8 | 753.6 |
| | | | 1 | 60 | LCM-8 | 2 | 4 | GM Detroit, V12-71N 460bhp | 2 | 3-71 GM Detroit, 40 kW | 2 | 10 | 2000 rpm (97%) | 2 | 2@ 7kW ea | 36.21 | 44.95 | 0.52 | 3.11 | 1.57 | 17380.8 | 21576 | 249.6 | 1492.8 | 753.6 |
| 47 | Communications Training | | 2 | 2 | None | | | | | | | | | | | | | | | | | | | | |
| 48 | Field Training Exercise with a Beach Camp | | 14 | 2 | None | | | | | | | | | | | | | | | | | | | | |
| 49 | Maritime Pre-positioning Ships (MPS) Offload | | 5 | 2 | LCM-8 | 2 | 2 | GM Detroit, V12-71N 460bhp | 2 | 3-71 GM Detroit, 40 kW | 2 | 10 | 2000 rpm (97%) | 2 | 2@ 7kW ea | 36.21 | 44.95 | 0.52 | 3.11 | 1.57 | 1448.4 | 1798 | 20.8 | 124.4 | 62.8 |
| | | | 5 | 2 | WTs | 2 | 2 | Foster Wheeler/ Babcock & Wilcox | 2 | NA - No separate emissions | 0 | 7 | 25% | 2 | NA | 1.85 | 10.89 | 1.38 | 32.76 | 6.57 | 73.815708 | 435.5127 | 55.36178 | 1310.229 | 262.9685 |
| | | | 5 | 2 | Barge Ferry | 2 | 2 | Foster Wheeler/ Babcock & Wilcox | 2 | NA - No separate emissions | 0 | 7 | 25% | 2 | NA | 1.85 | 10.89 | 1.38 | 32.76 | 6.57 | 73.815708 | 435.5127 | 55.36178 | 1310.229 | 262.9685 |
| 50 | Reverse Osmosis Water Purification Unit | | 4 | 4 | None | | | | | | | | | | | | | | | | | | | | |
| 51 | Roll-on/Roll-off Discharge Facility | | 5 | 2 | WTs | 2 | 2 | Foster Wheeler/ Babcock & Wilcox | 2 | NA - No separate emissions | 0 | 7 | 25% | 2 | NA | 1.85 | 10.89 | 1.38 | 32.76 | 6.57 | 73.815708 | 435.5127 | 55.36178 | 1310.229 | 262.9685 |
| | | | 5 | 2 | Personal Watercraft | 2 | 2 | Yamaha Outboard, 160 hp (d) | 1 | None | 0 | 2 | 100% | 1 | NA | 26.13109 | 2.500937 | 14.9774 | 0.006349 | 3.591614 | 1045.2435 | 100.0375 | 599.0961 | 0.253974 | 143.6645 |
| 52 | MPF Utility Boat Operator Course | | 9 | 2 | MPF Utility Boat | 2 | 4 | Diesel Engines | 2 | None | 0 | 2 | 660 | 2 | NA | 20.46 | 4.4088 | 1.659306 | 1.353 | 1.452 | 2946.24 | 634.8672 | 238.9401 | 194.832 | 209.088 |
| 53 | LARC V Operator Training | | 6 | 1 | None | | | | | | | | | | | | | | | | | | | | |
| **4.9.1** | **Conduct Mission Area Training** | | | | | | | | | | | | | | | | | | | | | | | | |
| | **NSW Diving and Beach Operations** | | | | | | | | | | | | | | | | | | | | | | | | |
| 54 | Lung Automatic Rebreather (LAR) V Closed Circuit Breathing Divi | | 1 | 126 | RHIBs | 5 | 2 | Caterpillar 3126 Diesels | 2 | None | 0 | 1-2 | 600 | 2 | NA | 0.04 | 1.59 | 0.01 | 0.17 | 0.02 | 50.4 | 2003.4 | 12.6 | 214.2 | 25.2 |
| 55 | Open Circuit Breathing Diving | | 1 | 12 | RHIBs | 5 | 2 | Caterpillar 3126 Diesels | 2 | None | 0 | 1-2 | 600 | 2 | NA | 0.04 | 1.59 | 0.01 | 0.17 | 0.02 | 4.8 | 190.8 | 1.2 | 20.4 | 2.4 |
| | | | | | LCU | 1 | | | | | | | | | | | | | | | | | | | |
| 56 | OTB Field Training Exercise | | 5 | 36 | CRRCs | 5 | 2 | assume paddling | | | | | | | | | | | | | | | | | |
| 57 | Rock Portage | | 1 | 20 | CRRCs | 7 | 2 | assume paddling | | | | | | | | | | | | | | | | | |
| | | | 1 | 20 | IBS | 9 | 2 | OMC Outboard, 55 hp (d) | 1 | None | 0 | 2 | 600-800 | 1 | NA | 8.982561 | 0.859697 | 5.148482 | 0.002183 | 1.234617 | 3233.7221 | 309.4909 | 1853.454 | 0.785732 | 444.4622 |
| | **NSW Land Warfare** | | | | | | | | | | | | | | | | | | | | | | | | |
| 58 | Land Patrolling | | 1 | 18 | None | | | | | | | | | | | | | | | | | | | | |
| 59 | Immediate Action Drills | | 1 | 6 | None | | | | | | | | | | | | | | | | | | | | |
| | **NSW Advanced Training** | | | | | | | | | | | | | | | | | | | | | | | | |
| 60 | Over the Beach Insertion / Photo Reconnaissance | | 1 | 31 | RHIB/CRRC | 1 | 2 | Caterpillar 3126 Diesels | 2 | None | 0 | 1-2 | 600 | 2 | NA | 0.04 | 1.59 | 0.01 | 0.17 | 0.02 | 2.48 | 98.58 | 0.62 | 10.54 | 1.24 |
| | | | 1 | 31 | Kayak | 1 | 2 | assume paddling | | | | | | | | | | | | | | | | | |
| 61 | Photo Image Capture | | 14 | 4 | None | | | | | | | | | | | | | | | | | | | | |
| 62 | Field Skills (Observation Drill, Sketching, Range Estimation) | | 1 | 24 | None | | | | | | | | | | | | | | | | | | | | |
| 63 | Stalking, Movement and Hide-Sites | | 5 | 8 | None | | | | | | | | | | | | | | | | | | | | |
| 64 | CQC/CQD | | 1 | 198 | CRRCs | 5 | 2 | OMC Outboard, 55 hp (d) | 1 | None | 0 | 2 | 600-800 | 1 | NA | 8.982561 | 0.859697 | 5.148482 | 0.002183 | 1.234617 | 17785.471 | 1702.2 | 10193.99 | 4.321524 | 2444.542 |

| Scenario | Type Training | Reference | Days (a) | Operations (b) | Ship/Boat Type | Number | Ship Time on Range (hrs) (e) | Engines and Generators | | | | Ave. Speed (Knots) | Power Level (%) or horsepower | Engines on Line | Generator - Load (kW) | Emissions Factors (lb/hr) (c) | | | | | Emissions, (lbs/year) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Hours | Propulsion | No. | Generator | No. | | | | | CO | NOx | ROG | SOx | PM10 | CO | Nox | ROG | Sox | PM |
| 65 | Communications | | 5 | 6 | None | | | | | | | | | | | | | | | | | | | | |
| 66 | Unmanned Aerial Vehicle (UAV) Training | | 5 | 12 | None | | | | | | | | | | | | | | | | | | | | |
| 67 | Around the World Training | | 1 | 6 | CRRCs | 7 | 2 | assume paddling | | | | | | | | | | | | | | | | | |
| | | | 1 | 6 | Sea Kayaks | 5 | 2 | assume paddling | | | | | | | | | | | | | | | | | |
| **4.9.4** | **Provide/Execute Training for U.S. and Other Nation Units and** | | | | | | | | | | | | | | | | | | | | | | | | |
| 0 | **NSW Physical Fitness Training** | | | | | | | | | | | | | | | | | | | | | | | | |
| 68 | Physical Training Runs | | 1 | 464 | None | | | | | | | | | | | | | | | | | | | | |
| 69 | Physical Conditioning Training Exercise | | 1 | 280 | CRRCs / Propeller Surface Craft | 3 | 2 | assume paddling | | | | | | | | | | | | | | | | | |
| 70 | Swim Training | | 1 | 172 | RHIBs | 5 | 2 | assume paddling | | | | | | | | | | | | | | | | | |
| 71 | Hell Week | | 5 | 6 | CRRCs | 5 | 2 | OMC Outboard, 55 hp (d) | 1 | None | 0 | 2 | 600-800 | 1 | NA | 8.982561 | 0.859697 | 5.148482 | 0.002183 | 1.234617 | 2694.7684 | 257.9091 | 1544.545 | 0.654776 | 370.3851 |
| 72 | Rucksack March | | 1 | 54 | None | | | | | | | | | | | | | | | | | | | | |
| 73 | Monster Mash | | 1 | 6 | CRRCs | 3 | 2 | OMC Outboard, 55 hp (d) | 1 | None | 0 | 2 | 600-800 | 1 | NA | 8.982561 | 0.859697 | 5.148482 | 0.002183 | 1.234617 | 323.37221 | 30.94909 | 185.3454 | 0.078573 | 44.44622 |
| **4.12.6** | **Provide Industrial and Environmental Health Services** | | | | | | | | | | | | | | | | | | | | | | | | |
| 74 | Conduct Environmental Health Site Assessment | | 3 | 3 | None | | | | | | | | | | | | | | | | | | | | |
| **6.1.1** | **Conduct Explosive Ordnance Disposal** | | | | | | | | | | | | | | | | | | | | | | | | |
| 75 | Conventional Ordnance/Improvised Explosive Device Response | | 1 | 120 | None | | | | | | | | | | | | | | | | | | | | |
| 76 | Land Mine Detection/Neutralization | | 1 | 45 | None | | | | | | | | | | | | | | | | | | | | |
| **6.3.1** | **Force Protection: Protect and Secure Area of Operations** | | | | | | | | | | | | | | | | | | | | | | | | |
| 77 | Field Training Exercise (FTX) e.g. SEAHAWK | | 14 | 53 | Boston Whalers | 144 | 2 | OMC Johnson Outboards (d) | 2 | None | 0 | 2-3 | 1000 | 2 | NA | 8.982561 | 0.859697 | 5.148482 | 0.002183 | 1.234617 | 2586.9777 | 247.5928 | 1482.763 | 0.628585 | 355.5697 |
| **6.3.3** | **Combat Terrorism** | | | | | | | | | | | | | | | | | | | | | | | | |
| 78 | Small Boat Attack | | 1 | 36 | Boston Whalers | 1 | 2 | OMC Johnson Outboards (d) | 2 | None | 0 | 2-3 | 1000 | 2 | NA | 8.982561 | 0.859697 | 5.148482 | 0.002183 | 1.234617 | 646.74442 | 61.89819 | 370.6907 | 0.157146 | 88.89244 |
| | | | 1 | 36 | surface vessel dropping anchor and 3 sh | 1 | 2 | | | | | | | | | | | | | | | | | | |
| | | | 1 | 36 | 18' Bayliner | 1 | 2 | OMC Johnson Outboards (d) | 2 | None | 0 | 2-3 | 1000 | 2 | NA | 8.982561 | 0.859697 | 5.148482 | 0.002183 | 1.234617 | 646.74442 | 61.89819 | 370.6907 | 0.157146 | 88.89244 |
| | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | lbs/year | | | 398450.49 | 310640.47 | 110477.01 | 147766 | 55158.904 |
| | | | | | | | | | | | | | | | | | | tons/year | | | 199.23 | 155.32 | 55.24 | 73.88 | 27.58 |

Assume marine vessels participate for one day during Amphibious Raid Operations and Direct Action Operations and Seahawk
Assumptions: Watercraft operates 8 hours per day for the days during which the operation occurs

Table C-13
Ground Vehicle Emissions
Alternatives 1 and 2

| Scenario | Type Training | Reference | Days (a) | Operations (b) | Ground Vehicles | Number | Engine Load | Hours per day | Horsepower | Emissions Factors (lb/hr) | | | | | Emissions (lbs) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | CO | NOx | ROG | SOx | PM10 | CO | Nox | ROG | Sox | PM |
| **1.1.2** | **Conduct Maneuver - Move Forces** | | | | | | | | | | | | | | | | | | |
| 1 | Anchoring | | 1 | 72 | None | | | | | | | | | | | | | | |
| 2 | Towing | | 1 | 30 | None | | | | | | | | | | | | | | |
| 3 | Moor to Buoy | | 1 | 36 | None | | | | | | | | | | | | | | |
| **1.3.1** | **Perform Mine Countermeasures** | | | | | | | | | | | | | | | | | | |
| 4 | Parachute Operations | | 1 | 228 | 4WD Pickups | 2 | | 2 | | 0.20 | 0.02 | 0.01 | 0.00 | 0.00 | 184.22 | 15.41 | 11.04 | 0.21 | 0.93 |
| 5 | MCM Operations | | 1 | 58 | 4WD Pickups | 2 | | 2 | | 0.20 | 0.02 | 0.01 | 0.00 | 0.00 | 46.86 | 3.92 | 2.81 | 0.05 | 0.24 |
| 6 | Floating Mine Operations | | 1 | 53 | 4WD Pickups | 1 | | 2 | | 0.20 | 0.02 | 0.01 | 0.00 | 0.00 | 21.41 | 1.79 | 1.28 | 0.02 | 0.11 |
| 7 | Dive Platoon | | 1 | 8 | None | | | | | | | | | | | | | | |
| 8 | Very Shallow Water (VSW) Operator Course | | 8 | 6 | None | | | | | | | | | | | | | | |
| 9 | VSW Mine Countermeasure Operations | | 1 | 156 | None | | | | | | | | | | | | | | |
| 10 | Autonomous Underwater Vehicle (AUV) Operations/UUV Operations | | 1 | 156 | None | | | | | | | | | | | | | | |
| 11 | MK8 Marine Mammal/MMS Operations | | 1 | 208 | 4WD Pickups | 0 | | 2 | | 0.20 | 0.02 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 12 | Mine Neutralization | | 1 | 4 | 4WD Pickups | 2 | | 2 | | 0.20 | 0.02 | 0.01 | 0.00 | 0.00 | 3.23 | 0.27 | 0.19 | 0.00 | 0.02 |
| N1 | Shock Wave Generator | | 1 | 90 | 4WD Pickups | 1 | | 2 | | 0.20 | 0.02 | 0.01 | 0.00 | 0.00 | 36.36 | 3.04 | 2.18 | 0.04 | 0.18 |
| N2 | Surf Zone Test Detachment/Equipment T&E | | 1 | 200 | 4WD Pickups | 1 | | 2 | | 0.20 | 0.02 | 0.01 | 0.00 | 0.00 | 80.80 | 6.76 | 4.84 | 0.09 | 0.41 |
| N3 | UUV Neutralization | | 1 | 4 | 4WD Pickups | 2 | | 2 | | 0.20 | 0.02 | 0.01 | 0.00 | 0.00 | 3.23 | 0.27 | 0.19 | 0.00 | 0.02 |
| N4 | Mine Hunting | | 1 | 200 | None | | | | | | | | | | | | | | |
| N5 | Airborne Laser Mine Detection | | 1 | 48 | None | | | | | | | | | | | | | | |
| N6 | Organic Airborne Surface Influence Sweep | | 1 | 100 | None | | | | | | | | | | | | | | |
| N7 | Airborne Mine Neutralization | | 1 | 48 | None | | | | | | | | | | | | | | |
| **1.4.6** | **Conduct Maritime Interception** | | | | | | | | | | | | | | | | | | |
| 13 | Visit, Board, Search and Seizure | | 1 | 42 | None | | | | | | | | | | | | | | |
| **1.5.4** | **Conduct Amphibious Operations** | | | | | | | | | | | | | | | | | | |
| 14 | Small Boat Handling | | 1 | 94 | HMMWV | 1 | 65% | 3 | | 0.18 | 2.06 | 0.60 | 0.19 | 0.17 | 33.88 | 378.24 | 110.32 | 35.07 | 31.52 |
| 15 | Swimmer Conditioning - Bay and Ocean with fins | | 1 | 189 | HMMWV | 1 | 65% | 3 | | 0.18 | 2.06 | 0.60 | 0.19 | 0.17 | 68.13 | 760.51 | 221.82 | 70.51 | 63.38 |
| | | | 1 | 189 | Truck | 1 | 80% | 1 | | 0.25 | 0.30 | 0.02 | 0.00 | 0.01 | 37.08 | 45.03 | 3.20 | 0.07 | 2.16 |
| 16 | Basic Reconnaissance Course Final Mission | | 1 | 8 | None | | | | | | | | | | | | | | |
| 17 | Obstacle Course | | 1 | 142 | 4WD Pickups | 2 | | 2 | | 0.20 | 0.02 | 0.01 | 0.00 | 0.00 | 114.74 | 9.60 | 6.87 | 0.13 | 0.58 |
| 18 | Hydrographic Reconnaissance | | 1 | 44 | 4WD Pickups | 3 | | 2 | | 0.20 | 0.02 | 0.01 | 0.00 | 0.00 | 53.33 | 4.46 | 3.19 | 0.06 | 0.27 |
| 19 | Surf Observations (SUROBS) | | 1 | 116 | 4WD Pickups | 2 | | 2 | | 0.20 | 0.02 | 0.01 | 0.00 | 0.00 | 93.73 | 7.84 | 5.61 | 0.11 | 0.48 |
| 20 | CRRC Inflatable Boat Small (IBS)/Surf Passage/Boat Team Organization and Function | | 1 | 72 | HMMWV/ 4WD Pickups | 2 | 65% | 3 | | 0.18 | 2.06 | 0.60 | 0.19 | 0.17 | 51.91 | 579.44 | 169.00 | 53.72 | 48.29 |
| 21 | CRRC Towing and High Speed Maneuver | | 1 | 8 | 4WD Pickups / HMMWV | 1 | | 2 | | 0.20 | 0.02 | 0.01 | 0.00 | 0.00 | 3.23 | 0.27 | 0.19 | 0.00 | 0.02 |
| 22 | CRRC Bay Landing Craft Utility (LCU) Launch and Recover - Bay and Ocean | | 1 | 24 | 4WD Pickups / HMMWV | 1 | | 2 | | 0.20 | 0.02 | 0.01 | 0.00 | 0.00 | 9.70 | 0.81 | 0.58 | 0.01 | 0.05 |
| 23 | CRRC Navigation, Bay and Ocean Runs | | 1 | 26 | 4WD Pickups / HMMWV | 1 | | 8 | | 0.20 | 0.02 | 0.01 | 0.00 | 0.00 | 42.02 | 3.52 | 2.52 | 0.05 | 0.21 |
| 24 | Amphibious Raid Course Final Mission | | 1 | 24 | None | 0 | | | | | | | | | | | | | |
| 25 | Amphibious Raid Operations | | 3 | 18 | HMMWVs | 6 | 65% | 3 | | 0.18 | 2.06 | 0.60 | 0.19 | 0.17 | 116.79 | 1303.74 | 380.26 | 120.87 | 108.64 |
| | | | 3 | 18 | 4WD Pickups | 8 | | 8 | | 0.20 | 0.02 | 0.01 | 0.00 | 0.00 | 698.11 | 58.41 | 41.82 | 0.80 | 3.54 |
| | | | 3 | 18 | AAVs | 6 | | 2 | | 0.444918 | 1.0 | 0.2 | 0.1 | 0.2 | 288.31 | 671.38 | 112.81 | 33.36 | 116.07 |
| | | | 3 | 18 | LAVs | 6 | 65% | 2 | | 0.04 | 0.06 | 0.01 | 0.00 | 0.01 | 18.60 | 27.28 | 3.60 | 0.07 | 2.55 |
| | | | 3 | 18 | IFAVs | 6 | 65% | 2 | | 0.04 | 0.06 | 0.01 | 0.00 | 0.01 | 18.60 | 27.28 | 3.60 | 0.07 | 2.55 |
| 26 | Direct Action (DA) Operations | | 3 | 18 | Light Wheeled Vehicles | 16 | | 2 | | 0.20 | 0.02 | 0.01 | 0.00 | 0.00 | 349.06 | 29.20 | 20.91 | 0.40 | 1.77 |
| 27 | Craft Landing Zone (CLZ) | | 1 | 4 | HMMWVs | 1 | 65% | 3 | | 0.18 | 2.06 | 0.60 | 0.19 | 0.17 | 1.44 | 16.10 | 4.69 | 1.49 | 1.34 |
| N8 | Tactical Recovery of Aircraft and Personnel | | 1 | 4 | 4WD Pickups | 9 | | 2 | | 0.20 | 0.02 | 0.01 | 0.00 | 0.00 | 14.54 | 1.22 | 0.87 | 0.02 | 0.07 |
| **1.5.7** | **Conduct Naval Special Warfare** | | | | | | | | | | | | | | | | | | |
| 28 | Swimmer/Combat Rubber Raiding Craft Over-the-Beach | | 4 | 86 | 4WD Pickups | 3 | | 2 | | 0.20 | 0.02 | 0.01 | 0.00 | 0.00 | 416.93 | 34.88 | 24.97 | 0.48 | 2.12 |
| 29 | Over-the-Beach Stalk | | 1 | 24 | 4WD Pickups | 1 | | 2 | | 0.20 | 0.02 | 0.01 | 0.00 | 0.00 | 9.70 | 0.81 | 0.58 | 0.01 | 0.05 |
| 30 | Immediate Action Drills | | 1 | 12 | 4WD Pickups | 4 | | 2 | | 0.20 | 0.02 | 0.01 | 0.00 | 0.00 | 19.39 | 1.62 | 1.16 | 0.02 | 0.10 |
| 31 | Breacher Training | | 1 | 20 | 4WD Pickups | 3 | | 2 | | 0.20 | 0.02 | 0.01 | 0.00 | 0.00 | 24.24 | 2.03 | 1.45 | 0.03 | 0.12 |
| 32 | Amphibious Warfare Exercise | | 1 | 84 | None | 0 | | | | | | | | | | | | | |
| 33 | Mobility Primary Mission Area | | 1 | 200 | None | 0 | | | | | | | | | | | | | |
| 34 | Escape and Evasion | | 1 | 84 | None | 0 | | | | | | | | | | | | | |
| N9 | Underwater Demolition Qualification / Certification | | 1 | 12 | 4WD Pickups | 2 | | 2 | | 0.20 | 0.02 | 0.01 | 0.00 | 0.00 | 9.70 | 0.81 | 0.58 | 0.01 | 0.05 |
| N10 | Vehicle Patrolling and Testing | | 1 | 50 | HMMVS | 6 | 65% | 3 | | 0.18 | 2.06 | 0.60 | 0.19 | 0.17 | 108.14 | 1207.16 | 352.09 | 111.91 | 100.60 |
| N11 | NSW Demolition Traning: Demolition Requalifications and Training (Underwater Detonations) | | 1 | 12 | 4WD Pickups | 1 | | 2 | | 0.20 | 0.02 | 0.01 | 0.00 | 0.00 | 4.85 | 0.41 | 0.29 | 0.01 | 0.02 |
| **2.2.3** | **Perform Tactical Reconnaissance and Surveillance** | | | | | | | | | | | | | | | | | | |
| 35 | Helicopter Rope Suspension Training/Cast & Recovery Operation | | 1 | 154 | 4WD Pickups | 2 | | 2 | | 0.20 | 0.02 | 0.01 | 0.00 | 0.00 | 124.43 | 10.41 | 7.45 | 0.14 | 0.63 |
| 36 | Rappel and Fast Rope Training | | 1 | 11 | 4WD Pickups | 4 | | 2 | | 0.20 | 0.02 | 0.01 | 0.00 | 0.00 | 17.78 | 1.49 | 1.06 | 0.02 | 0.09 |
| 37 | SEAL Delivery Vehicle (SDV)/Advanced Seal Delivery System (ASDS) Certification to Deploy | | 14 | 40 | 4WD Pickups | 2 | | 2 | | 0.20 | 0.02 | 0.01 | 0.00 | 0.00 | 452.48 | 37.86 | 27.10 | 0.52 | 2.30 |
| **4.5.6** | **Construct, Maintain, and Operate Logistics Over-the-Shore** | | | | | | | | | | | | | | | | | | |
| 38 | OPDS | | 25 | 6 | HMMWVs | 1 | 65% | 3 | | 0.18 | 2.06 | 0.60 | 0.19 | 0.17 | 54.07 | 603.58 | 176.04 | 55.96 | 50.30 |
| | | | 25 | 6 | 5-ton truck | 1 | 80% | 1 | | 0.25 | 0.30 | 0.02 | 0.00 | 0.01 | 29.43 | 35.74 | 2.54 | 0.06 | 1.72 |
| | | | 25 | 6 | Dozer | 2 | 59% | 8 | 240.0 | 0.01 | 0.02 | 0.00 | 0.00 | 0.00 | 1955.47 | 6211.06 | 696.78 | 4.50 | 368.62 |
| | | | 25 | 6 | Comm Van | 1 | | 8 | | 0.20 | 0.02 | 0.01 | 0.00 | 0.00 | 242.40 | 20.28 | 14.52 | 0.28 | 1.23 |
| | | | 25 | 6 | RTV forklift | 1 | 48% | 8 | 93.0 | 0.01 | 0.02 | 0.00 | 0.00 | 0.00 | 483.83 | 882.35 | 149.59 | 0.82 | 80.64 |
| | | | 25 | 6 | LARCV | 2 | | 2 | 350.0 | 10.85 | 2.338 | 0.879935 | 0.7175 | 0.77 | 6510.00 | 1402.80 | 527.96 | 430.50 | 462.00 |
| 39 | Amphibious Bulk Liquid Transfer System (ABLTS) | | 10 | 5 | HMMWVs | 1 | 65% | 3 | | 0.18 | 2.06 | 0.60 | 0.19 | 0.17 | 18.02 | 201.19 | 58.68 | 18.65 | 16.77 |
| | | | 10 | 5 | 5-ton truck | 1 | 80% | 1 | | 0.25 | 0.30 | 0.02 | 0.00 | 0.01 | 9.81 | 11.91 | 0.85 | 0.02 | 0.57 |
| | | | 10 | 5 | Van | 1 | | 8 | | 0.20 | 0.02 | 0.01 | 0.00 | 0.00 | 80.80 | 6.76 | 4.84 | 0.09 | 0.41 |
| | | | 10 | 5 | Dozers | 2 | 59% | 8 | 240.0 | 0.01 | 0.02 | 0.00 | 0.00 | 0.00 | 651.82 | 2070.35 | 232.26 | 1.50 | 122.87 |
| | | | 10 | 5 | Rough Terrain Forklift | 1 | 48% | 8 | 37.0 | 0.01 | 0.02 | 0.00 | 0.00 | 0.00 | 64.84 | 118.25 | 20.05 | 0.11 | 10.81 |
| | | | 10 | 5 | LARCV | 2 | | 2 | 350.0 | 10.85 | 2.338 | 0.879935 | 0.7175 | 0.77 | 2170.00 | 467.60 | 175.99 | 143.50 | 154.00 |
| 40 | Barge Ferry/Causeway Coxswain Training | | 3 | 54 | HMMWVs | 1 | 65% | 3 | | 0.18 | 2.06 | 0.60 | 0.19 | 0.17 | 58.40 | 651.87 | 190.13 | 60.43 | 54.32 |
| | | | 3 | 54 | 5-ton truck | 1 | 80% | 1 | | 0.25 | 0.30 | 0.02 | 0.00 | 0.01 | 31.78 | 38.59 | 2.74 | 0.06 | 1.85 |
| | | | 3 | 54 | Van | 1 | | 8 | | 0.20 | 0.02 | 0.01 | 0.00 | 0.00 | 98.17 | 21.90 | 15.68 | 0.30 | 1.33 |
| | | | 3 | 54 | Dozer | 2 | 59% | 8 | 240.0 | 0.01 | 0.02 | 0.00 | 0.00 | 0.00 | 2111.91 | 6707.94 | 752.52 | 4.85 | 398.11 |
| | | | 3 | 54 | LARCV | 2 | | 2 | 350.0 | 10.85 | 2.338 | 0.879935 | 0.7175 | 0.77 | 7030.80 | 1515.02 | 570.20 | 464.94 | 498.96 |
| 41 | Causeway Pier Insertion and Retraction | | 5 | 10 | HMMWVs | 2 | 65% | 3 | | 0.18 | 2.06 | 0.60 | 0.19 | 0.17 | 36.05 | 402.39 | 117.36 | 37.30 | 33.53 |
| | | | 5 | 10 | 5-ton truck | 1 | 80% | 1 | | 0.25 | 0.30 | 0.02 | 0.00 | 0.01 | 9.81 | 11.91 | 0.85 | 0.02 | 0.57 |
| | | | 5 | 10 | Van | 1 | | 8 | | 0.20 | 0.02 | 0.01 | 0.00 | 0.00 | 80.80 | 6.76 | 4.84 | 0.09 | 0.41 |
| | | | 5 | 10 | Rough Terrain Forklift | 1 | 48% | 8 | 37.0 | 0.01 | 0.02 | 0.00 | 0.00 | 0.00 | 64.84 | 118.25 | 20.05 | 0.11 | 10.81 |
| | | | 5 | 10 | Dozers | 2 | 59% | 8 | 240.0 | 0.01 | 0.02 | 0.00 | 0.00 | 0.00 | 651.82 | 2070.35 | 232.26 | 1.50 | 122.87 |
| | | | 5 | 10 | LARCV | 2 | | 2 | 350.0 | 10.85 | 2.338 | 0.879935 | 0.7175 | 0.77 | 2170.00 | 467.60 | 175.99 | 143.50 | 154.00 |

| Scenario | Type Training | Reference | Days (a) | Operations (b) | Ground Vehicles | Number | Engine Load | Hours per day | Horsepower | Emissions Factors (lb/hr) | | | | | Emissions (lbs) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | CO | NOx | ROG | SOx | PM10 | CO | Nox | ROG | Sox | PM |
| 42 | Elevated Causeway System (ELCAS) | | 10 | 4 | HMMWVs | 4 | 65% | 3 | | 0.18 | 2.06 | 0.60 | 0.19 | 0.17 | 57.68 | 643.82 | 187.78 | 59.69 | 53.65 |
| | | | 10 | 4 | 5-ton truck | 3 | 80% | 1 | | 0.25 | 0.30 | 0.02 | 0.00 | 0.01 | 23.54 | 28.59 | 2.03 | 0.04 | 1.37 |
| | | | 10 | 4 | Light Trucks | 4 | 62% | 8 | 161.0 | 0.01 | 0.02 | 0.00 | 0.00 | 0.00 | 983.08 | 1943.63 | 278.87 | 255.54 | 194.36 |
| | | | 10 | 4 | Dozers | 2 | 59% | 8 | 240.0 | 0.01 | 0.02 | 0.00 | 0.00 | 0.00 | 521.46 | 1656.28 | 185.81 | 1.20 | 98.30 |
| | | | 10 | 4 | Forklifts | 1 | 48% | 8 | 37.0 | 0.01 | 0.02 | 0.00 | 0.00 | 0.00 | 51.87 | 94.60 | 16.04 | 0.09 | 8.65 |
| | | | 10 | 4 | 75-Ton Crane | 2 | 74% | 8 | 194.0 | 0.00 | 0.02 | 0.00 | 0.00 | 0.00 | 397.01 | 1423.98 | 141.79 | 1.22 | 54.69 |
| | | | 10 | 4 | Pile Driver | 2 | 30% | 24 | 20.0 | 0.01 | 0.01 | 0.00 | 0.00 | 0.00 | 60.95 | 121.15 | 19.05 | 0.18 | 7.21 |
| | | | 10 | 4 | ambulance | 1 | | 8 | | 0.20 | 0.02 | 0.01 | 0.00 | 0.00 | 64.64 | 5.41 | 3.87 | 0.07 | 0.33 |
| | | | 10 | 4 | water buffalo | 1 | 80% | 1 | | 0.25 | 0.30 | 0.02 | 0.00 | 0.01 | 7.85 | 9.53 | 0.68 | 0.01 | 0.46 |
| | | | 10 | 4 | 140-ton crane | 1 | 74% | 8 | 399.0 | 0.00 | 0.02 | 0.00 | 0.00 | 0.00 | 408.27 | 1464.36 | 145.81 | 1.25 | 56.24 |
| | | | 10 | 4 | 30-ton crane | 2 | 74% | 8 | 194.0 | 0.00 | 0.02 | 0.00 | 0.00 | 0.00 | 397.01 | 1423.98 | 141.79 | 1.22 | 54.69 |
| | | | 10 | 4 | LARCV | 2 | | 2 | 350.0 | 10.85 | 2.338 | 0.879935 | 0.7175 | 0.77 | 1736.00 | 374.08 | 140.79 | 114.80 | 123.20 |
| | | | 10 | 4 | Air compressors | 2 | 48% | 8 | 106.0 | 0.01 | 0.02 | 0.00 | 0.00 | 0.00 | 292.90 | 557.09 | 94.76 | 0.50 | 49.25 |
| | | | 10 | 4 | Pile Extractor | 1 | 30% | 24 | 20.0 | 0.01 | 0.01 | 0.00 | 0.00 | 0.00 | 30.48 | 60.57 | 9.52 | 0.09 | 3.61 |
| 43 | Establish Beach Party Command Post | | 4 | 16 | HMMWVs | 3 | 65% | 3 | | 0.18 | 2.06 | 0.60 | 0.19 | 0.17 | 69.21 | 772.58 | 225.34 | 71.63 | 64.38 |
| | | | 4 | 16 | 5-ton truck | 1 | 80% | 1 | | 0.25 | 0.30 | 0.02 | 0.00 | 0.01 | 12.55 | 15.25 | 1.08 | 0.02 | 0.73 |
| | | | 4 | 16 | Dozer | 1 | 59% | 8 | 240.0 | 0.01 | 0.02 | 0.00 | 0.00 | 0.00 | 417.17 | 1325.03 | 148.65 | 0.96 | 78.64 |
| | | | 4 | 16 | Generators/various | 2 | 30% | 24 | Various | 11.98 | 55.59 | 4.52 | 3.67 | 3.93 | 5519.25 | 25617.23 | 2084.62 | 1689.14 | 1809.07 |
| | | | 4 | 16 | Heaters | 2 | 51% | 8 | 238.0 | 0.00 | 0.02 | 0.00 | 0.00 | 0.00 | 463.10 | 1866.08 | 172.63 | 1.64 | 64.67 |
| | | | 4 | 16 | LARCV | 2 | | 2 | 350.0 | 10.85 | 2.338 | 0.879935 | 0.7175 | 0.77 | 2777.60 | 598.53 | 225.26 | 183.68 | 197.12 |
| 44 | Sterngate Marriage to Amphibious Ship/LCU | | 1 | 40 | None | 0 | | | | | | | | | | | | | |
| 45 | LCU/LCM Beaching | | 1 | 60 | HMMWVs | 1 | 65% | 3 | | 0.18 | 2.06 | 0.60 | 0.19 | 0.17 | 21.63 | 241.43 | 70.42 | 22.38 | 20.12 |
| | | | 1 | 60 | 5-ton truck | 1 | 80% | 1 | | 0.25 | 0.30 | 0.02 | 0.00 | 0.01 | 11.77 | 14.29 | 1.01 | 0.02 | 0.69 |
| | | | 1 | 60 | Dozer | 1 | 59% | 8 | 240.0 | 0.01 | 0.02 | 0.00 | 0.00 | 0.00 | 391.09 | 1242.21 | 139.36 | 0.90 | 73.72 |
| | | | 1 | 60 | LARCV | 1 | | 2 | 350.0 | 10.85 | 2.338 | 0.879935 | 0.7175 | 0.77 | 1302.00 | 280.56 | 105.59 | 86.10 | 92.40 |
| 46 | LCU/LCM Towing/Being Towed | | 1 | 60 | Dozer | 1 | 59% | 8 | 240.0 | 0.01 | 0.02 | 0.00 | 0.00 | 0.00 | 391.09 | 1242.21 | 139.36 | 0.90 | 73.72 |
| 47 | Communications Training | | 2 | 2 | 4WD Pickups | 4 | | 2 | | 0.20 | 0.02 | 0.01 | 0.00 | 0.00 | 6.46 | 0.54 | 0.39 | 0.01 | 0.03 |
| | | | 2 | 2 | RTVs | 4 | 48% | 8 | 93.0 | 0.01 | 0.02 | 0.00 | 0.00 | 0.00 | 51.61 | 94.12 | 15.96 | 0.09 | 8.60 |
| | | | 2 | 2 | Bus | 2 | | 2 | | 0.21 | 0.74 | 0.04 | 0.00 | 0.02 | 3.28 | 11.85 | 0.66 | 0.01 | 0.27 |
| | | | 2 | 2 | Tractor with flat bed | 1 | 80% | 1 | | 0.25 | 0.30 | 0.02 | 0.00 | 0.01 | 0.78 | 0.95 | 0.07 | 0.00 | 0.05 |
| 48 | Field Training Exercise with a Beach Camp | | 14 | 2 | HMMWVs | 2 | 65% | 3 | | 0.18 | 2.06 | 0.60 | 0.19 | 0.17 | 20.19 | 225.34 | 65.72 | 20.89 | 18.78 |
| | | | 14 | 2 | 5-ton truck | 1 | 80% | 1 | | 0.25 | 0.30 | 0.02 | 0.00 | 0.01 | 5.49 | 6.67 | 0.47 | 0.01 | 0.32 |
| | | | 14 | 2 | Dozer | 2 | 59% | 8 | 240.0 | 0.01 | 0.02 | 0.00 | 0.00 | 0.00 | 365.02 | 1159.40 | 130.07 | 0.84 | 68.81 |
| | | | 14 | 2 | 4WD Pickups | 10 | | 2 | | 0.20 | 0.02 | 0.01 | 0.00 | 0.00 | 113.12 | 9.46 | 6.78 | 0.13 | 0.57 |
| | | | 14 | 2 | Fuel Truck | 1 | | 2 | | 0.20 | 0.02 | 0.01 | 0.00 | 0.00 | 11.31 | 0.95 | 0.68 | 0.01 | 0.06 |
| | | | 14 | 2 | 20-ton Stake Trucks | 1 | | 2 | | 0.10 | 0.46 | 0.02 | 0.01 | 0.02 | 5.77 | 25.64 | 1.00 | 0.33 | 1.04 |
| | | | 14 | 2 | 50-ton Low-bed Trucks | 1 | | 2 | | 0.10 | 0.46 | 0.02 | 0.01 | 0.02 | 5.77 | 25.64 | 1.00 | 0.33 | 1.04 |
| | | | 14 | 2 | Wheeled Loaders | 2 | 47% | 8 | 147.0 | 0.01 | 0.02 | 0.00 | 0.00 | 0.00 | 230.22 | 470.56 | 60.09 | 0.41 | 26.46 |
| | | | 14 | 2 | Generators/various | 23 | 30% | 24 | Various | 11.98 | 55.59 | 4.52 | 3.67 | 3.93 | 2414.67 | 11207.54 | 912.02 | 739.00 | 791.47 |
| | | | 14 | 2 | Heaters | 117 | 51% | 8 | 238.0 | 0.00 | 0.02 | 0.00 | 0.00 | 0.00 | | | | | |
| | | | 14 | 2 | Welder | 6 | 45% | 8 | 45.0 | 0.01 | 0.01 | 0.01 | 0.00 | 0.00 | 403.21 | 363.61 | 171.60 | 0.42 | 39.72 |
| | | | 14 | 2 | LARCV | 2 | | 2 | 350.0 | 10.85 | 2.338 | 0.879935 | 0.7175 | 0.77 | 1215.20 | 261.86 | 98.55 | 80.36 | 86.24 |
| 49 | Maritime Pre-positioning Ships (MPS) Offload | | 5 | 2 | HMMWVs | 2 | 65% | 3 | | 0.18 | 2.06 | 0.60 | 0.19 | 0.17 | 7.21 | 80.48 | 23.47 | 7.46 | 6.71 |
| | | | 5 | 2 | 5-ton truck | 1 | 80% | 1 | | 0.25 | 0.30 | 0.02 | 0.00 | 0.01 | 1.96 | 2.38 | 0.17 | 0.00 | 0.11 |
| | | | 5 | 2 | Dozer | 1 | 59% | 8 | 240.0 | 0.01 | 0.02 | 0.00 | 0.00 | 0.00 | 65.18 | 207.04 | 23.23 | 0.15 | 12.29 |
| | | | 5 | 2 | 4WD Pickups | 3 | | 2 | | 0.20 | 0.02 | 0.01 | 0.00 | 0.00 | 12.12 | 1.01 | 0.73 | 0.01 | 0.06 |
| | | | 5 | 2 | LARCV | 1 | | 2 | 350.0 | 10.85 | 2.338 | 0.879935 | 0.7175 | 0.77 | 217.00 | 46.76 | 17.60 | 14.35 | 15.40 |
| 50 | Reverse Osmosis Water Purification Unit | | 4 | 4 | 4WD Pickups | 2 | | 2 | | 0.20 | 0.02 | 0.01 | 0.00 | 0.00 | 12.93 | 1.08 | 0.77 | 0.01 | 0.07 |
| | | | 4 | 4 | RTVs | 6 | 48% | 8 | 93.0 | 0.01 | 0.02 | 0.00 | 0.00 | 0.00 | 309.65 | 564.70 | 95.74 | 0.52 | 51.61 |
| | | | 4 | 4 | Generator | 1 | 74% | 8 | 22.0 | 0.01 | 0.01 | 0.00 | 0.00 | 0.00 | 12.41 | 18.84 | 6.66 | 4.17 | 2.76 |
| | | | 4 | 4 | Flatbed Truck | 1 | 80% | 1 | | 0.25 | 0.30 | 0.02 | 0.00 | 0.01 | 3.14 | 3.81 | 0.27 | 0.01 | 0.18 |
| 51 | Roll-on/Roll-off Discharge Facility | | 5 | 2 | HMMWVs/Jeeps | 3 | 65% | 3 | | 0.18 | 2.06 | 0.60 | 0.19 | 0.17 | 10.81 | 120.72 | 35.21 | 11.19 | 10.06 |
| | | | 5 | 2 | 6-ton truck | 1 | 80% | 1 | | 0.25 | 0.30 | 0.02 | 0.00 | 0.01 | 1.96 | 2.38 | 0.17 | 0.00 | 0.11 |
| | | | 5 | 2 | Dozer | 1 | 59% | 8 | 240.0 | 0.01 | 0.02 | 0.00 | 0.00 | 0.00 | 65.18 | 207.04 | 23.23 | 0.15 | 12.29 |
| | | | 5 | 2 | Cranes | 2 | 43% | 8 | 194.0 | 0.00 | 0.02 | 0.00 | 0.00 | 0.00 | 57.67 | 206.86 | 20.60 | 0.18 | 7.94 |
| | | | 5 | 2 | RTVs | 2 | 48% | 8 | 93.0 | 0.01 | 0.02 | 0.00 | 0.00 | 0.00 | 64.51 | 117.65 | 19.95 | 0.11 | 10.75 |
| | | | 5 | 2 | LARCV | 2 | | 2 | 350.0 | 10.85 | 2.338 | 0.879935 | 0.7175 | 0.77 | 434.00 | 93.52 | 35.20 | 28.70 | 30.80 |
| 52 | MPF Utility Boat Operator Course | | 9 | 2 | Dozer | 1 | 59% | 8 | 240.0 | 0.01 | 0.02 | 0.00 | 0.00 | 0.00 | 117.33 | 372.66 | 41.81 | 0.27 | 22.12 |
| | | | 9 | 2 | Van | 1 | | 2 | | 0.20 | 0.02 | 0.01 | 0.00 | 0.00 | 7.27 | 0.61 | 0.44 | 0.01 | 0.04 |
| | | | 9 | 2 | LARCV | 2 | | 2 | 350.0 | 10.85 | 2.338 | 0.879935 | 0.7175 | 0.77 | 781.20 | 168.34 | 63.36 | 51.66 | 55.44 |
| 53 | LARC V Operator Training | | 6 | 1 | LARCV | 2 | | 2 | 350.0 | 10.85 | 2.338 | 0.879935 | 0.7175 | 0.77 | 260.40 | 56.11 | 21.12 | 17.22 | 18.48 |
| **4.9.1** | **Conduct Mission Area Training** | | | | | | | | | | | | | | | | | | |
| | **NSW Diving and Beach Operations** | | | | | | | | | | | | | | | | | | |
| 54 | Lung Automatic Rebreather (LAR) V Closed Circuit Breathing Diving | | 1 | 126 | 4WD Pickups | 3 | | 2 | | 0.20 | 0.02 | 0.01 | 0.00 | 0.00 | 152.71 | 12.78 | 9.15 | 0.17 | 0.77 |
| | | | 1 | 126 | Bus | 2 | | 2 | | 0.21 | 0.74 | 0.04 | 0.00 | 0.02 | 103.32 | 373.26 | 20.71 | 0.43 | 8.42 |
| 55 | Open Circuit Breathing Diving | | 1 | 12 | 4WD Pickups | 3 | | 2 | | 0.20 | 0.02 | 0.01 | 0.00 | 0.00 | 14.54 | 1.22 | 0.87 | 0.02 | 0.07 |
| | | | 1 | 12 | Bus | 2 | | 2 | | 0.21 | 0.74 | 0.04 | 0.00 | 0.02 | 9.84 | 35.55 | 1.97 | 0.04 | 0.80 |
| 56 | OTB Field Training Exercise | | 5 | 36 | 4WD Pickups | 3 | | 2 | | 0.20 | 0.02 | 0.01 | 0.00 | 0.00 | 218.16 | 18.25 | 13.07 | 0.25 | 1.11 |
| 57 | Rock Portage | | 1 | 20 | 4WD Pickups | 1 | | 2 | | 0.20 | 0.02 | 0.01 | 0.00 | 0.00 | 8.08 | 0.68 | 0.48 | 0.01 | 0.04 |
| | **NSW Land Warfare** | | | | | | | | | | | | | | | | | | |
| 58 | Land Patrolling | | 1 | 18 | 4WD Pickups | 2 | | 2 | | 0.20 | 0.02 | 0.01 | 0.00 | 0.00 | 14.54 | 1.22 | 0.87 | 0.02 | 0.07 |
| 59 | Immediate Action Drills | | 1 | 6 | 4WD Pickups | 2 | | 2 | | 0.20 | 0.02 | 0.01 | 0.00 | 0.00 | 4.85 | 0.41 | 0.29 | 0.01 | 0.02 |
| | **NSW Advanced Training** | | | | | | | | | | | | | | | | | | |
| 60 | Over the Beach Insertion / Photo Reconnaissance | | 1 | 31 | 4WD Pickup | 2 | | 2 | | 0.20 | 0.02 | 0.01 | 0.00 | 0.00 | 25.05 | 2.10 | 1.50 | 0.03 | 0.13 |
| 61 | Photo Image Capture | | 14 | 4 | 4WD Pickups | 2 | | 2 | | 0.20 | 0.02 | 0.01 | 0.00 | 0.00 | 45.25 | 3.79 | 2.71 | 0.05 | 0.23 |
| 62 | Field Skills (Observation Drill, Sketching, Range Estimation) | | 1 | 24 | 4WD Pickups | 2 | | 2 | | 0.20 | 0.02 | 0.01 | 0.00 | 0.00 | 19.39 | 1.62 | 1.16 | 0.02 | 0.10 |
| 63 | Stalking, Movement and Hide-Sites | | 5 | 8 | 4WD Pickups | 3 | | 2 | | 0.20 | 0.02 | 0.01 | 0.00 | 0.00 | 48.48 | 4.06 | 2.90 | 0.06 | 0.25 |
| 64 | CQC/CQD | | 1 | 198 | 4WD Pickups | 5 | | 2 | | 0.20 | 0.02 | 0.01 | 0.00 | 0.00 | 399.96 | 33.46 | 23.96 | 0.46 | 2.03 |
| 65 | Communications | | 5 | 6 | 4WD Pickups | 6 | | 2 | | 0.20 | 0.02 | 0.01 | 0.00 | 0.00 | 72.72 | 6.08 | 4.36 | 0.08 | 0.37 |
| 66 | Unmanned Aerial Vehicle (UAV) Training | | 5 | 12 | 4WD Pickups | 1 | | 2 | | 0.20 | 0.02 | 0.01 | 0.00 | 0.00 | 24.24 | 2.03 | 1.45 | 0.03 | 0.12 |
| 67 | Around the World Training | | 1 | 6 | 4WD Pickups | 4 | | 2 | | 0.20 | 0.02 | 0.01 | 0.00 | 0.00 | 9.70 | 0.81 | 0.58 | 0.01 | 0.05 |
| **4.9.4** | **Provide/Execute Training for U.S. and Other Nation Units and Individuals** | | | | | | | | | | | | | | | | | | |
| | **NSW Physical Fitness Training** | | | | | | | | | | | | | | | | | | |
| 68 | Physical Training Runs | | 1 | 464 | 4WD Pickups | 3 | | 2 | | 0.20 | 0.02 | 0.01 | 0.00 | 0.00 | 562.37 | 47.05 | 33.69 | 0.64 | 2.85 |
| 69 | Physical Conditioning Training Exercise | | 1 | 280 | 4WD Pickups | 2 | | 2 | | 0.20 | 0.02 | 0.01 | 0.00 | 0.00 | 226.24 | 18.93 | 13.55 | 0.26 | 1.15 |
| 70 | Swim Training | | 1 | 172 | 4WD Pickups | 1 | | 2 | | 0.20 | 0.02 | 0.01 | 0.00 | 0.00 | 69.49 | 5.81 | 4.16 | 0.08 | 0.35 |
| 71 | Hell Week | | 5 | 6 | 4WD Pickups | 3 | | 2 | | 0.20 | 0.02 | 0.01 | 0.00 | 0.00 | 36.36 | 3.04 | 2.18 | 0.04 | 0.18 |

| Scenario | Type Training | Reference | Days (a) | Operations (b) | Ground Vehicles | Number | Engine Load | Hours per day | Horsepower | Emissions Factors (lb/hr) CO | NOx | ROG | SOx | PM10 | Emissions (lbs) CO | Nox | ROG | Sox | PM |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 72 | Rucksack March | | 1 | 54 | 4WD Pickups | 3 | | 2 | | 0.20 | 0.02 | 0.01 | 0.00 | 0.00 | 65.45 | 5.48 | 3.92 | 0.07 | 0.33 |
| 73 | Monster Mash | | 1 | 6 | 4WD Pickups | 3 | | 2 | | 0.20 | 0.02 | 0.01 | 0.00 | 0.00 | 7.27 | 0.61 | 0.44 | 0.01 | 0.04 |
| **4.12.6** | **Provide Industrial and Environmental Health Services** | | | | | | | | | | | | | | | | | | |
| 74 | Conduct Environmental Health Site Assessment | | 3 | 3 | 4WD Pickups | 4 | | 2 | | 0.20 | 0.02 | 0.01 | 0.00 | 0.00 | 14.54 | 1.22 | 0.87 | 0.02 | 0.07 |
| | | | 3 | 3 | 5-ton truck | 1 | | 2 | | 0.25 | 0.30 | 0.02 | 0.00 | 0.01 | 4.41 | 5.36 | 0.38 | 0.01 | 0.26 |
| | | | 3 | 3 | 3/4-ton trailer | 1 | | 2 | | 0.25 | 0.30 | 0.02 | 0.00 | 0.01 | 4.41 | 5.36 | 0.38 | 0.01 | 0.26 |
| | | | 3 | 3 | small trailers | 3 | | 2 | | 0.20 | 0.02 | 0.01 | 0.00 | 0.00 | 10.91 | 0.91 | 0.65 | 0.01 | 0.06 |
| **6.1.1** | **Conduct Explosive Ordnance Disposal** | | | | | | | | | | | | | | | | | | |
| 75 | Conventional Ordnance/Improvised Explosive Device Response | | 1 | 120 | 4WD Pickups | 2 | | 2 | | 0.20 | 0.02 | 0.01 | 0.00 | 0.00 | 96.96 | 8.11 | 5.81 | 0.11 | 0.49 |
| 76 | Land Mine Detection/Neutralization | | 1 | 45 | 4WD Pickups / Vans | 2 | | 2 | | 0.20 | 0.02 | 0.01 | 0.00 | 0.00 | 36.36 | 3.04 | 2.18 | 0.04 | 0.18 |
| **6.3.1** | **Force Protection: Protect and Secure Area of Operations** | | | | | | | | | | | | | | | | | | |
| 77 | Field Training Exercise (FTX) e.g. SEAHAWK | | 14 | 53 | 4WD Pickups | 140 | | 2 | | 0.20 | 0.02 | 0.01 | 0.00 | 0.00 | 28.28 | 2.37 | 1.69 | 0.03 | 0.14 |
| | | | 14 | 53 | Generators | 176 | 74% | 2 | 22.0 | 0.01 | 0.01 | 0.00 | 0.00 | 0.00 | 1.05 | 1.59 | 0.56 | 0.35 | 0.23 |
| | | | 14 | 53 | Forklift | 8 | 48% | 8 | 37.0 | 0.01 | 0.01 | 0.00 | 0.00 | 0.00 | 0.05 | 0.07 | 0.03 | 0.02 | 0.01 |
| **6.3.3** | **Combat Terrorism** | | | | | | | | | | | | | | | | | | |
| 78 | Small Boat Attack | | 1 | 36 | None | | | | | | | | | | | | | | |

| | CO | Nox | ROG | Sox | PM |
|---|---|---|---|---|---|
| **lbs/year** | **54230.04** | **89062.56** | **12407.03** | **5275.14** | **7541.34** |
| **tons/year** | **27.12** | **44.53** | **6.20** | **2.64** | **3.77** |

Assumptions: Fuel truck is equivalent to 4WD vehicle; large trucks modeled as MDTs. Busses assumed to be diesel powered
Emission factors from ARB's OFFROAD 2007 Model
Generator Emissions from Table C-12
(a) Days = the number of days per operation
(b) Operations = the number of operations per year
Heater is assumed to be "other industrial equipment" from URBEMIS Model.

| Scenario | Type Training | Reference | Days (a) | Operations (b) | Ordnance | Number | Type | Compound | Number or Amount | Weight of Compound, grams | CO | NOX | ROG | SOX | PM10 | Emissions, lbs/year | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | lbs/item | lbs/item | lbs/item | lbs/item | lbs/item | Total CO | Total NOx | Total ROG | Total SOx | Total PM10 |
| | **Conduct Maneuver - Move Forces** | | | | | | | | | | | | | | | | | | | |
| 1 | Anchoring | | 1 | 72 | None | | | | | | | | | | | | | | | |
| 2 | Towing | | 1 | 30 | None | | | | | | | | | | | | | | | |
| 3 | Moor to Buoy | | 1 | 36 | None | | | | | | | | | | | | | | | |
| **1.3.1** | **Perform Mine Countermeasures** | | | | | | | | | | | | | | | | | | | |
| 4 | Parachute Operations | | 1 | 228 | Smoke Grenades/Flares | 3 | Smoke Gre | *M18 Green* | 684 | | 1.20E-02 | 1.70E-05 | 2.10E-03 | 1.60E-04 | 1.30E-01 | 8.21E+00 | 1.16E-02 | 1.44E+00 | 1.09E-01 | 8.89E+01 |
| | | | | | | | Green Para | M195 | 684 | | 9.40E-03 | 2.40E-03 | | 7.80E-05 | 1.20E-01 | 6.43E+00 | 1.64E+00 | 0.00E+00 | 5.34E-02 | 8.21E+01 |
| 5 | MCM Operations | | 1 | 58 | Blast Caps/ Diver Recalls | 1 | Underwater | | | | | | | | | | | | | |
| 6 | Floating Mine Operations | | 1 | 53 | Blast Caps/ Diver Recalls | 1 | | | 53 | | 0.026 | 0.008 | | 0.000 | 0.003 | 1.38E+00 | 4.19E-01 | 0.00E+00 | 7.95E-03 | 1.38E-01 |
| 7 | Dive Platoon | | 1 | 8 | Blast Caps/Explosives | 9 per training | Underwater | | | | | | | | | | | | | |
| | | | 1 | 8 | 3.5 lb | 8 sequential command detonated | Underwater | | | | | | | | | | | | | |
| 8 | Very Shallow Water (VSW) Operator Course | | 8 | 6 | Diver Recalls | 2 per training | Underwater | | | | | | | | | | | | | |
| 9 | VSW Mine Countermeasure Operations | | 1 | 156 | Diver Recalls | 2 per training | Underwater | | | | | | | | | | | | | |
| 10 | Autonomous Underwater Vehicle (AUV) Operations/UUV Operatior | | 1 | 156 | Blast Caps/ Diver Recalls | 2 per training | Underwater | | | | | | | | | | | | | |
| 11 | MK8 Marine Mammal/MMS Operations | | 1 | 208 | 13lbs [MK 87/88 C-4 in GRP | Approximately 10% of training inv | Underwater | | | | | | | | | | | | | |
| | | | | | 29lb [MK86/89 PBXN in AL canist | Approximately 10% of training inv | Underwater | | | | | | | | | | | | | |
| 12 | Mine Neutralization | | 1 | 4 | Blast Caps/ Diver Recalls | 9 per training | Underwater | | 8 | | 0.026 | 0.008 | | 0.000 | 0.003 | 2.08E-01 | 6.32E-02 | 0.00E+00 | 1.20E-03 | 2.08E-02 |
| | | | 1 | 4 | 3.5lb explosive | 8 sequential command detonated | Underwater | | | | | | | | | | | | | |
| N1 | Shock Wave Generator | | 1 | 90 | Underwater Explosives (15 grams | 1 command detonation | Underwater | | | | | | | | | | | | | |
| | | | | | Diver Recalls | 1 per training | Underwater | | | | | | | | | | | | | |
| N2 | Surf Zone Test Detachment/Equipment T&E | | 1 | 200 | None | | | | | | | | | | | | | | | |
| N3 | UUV Neutralization | | 1 | 4 | Explosives | 2 sequential charges of either 3.3 | Underwater | | | | | | | | | | | | | |
| | | | 1 | 4 | Seafox (3.3 lb PBXN9) | 2 sequential charges of either 3.3 | Underwater | | | | | | | | | | | | | |
| | | | 1 | 4 | Archerfish (3.57 lb PBXN10) | | Underwater | | | | | | | | | | | | | |
| N4 | Mine Hunting | | 1 | 200 | None | | | | | | | | | | | | | | | |
| N5 | Airborne Laser Mine Detection | | 1 | 48 | None | | | | | | | | | | | | | | | |
| N6 | Organic Airborne Surface Influence Sweep | | 1 | 100 | None | | | | | | | | | | | | | | | |
| N7 | Airborne Mine Neutralization | | 1 | 48 | 1.6 kg net explosive (PBXN110) | 1 per training | Underwater | | | | | | | | | | | | | |
| **1.4.6** | **Conduct Maritime Interception** | | | | | | | | | | | | | | | | | | | |
| 13 | Visit, Board, Search and Seizure | | 1 | 42 | None | | | | | | | | | | | | | | | |
| **1.5.4** | **Conduct Amphibious Operations** | | | | | | | | | | | | | | | | | | | |
| 14 | Small Boat Handling | | 1 | 94 | None | | | | | | | | | | | | | | | |
| 15 | Swimmer Conditioning - Bay and Ocean with fins | | 1 | 189 | None | | | | | | | | | | | | | | | |
| 16 | Basic Reconnaissance Course Final Mission | | 1 | 8 | None | | | | | | | | | | | | | | | |
| 17 | Obstacle Course | | 1 | 142 | None | | | | | | | | | | | | | | | |
| 18 | Hydrographic Reconnaissance | | 1 | 44 | None | | | | | | | | | | | | | | | |
| 19 | Surf Observations (SUROBS) | | 1 | 116 | None | | | | | | | | | | | | | | | |
| 20 | CRRC Inflatable Boat Small (IBS)/Surf Passage/Boat Team Organi | | 1 | 72 | None | | | | | | | | | | | | | | | |
| 21 | CRRC Towing and High Speed Maneuver | | 1 | 8 | None | | | | | | | | | | | | | | | |
| 22 | CRRC Bay Landing Craft Utility (LCU) Launch and Recover - Bay a | | 1 | 24 | None | | | | | | | | | | | | | | | |
| 23 | CRRC Navigation, Bay and Ocean Runs | | 1 | 26 | None | | | | | | | | | | | | | | | |
| 24 | Amphibious Raid Course Final Mission | | 1 | 24 | None | | | | | | | | | | | | | | | |
| 25 | Amphibious Raid Operations | | 3 | 18 | Flares | 3 | Green Para | *M195* | 54 | | 9.40E-03 | 2.40E-03 | | 7.80E-05 | 1.20E-01 | 5.08E-01 | 1.30E-01 | 0.00E+00 | 4.21E-03 | 6.48E+00 |
| | | | | | Grenades | 20 | Grenades | *M116A1* | 360 | | 3.70E-04 | 5.60E-03 | 4.20E-05 | 4.70E-04 | 1.20E-01 | 1.33E-01 | 2.02E+00 | 1.51E-02 | 1.69E-01 | 4.32E+01 |
| | | | | | 9MM | 1490 | 9 MM | | 1490 | | 3.10E-04 | 1.50E-05 | | 8.20E-08 | 2.40E-05 | 4.62E-01 | 2.24E-02 | 0.00E+00 | 1.22E-04 | 3.58E-02 |
| | | | | | 5.56MM/38CAL | 520/100 | 5.56 Blank | | 520 | | 2.80E-04 | 2.00E-05 | | 9.80E-03 | 6.90E-06 | 1.46E-01 | 1.04E-02 | 0.00E+00 | 5.10E+00 | 3.59E-03 |
| | | | | | | | 38 cal Blank | | 100 | | 1.00E-04 | 6.80E-05 | | 6.30E-07 | 1.80E-05 | 1.00E-02 | 6.80E-03 | | 6.30E-05 | |
| | | | | | Diver Recalls | 3 | Underwater | | | | | | | | | | | | | |
| 26 | Direct Action (DA) Operations | | 3 | 18 | Explosives | 10 | | | 180 | | 0.026 | 0.008 | | 0.000 | 0.003 | 4.68E+00 | 1.42E+00 | 0.00E+00 | 2.70E-02 | 4.68E-01 |
| | | | | | Smoke | 3 | Smoke | | 54 | | 1.20E-02 | 1.70E-05 | 2.10E-03 | 1.60E-04 | 1.30E-01 | 6.48E-01 | 9.18E-04 | 1.13E-01 | 8.64E-03 | 7.02E+00 |
| | | | | | 9MM | 1240 per year | 9 MM | | 1240 | | 3.10E-04 | 1.50E-05 | | 8.20E-08 | 2.40E-05 | 3.84E-01 | 1.86E-02 | 0.00E+00 | 1.02E-04 | 2.98E-02 |
| | | | | | 5.56MM/38CAL | 430/90 per year | 5.56 Blank | | 430 | | 2.80E-04 | 2.00E-05 | | 9.80E-03 | 6.90E-06 | 1.20E-01 | 8.60E-03 | 0.00E+00 | 4.21E+00 | 2.97E-03 |
| | | | | | | | 38 cal | | 90 | | 1.00E-04 | 6.80E-05 | | 6.30E-07 | 1.80E-05 | 9.00E-03 | 6.12E-03 | 0.00E+00 | 5.67E-05 | 1.62E-03 |
| | | | | | Diver Recalls | 3 | Underwater | | | | | | | | | | | | | |
| 27 | Craft Landing Zone (CLZ) | | 1 | 4 | Smoke | 3 | Smoke | | 12 | | 1.20E-02 | 1.70E-05 | 2.10E-03 | 1.60E-04 | 1.30E-01 | 1.44E-01 | 2.04E-04 | 2.52E-02 | 1.92E-03 | 1.56E+00 |
| N8 | Tactical Recovery of Aircraft and Personnel | | 1 | 4 | Small Arms | 5000 rnds 50 cal/7.62 blanks | 50 cal blank | | 1250 | | 1.80E-03 | 2.80E-05 | | | 9.80E-05 | 2.25E+00 | 3.50E-02 | 0.00E+00 | 0.00E+00 | 1.23E-01 |
| | | | | | | | 7.62 blank | | 3750 | | 6.80E-04 | 4.40E-05 | | 3.50E-07 | 1.70E-05 | 2.55E+00 | 1.65E-01 | 0.00E+00 | 1.31E-03 | 6.38E-02 |

Table C-14
Ordnance Emissions
Alternatives 1 and 2

| | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | lbs/item | lbs/item | lbs/item | lbs/item | lbs/item | **Total CO** | **Total NOx** | **Total ROG** | **Total SOx** | **Total PM10** |
| **1.5.7** | **Conduct Naval Special Warfare** | | | | | | | | | | | | | | | | | | |
| 28 | Swimmer/Combat Rubber Raiding Craft Over-the-Beach | 4 | 86 | Smokes/Flares/Surface Explosive | 3 flares, 10 grenades | Grenades | *M116A1* | 860 | | 3.70E-04 | 5.60E-03 | 4.20E-05 | 4.70E-04 | 1.20E-01 | 3.18E-01 | 4.82E+00 | 3.61E-02 | 4.04E-01 | 1.03E+02 |
| | | | | | | Green Para | *M195* | 258 | | 9.40E-03 | 2.40E-03 | | 7.80E-05 | 1.20E-01 | 2.43E+00 | 6.19E-01 | 0.00E+00 | 2.01E-02 | 3.10E+01 |
| | | | | Small Arms | 6600/5000 .5 cal/7.62 mm | 0.5 cal | | 6600 | | 1.80E-03 | 2.80E-05 | | | 9.80E-05 | 1.19E+01 | 1.85E-01 | 0.00E+00 | 0.00E+00 | 6.47E-01 |
| | | | | | | 7.62 mm | | 5000 | | 6.80E-04 | 4.40E-05 | | 3.50E-07 | 1.70E-05 | 3.40E+00 | 2.20E-01 | 0.00E+00 | 1.75E-03 | 8.50E-02 |
| 29 | Over-the-Beach Stalk | 1 | 24 | None | | | | | | | | | | | | | | | |
| 30 | Immediate Action Drills | 1 | 12 | Smokes/Flares/Surface | 10 | Grenades | *M116A1* | 120 | | 3.70E-04 | 5.60E-03 | 4.20E-05 | 4.70E-04 | 1.20E-01 | 4.44E-02 | 6.72E-01 | 5.04E-03 | 5.64E-02 | 1.44E+01 |
| | | | | | 3 | Green Para | M195 | 36 | | 9.40E-03 | 2.40E-03 | | 7.80E-05 | 1.20E-01 | 3.38E-01 | 8.64E-02 | 0.00E+00 | 2.81E-03 | 4.32E+00 |
| | | | 6 | Small Arms | 5000 | 0.50 cal/7.62 blank | | 30000 | | 1.80E-03 | 2.80E-05 | | | 9.80E-05 | 5.40E+01 | 8.40E-01 | 0.00E+00 | 0.00E+00 | 2.94E+00 |
| 31 | Breacher Training | 1 | 6 | Small Arms | 1400 | 12 gauge | | 1400 | | 1.50E-03 | 4.20E-05 | | | 7.40E-05 | 2.10E+00 | 5.88E-02 | 0.00E+00 | 0.00E+00 | 1.04E-01 |
| 32 | Amphibious Warfare Exercise | 1 | 84 | Smoke Grenades/Flares | 3 | | | | | | | | | | | | | | |
| 33 | Mobility Primary Mission Area | 1 | 200 | Smoke/Flares | 3 | Smoke | | 600 | | 1.20E-02 | 1.70E-05 | 2.10E-03 | 1.60E-04 | 1.30E-01 | 7.20E+00 | 1.02E-02 | 1.26E+00 | 9.60E-02 | 7.80E+01 |
| 34 | Escape and Evasion | 1 | 84 | Smoke/Flares | 3 | Smoke | | 252 | | 1.20E-02 | 1.70E-05 | 2.10E-03 | 1.60E-04 | 1.30E-01 | 3.02E+00 | 4.28E-03 | 5.29E-01 | 4.03E-02 | 3.28E+01 |
| N9 | Underwater Demolition Qualification / Certification | 1 | 12 | 12.5-13.75 pound (underwater) | two sequential 12.5-13.75 pound ( | Underwater | | | | | | | | | | | | | |
| | | 1 | 12 | 25.5-pound (underwater) | two sequential 12.5-13.75 pound charges or a single 25.5-pound charge | | | | | | | | | | | | | | |
| N10 | Vehicle Patrolling and Testing | 1 | 50 | None | 0 | | | | | | | | | | | | | | |
| N11 | NSW Demolition Traning: Demolition Requalifications and Training | 1 | 12 | Blast Caps/Diver Recall | | Underwater | | | | | | | | | | | | | |
| | | | | 5 -10 pounds of C-4 | 1 | Underwater | | | | | | | | | | | | | |
| **2.2.3** | **Perform Tactical Reconnaissance and Surveillance** | | | | | | | | | | | | | | | | | | |
| 35 | Helicopter Rope Suspension Training/Cast & Recovery Operation | 1 | 154 | Smoke Grenades/Flares | 3 | Smoke | | 462 | | 1.20E-02 | 1.70E-05 | 2.10E-03 | 1.60E-04 | 1.30E-01 | 5.54E+00 | 7.85E-03 | 9.70E-01 | 7.39E-02 | 6.01E+01 |
| 36 | Rappel and Fast Rope Training | 1 | 11 | None | 0 | | | | | | | | | | | | | | |
| 37 | SEAL Delivery Vehicle (SDV)/Advanced Seal Delivery System (ASI | 14 | 40 | ≤ 10 lbs C-4 (underwater) | 1 | Underwater | | | | | | | | | | | | | |
| **4.5.6** | **Construct, Maintain, and Operate Logistics Over-the-Shore** | | | | | | | | | | | | | | | | | | |
| 38 | OPDS | 25 | 6 | None | 0 | | | | | | | | | | | | | | |
| 39 | Amphibious Bulk Liquid Transfer System (ABLTS) | 10 | 5 | None | 0 | | | | | | | | | | | | | | |
| 40 | Barge Ferry/Causeway Coxswain Training | 3 | 54 | None | 0 | | | | | | | | | | | | | | |
| 41 | Causeway Pier Insertion and Retraction | 5 | 10 | None | 0 | | | | | | | | | | | | | | |
| 42 | Elevated Causeway System (ELCAS) | 10 | 4 | None | 0 | | | | | | | | | | | | | | |
| 43 | Establish Beach Party Command Post | 4 | 16 | 5.56 caliber rounds | 30 | 5.56 Blank | | 30 | | 2.80E-04 | 2.00E-05 | | 9.80E-03 | 6.90E-06 | 8.40E-03 | 6.00E-04 | 0.00E+00 | 2.94E-01 | 2.07E-04 |
| | | | | 7.62 caliber blanks | 100 | 7.62 caliber blanks | | 100 | (b) | 6.80E-04 | 4.40E-05 | | 3.50E-07 | 1.70E-05 | 6.80E-02 | 4.40E-03 | 0.00E+00 | 3.50E-05 | 1.70E-03 |
| 44 | Sterngate Marriage to Amphibious Ship/LCU | 1 | 40 | None | 0 | | | | | | | | | | | | | | |
| 45 | LCU/LCM Beaching | 1 | 60 | None | 0 | | | | | | | | | | | | | | |
| 46 | LCU/LCM Towing/Being Towed | 1 | 60 | None | 0 | | | | | | | | | | | | | | |
| 47 | Communications Training | 2 | 2 | 0 | | | | | | | | | | | | | | | |
| 48 | Field Training Exercise with a Beach Camp | 14 | 2 | 5.56 caliber rounds | 30 | 5.56 Blank | | 30 | (c) | 2.80E-04 | 2.00E-05 | | 9.80E-03 | 6.90E-06 | 8.40E-03 | 6.00E-04 | 0.00E+00 | 2.94E-01 | 2.07E-04 |
| | | | | 7.62 caliber blanks | 100 | 7.62 caliber blanks | | 100 | (c) | 6.80E-04 | 4.40E-05 | | 3.50E-07 | 1.70E-05 | 6.80E-02 | 4.40E-03 | 0.00E+00 | 3.50E-05 | 1.70E-03 |
| 49 | Maritime Pre-positioning Ships (MPS) Offload | 5 | 2 | None | 0 | | | | | | | | | | | | | | |
| 50 | Reverse Osmosis Water Purification Unit | 4 | 4 | None | 0 | | | | | | | | | | | | | | |
| 51 | Roll-on/Roll-off Discharge Facility | 5 | 2 | None | 0 | | | | | | | | | | | | | | |
| 52 | MPF Utility Boat Operator Course | 9 | 2 | None | 0 | | | | | | | | | | | | | | |
| 53 | LARC V Operator Training | 6 | 1 | None | 0 | | | | | | | | | | | | | | |
| **4.9.1** | **Conduct Mission Area Training** | | | | | | | | | | | | | | | | | | |
| | **NSW Diving and Beach Operations** | | | | | | | | | | | | | | | | | | |
| 54 | Lung Automatic Rebreather (LAR) V Closed Circuit Breathing Divir | 1 | 126 | Diver Recall | 1 | Underwater | | | | | | | | | | | | | |
| 55 | Open Circuit Breathing Diving | 1 | 12 | Diver Recall | 1 | Underwater | | | | | | | | | | | | | |
| 56 | OTB Field Training Exercise | 5 | 36 | Small arm | 15000 7.62mm; 19800 .5cal ANN( | 7.62 mm | | 15000 | | 6.80E-04 | 4.40E-05 | | 3.50E-07 | 1.70E-05 | 1.02E+01 | 6.60E-01 | 0.00E+00 | 5.25E-03 | 2.55E-01 |
| | | | | | | 0.5 cal | | 19800 | | 1.80E-03 | 2.80E-05 | | | 9.80E-05 | 3.56E+01 | 5.54E-01 | 0.00E+00 | 0.00E+00 | 1.94E+00 |
| 57 | Rock Portage | 1 | 20 | Smoke Grenades/Flares | 3 | Smoke | | 60 | | 1.20E-02 | 1.70E-05 | 2.10E-03 | 1.60E-04 | 1.30E-01 | 7.20E-01 | 1.02E-03 | 1.26E-01 | 9.60E-03 | 7.80E+00 |
| | | | | | | Grenades | *M116A1* | 60 | | 3.70E-04 | 5.60E-03 | 4.20E-05 | 4.70E-04 | 1.20E-01 | 2.22E-02 | 3.36E-01 | 2.52E-03 | 2.82E-02 | 7.20E+00 |
| | **NSW Land Warfare** | | | | | | | | | | | | | | | | | | |
| 58 | Land Patrolling | 1 | 18 | None | 0 | | | | | | | | | | | | | | |
| 59 | Immediate Action Drills | 1 | 6 | .5CAL/7.62 BLANK | 5000 RNDS each per operation (3 | 0.5 cal | | 30000 | | 1.80E-03 | 2.80E-05 | | | 9.80E-05 | 5.40E+01 | 8.40E-01 | 0.00E+00 | 0.00E+00 | 2.94E+00 |
| | | | | | | 7.62 caliber blanks | | 30000 | | 6.80E-04 | 4.40E-05 | | 3.50E-07 | 1.70E-05 | 2.04E+01 | 1.32E+00 | 0.00E+00 | 1.05E-02 | 5.10E-01 |
| | **NSW Advanced Training** | | | | | | | | | | | | | | | | | | |
| 60 | Over the Beach Insertion / Photo Reconnaissance | 1 | 31 | Small arms/blanks | 10 9 mm blanks; 10 5.56 blanks p | 9 mm blank | | 310 | | 3.10E-04 | 1.50E-05 | | | 2.40E-05 | 9.61E-02 | 4.65E-03 | 0.00E+00 | 0.00E+00 | 7.44E-03 |
| | | | | | | 5.56 mm blank | | 310 | | 2.80E-04 | 2.00E-05 | | 9.80E-03 | 6.90E-06 | 8.68E-02 | 6.20E-03 | 0.00E+00 | 3.04E+00 | 2.14E-03 |
| 61 | Photo Image Capture | 14 | 4 | Small arms/blanks | 10 9 mm blanks; 10 5.56 blanks p | 9 mm blank | | 40 | | 3.10E-04 | 1.50E-05 | | | 2.40E-05 | 1.24E-02 | 6.00E-04 | 0.00E+00 | 0.00E+00 | 9.60E-04 |
| | | | | | | 5.56 mm blank | | 40 | | 2.80E-04 | 2.00E-05 | | 9.80E-03 | 6.90E-06 | 1.12E-02 | 8.00E-04 | 0.00E+00 | 3.92E-01 | 2.76E-04 |
| 62 | Field Skills (Observation Drill, Sketching, Range Estimation) | 1 | 24 | Small arms/blanks | 10 9 mm blanks; 10 5.56 blanks p | 9 mm blank | | 240 | | 3.10E-04 | 1.50E-05 | | | 2.40E-05 | 7.44E-02 | 3.60E-03 | 0.00E+00 | 0.00E+00 | 5.76E-03 |
| | | | | | | 5.56 mm blank | | 240 | | 2.80E-04 | 2.00E-05 | | 9.80E-03 | 6.90E-06 | 6.72E-02 | 4.80E-03 | 0.00E+00 | 2.35E+00 | 1.66E-03 |
| 63 | Stalking, Movement and Hide-Sites | 5 | 8 | None | 0 | | | | | | | | | | | | | | |
| 64 | CQC/CQD | 1 | 198 | Small Arms | 104600 9 MM simunition; 36300 5.56 simunition; | | | | | | | | | | | | | | |
| | | | | Small Arms | 7200 | 9 MM | | 7200 | | 3.10E-04 | 1.50E-05 | | | 2.40E-05 | 2.23E+00 | 1.08E-01 | 0.00E+00 | 0.00E+00 | 1.73E-01 |
| | | | | Small Arms | 10000 | 5.56 Blank | | 10000 | | 2.80E-04 | 2.00E-05 | | 9.80E-03 | 6.90E-06 | 2.80E+00 | 2.00E-01 | 0.00E+00 | 9.80E+01 | 6.90E-02 |

Table C-14
Ordnance Emissions
Alternatives 1 and 2

| | | | | | | | | | lbs/item | lbs/item | lbs/item | lbs/item | lbs/item | Total CO | Total NOx | Total ROG | Total SOx | Total PM10 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Small Arms | 7300 .38 cal | .38 cal | | 7300 | 1.00E-04 | 6.80E-05 | | 6.30E-07 | 1.80E-05 | 7.30E-01 | 4.96E-01 | 0.00E+00 | 4.60E-03 | 1.31E-01 |
| | | | | Grenades (flash crash) | 3 | Grenades | *M116A1* | 594 | 3.70E-04 | 5.60E-03 | 4.20E-05 | 4.70E-04 | 1.20E-01 | 2.20E-01 | 3.33E+00 | 2.49E-02 | 2.79E-01 | 7.13E+01 |
| 65 | Communications | 5 | 6 | None | 0 | | | | | | | | | | | | | |
| 66 | Unmanned Aerial Vehicle (UAV) Training | 5 | 12 | none | 0 | | | | | | | | | | | | | |
| 67 | Around the World Training | 1 | 6 | none | 0 | | | | | | | | | | | | | |
| **4.9.4** | **Provide/Execute Training for U.S. and Other Nation Units and I** | | | | | | | | | | | | | | | | | |
| | **NSW Physical Fitness Training** | | | | | | | | | | | | | | | | | |
| 68 | Physical Training Runs | 1 | 464 | None | 0 | | | | | | | | | | | | | |
| 69 | Physical Conditioning Training Exercise | 1 | 280 | None | 0 | | | | | | | | | | | | | |
| 70 | Swim Training | 1 | | None | 0 | | | | | | | | | | | | | |
| 71 | Hell Week | 5 | 6 | Smokes | 128 per year | Smoke | | 128 | 1.20E-02 | 1.70E-05 | 2.10E-03 | 1.60E-04 | 1.30E-01 | 1.54E+00 | 2.18E-03 | 2.69E-01 | 2.05E-02 | 1.66E+01 |
| | | | | Grenade Simulators | 200 per year | Grenades | *M116A1* | 200 | 3.70E-04 | 5.60E-03 | 4.20E-05 | 4.70E-04 | 1.20E-01 | 7.40E-02 | 1.12E+00 | 8.40E-03 | 9.40E-02 | 2.40E+01 |
| | | | | White Para Flares | 12 per year | Flares | *M127A1* | 12 | 4.40E-03 | 5.70E-03 | 8.50E-05 | 1.30E-04 | 1.70E-01 | | | | | |
| | | | | 7.62 Blank (A111) | 27000 per year | 7.62 mm | | 27000 | 6.80E-04 | 4.40E-05 | | 3.50E-07 | 1.70E-05 | 1.84E+01 | 1.19E+00 | 0.00E+00 | 9.45E-03 | 4.59E-01 |
| | | | | 50 CAL Blank | 2000 per year | 0.5 cal | | 2000 | 1.80E-03 | 2.80E-05 | | | 9.80E-05 | 3.60E+00 | 5.60E-02 | 0.00E+00 | 0.00E+00 | 1.96E-01 |
| 72 | Rucksack March | 1 | 54 | None | 0 | | | | | | | | | | | | | |
| 73 | Monster Mash | 1 | 6 | None | | | | | | | | | | | | | | |
| **4.12.6** | **Provide Industrial and Environmental Health Services** | | | | | | | | | | | | | | | | | |
| 74 | Conduct Environmental Health Site Assessment | 3 | 3 | None | 0 | | | | | | | | | | | | | |
| **6.1.1** | **Conduct Explosive Ordnance Disposal** | | | | | | | | | | | | | | | | | |
| 75 | Conventional Ordnance/Improvised Explosive Device Response | 1 | 120 | 0 | | | | | | | | | | | | | | |
| 76 | Land Mine Detection/Neutralization | 1 | 45 | 0 | | | | | | | | | | | | | | |
| **6.3.1** | **Force Protection: Protect and Secure Area of Operations** | | | | | | | | | | | | | | | | | |
| 77 | Field Training Exercise (FTX) e.g. SEAHAWK | 14 | 53 | 0.50 cal blanks | 15650 per year | | | 15650 | 1.10E-02 | 1.20E-03 | | | 3.10E-04 | 1.72E+02 | 1.88E+01 | 0.00E+00 | 0.00E+00 | 4.85E+00 |
| | | | | Grenades/flares | 66 per year | Grenades | *M116A1* | 66 | 3.70E-04 | 5.60E-03 | 4.20E-05 | 4.70E-04 | 1.20E-01 | 2.44E-02 | 3.70E-01 | 2.77E-03 | 3.10E-02 | 7.92E+00 |
| | | | | M16 Rounds | 8250 per year | | | 8250 | 7.80E-03 | 9.80E-05 | | | 1.40E-03 | | | | | |
| | | | | M60 Rounds | 8250 per year | | | 8250 | 7.80E-03 | 9.80E-05 | | | 1.40E-03 | | | | | |
| | | | | 9mm Rounds | 6600 per year | | | 6600 | 3.10E-04 | 1.50E-05 | | 8.20E-08 | 2.40E-05 | 2.05E+00 | 9.90E-02 | 0.00E+00 | 5.41E-04 | 1.58E-01 |
| **6.3.3** | **Combat Terrorism** | | | | | | | | | | | | | | | | | |
| 78 | Small Boat Attack | 1 | 36 | .50 cal rounds | 350 per exercise | | | 12600 | 1.80E-03 | 2.80E-05 | | | 9.80E-05 | 2.27E+01 | 3.53E-01 | 0.00E+00 | 0.00E+00 | 1.23E+00 |
| | | | | | | | | | | | | **lbs/year** | | 466.4772 | 43.336704 | 4.82412 | 115.25298 | 705.40229 |
| | | | | | | | | | | | | **tons/year** | | 0.2332386 | 0.0216684 | 0.0024121 | 0.0576265 | 0.3527011 |

Ordnance and explosives emission factors from AP-42

| Scenario | | Type Training | Reference | Days (a) | Operations (b) | Aircraft | Number | Aircraft Time on Range (hrs) | Aircraft Fuel Use per hour | Total Fuel Use | Emissions Factors (lb/gallon fuel) (c) | | | Emissions Factors (lb/operation) (c) | | | Emissions (lbs) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | CO2 | CH4 | N2O | CO2 | CH4 | N2O | CO2 | CH4 | N2O |
| **1.1.2** | **Conduct Maneuver - Move Forces** | | | | | | | | | | | | | | | | | | |
| 1 | Anchoring | | | 1 | 72 | None | 0 | | | | | | | | | | | | |
| 2 | Towing | | | 1 | 30 | None | 0 | | | | | | | | | | | | |
| 3 | Moor to Buoy | | | 1 | 36 | None | 0 | | | | | | | | | | | | |
| **1.3.1** | **Perform Mine Countermeasures** | | | | | | | | | | | | | | | | | | |
| 4 | Parachute Operations | | | 1 | 228 | SH60 | 1 | 1.0 | 1200.0 | 1200.0 | 21.10 | 0.00 | 0.00 | 3565.92 | 0.10 | 0.12 | 813029.3257 | 22.938131 | 26.336373 |
| 5 | MCM Operations | | | 1 | 58 | None | 0 | | | | | | | | | | | | |
| 6 | Floating Mine Operations | | | 1 | 53 | SH-60 - 2 Hours | 1 | 2.0 | 1200.0 | 2400.0 | 21.10 | 0.00 | 0.00 | 7131.84 | 0.20 | 0.23 | 755974.6361 | 21.328438 | 24.488207 |
| 7 | Dive Platoon | | | 1 | 8 | SH-60 - 2 Hours | 1 | 2.0 | 1200.0 | 2400.0 | 21.10 | 0.00 | 0.00 | 7131.84 | 0.20 | 0.23 | 114109.379 | 3.2193869 | 3.6963331 |
| 8 | Very Shallow Water (VSW) Operator Course | | | 8 | 6 | None | 0 | | | | | | | | | | | | |
| 9 | VSW Mine Countermeasure Operations | | | 1 | 156 | None | 0 | | | | | | | | | | | | |
| 10 | Autonomous Underwater Vehicle (AUV) Operations/UUV Operations | | | 1 | 156 | None | 0 | | | | | | | | | | | | |
| 11 | MK8 Marine Mammal/MMS Operations | | | 1 | 208 | None | 0 | | | | | | | | | | | | |
| 12 | Mine Neutralization | | | 1 | 4 | SH-60 - 2 Hours | 1 | 2.0 | 1200.0 | 2400.0 | 21.10 | 0.00 | 0.00 | 7131.84 | 0.20 | 0.23 | 57054.68952 | 1.6096934 | 1.8481665 |
| N1 | Shock Wave Generator | | | 1 | 90 | None | | | | | | | | | | | | | |
| N2 | Surf Zone Test Detachment/Equipment T&E | | | 1 | 200 | None | | | | | | | | | | | | | |
| N3 | UUV Neutralization | | | 1 | 4 | None | | | | | | | | | | | | | |
| N4 | Mine Hunting | | | 1 | 200 | SH-60 - 1.5 Hours cruise | 1 | 1.5 | 1200.0 | 1800.0 | 21.10 | 0.00 | 0.00 | 5348.88 | 0.15 | 0.17 | 1604663.143 | 45.272628 | 51.979684 |
| | | | | 1 | 200 | Hover | 1 | 0.5 | 1200.0 | 600.0 | 21.10 | 0.00 | 0.00 | 1782.96 | 0.05 | 0.06 | 178295.9048 | 5.030292 | 5.7755204 |
| N5 | Airborne Laser Mine Detection | | | 1 | 48 | SH-60 - 1.5 Hours cruise | 1 | 1.5 | 1200.0 | 1800.0 | 21.10 | 0.00 | 0.00 | 5348.88 | 0.15 | 0.17 | 385119.1543 | 10.865431 | 12.475124 |
| | | | | 1 | 48 | Hover | 1 | 0.5 | 1200.0 | 600.0 | 21.10 | 0.00 | 0.00 | 1782.96 | 0.05 | 0.06 | 42791.01714 | 1.2072701 | 1.3861249 |
| N6 | Organic Airborne Surface Influence Sweep | | | 1 | 100 | SH-60 - 1.5 Hours cruise | 1 | 1.5 | 1200.0 | 1800.0 | 21.10 | 0.00 | 0.00 | 5348.88 | 0.15 | 0.17 | 802331.5714 | 22.636314 | 25.989842 |
| | | | | 1 | 100 | Hover | 1 | 0.5 | 1200.0 | 600.0 | 21.10 | 0.00 | 0.00 | 1782.96 | 0.05 | 0.06 | 89147.95238 | 2.515146 | 2.8877602 |
| N7 | Airborne Mine Neutralization | | | 1 | 48 | SH-60 - 1.5 Hours cruise | 1 | 1.5 | 1200.0 | 1800.0 | 21.10 | 0.00 | 0.00 | 5348.88 | 0.15 | 0.17 | 385119.1543 | 10.865431 | 12.475124 |
| | | | | 1 | 48 | Hover | 1 | 0.5 | 1200.0 | 600.0 | 21.10 | 0.00 | 0.00 | 1782.96 | 0.05 | 0.06 | 42791.01714 | 1.2072701 | 1.3861249 |
| **1.4.6** | **Conduct Maritime Interception** | | | | | | | | | | | | | | | | | | |
| 13 | Visit, Board, Search and Seizure | | | 1 | 42 | None | 0 | | | | | | | | | | | | |
| **1.5.4** | **Conduct Amphibious Operations** | | | | | | | | | | | | | | | | | | |
| 14 | Small Boat Handling | | | 1 | 94 | None | 0 | | | | | | | | | | | | |
| 15 | Swimmer Conditioning - Bay and Ocean with fins | | | 1 | 189 | None | 0 | | | | | | | | | | | | |
| 16 | Basic Reconnaissance Course Final Mission | | | 1 | 8 | SH60 | 1 | 4.0 | 1200.0 | 4800.0 | 21.10 | 0.00 | 0.00 | 14263.67 | 0.40 | 0.46 | 456437.5162 | 12.877547 | 14.785332 |
| 17 | Obstacle Course | | | 1 | 142 | None | 0 | | | | | | | | | | | | |
| 18 | Hydrographic Reconnaissance | | | 1 | 44 | None | 0 | | | | | | | | | | | | |
| 19 | Surf Observations (SUROBS) | | | 1 | 116 | None | 0 | | | | | | | | | | | | |
| 20 | CRRC Inflatable Boat Small (IBS)/Surf Passage/Boat Team Organization and Function | | | 1 | 72 | None | 0 | | | | | | | | | | | | |
| 21 | CRRC Towing and High Speed Maneuver | | | 1 | 8 | None | 0 | | | | | | | | | | | | |
| 22 | CRRC Bay Landing Craft Utility (LCU) Launch and Recover - Bay and Ocean | | | 1 | 24 | None | 0 | | | | | | | | | | | | |
| 23 | CRRC Navigation, Bay and Ocean Runs | | | 1 | 26 | None | 0 | | | | | | | | | | | | |
| 24 | Amphibious Raid Course Final Mission | | | 1 | 24 | None | 0 | | | | | | | | | | | | |
| 25 | Amphibious Raid Operations | | | 3 | 18 | CH-53E | 3 | 4.0 | 4464.0 | 17856.0 | 21.10 | 0.00 | 0.00 | 53060.86 | 1.50 | 1.72 | 34383438.09 | 970.06565 | 1113.7791 |
| | | | | | | CH-46E | 4 | 4.0 | 1120.0 | 4480.0 | 21.10 | 0.00 | 0.00 | 13312.76 | 0.38 | 0.43 | 11502225.41 | 324.5142 | 372.59037 |
| | | | | | | CH-53E T&G | 3 | 1.0 | 274.0 | 274.0 | 21.10 | 0.00 | 0.00 | 814.22 | 0.02 | 0.03 | 131903.3103 | 3.72141 | 4.27273 |
| | | | | | | CH-46E T&G | 4 | 1.0 | 97.0 | 97.0 | 21.10 | 0.00 | 0.00 | 288.25 | 0.01 | 0.01 | 62260.92994 | 1.756578 | 2.0168117 |
| | | | | | | UH-1N | 1 | 4.0 | 692.0 | 2768.0 | 21.10 | 0.00 | 0.00 | 8225.38 | 0.23 | 0.27 | 1776683.032 | 50.125854 | 57.551906 |
| 26 | Direct Action (DA) Operations | | | 3 | 18 | CH-46E | 7 | 4.0 | 1120.0 | 4480.0 | 21.10 | 0.00 | 0.00 | 13312.76 | 0.38 | 0.43 | 20128894.46 | 567.89984 | 652.03315 |
| | | | | | | UH-1N | 1 | 4.0 | 692.0 | 2768.0 | 21.10 | 0.00 | 0.00 | 8225.38 | 0.23 | 0.27 | 1776683.032 | 50.125854 | 57.551906 |
| 27 | Craft Landing Zone (CLZ) | | | 1 | 4 | None | 0 | | | | | | | | | | | | |
| N8 | Tactical Recovery of Aircraft and Personnel | | | 1 | 4 | CH-46E / CH-53E | 3 | 4.0 | 1120.0 | 4480.0 | 21.10 | 0.00 | 0.00 | 13312.76 | 0.38 | 0.43 | 639012.5226 | 18.028566 | 20.699465 |
| | | | | 1 | 4 | AH-1W | 1 | 4.0 | 786.4 | 3145.6 | 21.10 | 0.00 | 0.00 | 9347.46 | 0.26 | 0.30 | 149559.3595 | 4.2195431 | 4.8446605 |
| | | | | 1 | 4 | UH-1N | 1 | 4.0 | 692.0 | 2768.0 | 21.10 | 0.00 | 0.00 | 8225.38 | 0.23 | 0.27 | 131606.1505 | 3.7130262 | 4.2631041 |
| **1.5.7** | **Conduct Naval Special Warfare** | | | | | | | | | | | | | | | | | | |
| 28 | Swimmer/Combat Rubber Raiding Craft Over-the-Beach | | | 4 | 86 | SH-60 Helo | 1 | 1.0 | 1200.0 | 1200.0 | 21.10 | 0.00 | 0.00 | 3565.92 | 0.10 | 0.12 | 1226675.825 | 34.608409 | 39.735581 |
| 29 | Over-the-Beach Stalk | | | 1 | 24 | SH-60 Helo | 1 | 1.0 | 1200.0 | 1200.0 | 21.10 | 0.00 | 0.00 | 3565.92 | 0.10 | 0.12 | 85582.03428 | 2.4145402 | 2.7722498 |
| 30 | Immediate Action Drills | | | 1 | 12 | SH-60 Helo | 1 | 1.0 | 1200.0 | 1200.0 | 21.10 | 0.00 | 0.00 | 3565.92 | 0.10 | 0.12 | 42791.01714 | 1.2072701 | 1.3861249 |
| 31 | Breacher Training | | | 1 | 20 | None | | | | | | | | | | | | | |
| 32 | Amphibious Warfare Exercise | | | 1 | 84 | None | | | | | | | | | | | | | |
| 33 | Mobility Primary Mission Area | | | 1 | 200 | None | | | | | | | | | | | | | |
| 34 | Escape and Evasion | | | 1 | 84 | None | | | | | | | | | | | | | |
| N9 | Underwater Demolition Qualification / Certification | | | 1 | 12 | None | | | | | | | | | | | | | |
| N10 | Vehicle Patrolling and Testing | | | 1 | 50 | None | | | | | | | | | | | | | |
| N11 | NSW Demolition Traning: Demolition Requalifications and Training (Underwater Detonations) | | | 1 | 12 | None | | | | | | | | | | | | | |
| **2.2.3** | **Perform Tactical Reconnaissance and Surveillance** | | | | | | | | | | | | | | | | | | |
| 35 | Helicopter Rope Suspension Training/Cast & Recovery Operation | | | 1 | 154 | SH60 | 1 | 1.0 | 1200.0 | 1200.0 | 21.10 | 0.00 | 0.00 | 3565.92 | 0.10 | 0.12 | 549151.3866 | 15.493299 | 17.788603 |
| | | | | 1 | 154 | CH46 | 1 | 1.0 | 1120.0 | 1120.0 | 21.10 | 0.00 | 0.00 | 3328.19 | 0.09 | 0.11 | 512541.2942 | 14.460413 | 16.602696 |
| 36 | Rappel and Fast Rope Training | | | 1 | 11 | NONE | 0 | | | | | | | | | | | | |
| 37 | SEAL Delivery Vehicle (SDV)/Advanced Seal Delivery System (ASDS) Certification to Deploy | | | 14 | 40 | SH-60 | 1 | 1.0 | 1200.0 | 1200.0 | 21.10 | 0.00 | 0.00 | 3565.92 | 0.10 | 0.12 | 1996914.133 | 56.33927 | 64.685829 |

| Scenario | | Type Training | Reference | Days (a) | Operations (b) | Aircraft | Number | Aircraft Time on Range (hrs) | Aircraft Fuel Use per hour | Total Fuel Use | Emissions Factors (lb/gallon fuel) (c) | | | Emissions Factors (lb/operation) (c) | | | Emissions (lbs) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | CO2 | CH4 | N2O | CO2 | CH4 | N2O | CO2 | CH4 | N2O |
| **4.5.6** | **Construct, Maintain, and Operate Logistics Over-the-Shore** | | | | | | | | | | | | | | | | | | |
| 38 | OPDS | | | 25 | 6 | None | 0 | | | | | | | | | | | | |
| 39 | Amphibious Bulk Liquid Transfer System (ABLTS) | | | 10 | 5 | None | 0 | | | | | | | | | | | | |
| 40 | Barge Ferry/Causeway Coxswain Training | | | 3 | 54 | None | 0 | | | | | | | | | | | | |
| 41 | Causeway Pier Insertion and Retraction | | | 5 | 10 | None | 0 | | | | | | | | | | | | |
| 42 | Elevated Causeway System (ELCAS) | | | 10 | 4 | None | 0 | | | | | | | | | | | | |
| 43 | Establish Beach Party Command Post | | | 4 | 16 | None | 0 | | | | | | | | | | | | |
| 44 | Sterngate Marriage to Amphibious Ship/LCU | | | 1 | 40 | None | 0 | | | | | | | | | | | | |
| 45 | LCU/LCM Beaching | | | 1 | 60 | None | 0 | | | | | | | | | | | | |
| 46 | LCU/LCM Towing/Being Towed | | | 1 | 60 | None | 0 | | | | | | | | | | | | |
| 47 | Communications Training | | | 2 | 2 | None | 0 | | | | | | | | | | | | |
| 48 | Field Training Exercise with a Beach Camp | | | 14 | 2 | None | 0 | | | | | | | | | | | | |
| 49 | Maritime Pre-positioning Ships (MPS) Offload | | | 5 | 2 | None | 0 | | | | | | | | | | | | |
| 50 | Reverse Osmosis Water Purification Unit | | | 4 | 4 | None | 0 | | | | | | | | | | | | |
| 51 | Roll-on/Roll-off Discharge Facility | | | 5 | 2 | None | 0 | | | | | | | | | | | | |
| 52 | MPF Utility Boat Operator Course | | | 9 | 2 | None | 0 | | | | | | | | | | | | |
| 53 | LARC V Operator Training | | | 6 | 1 | None | 0 | | | | | | | | | | | | |
| **4.9.1** | **Conduct Mission Area Training** | | | | | | | | | | | | | | | | | | |
| | **NSW Diving and Beach Operations** | | | | | | | | | | | | | | | | | | |
| 54 | Lung Automatic Rebreather (LAR) V Closed Circuit Breathing Diving | | | 1 | 126 | None | 0 | | | | | | | | | | | | |
| 55 | Open Circuit Breathing Diving | | | 1 | 12 | None | 0 | | | | | | | | | | | | |
| 56 | OTB Field Training Exercise | | | 5 | 36 | None | 0 | | | | | | | | | | | | |
| 57 | Rock Portage | | | 1 | 20 | None | 0 | | | | | | | | | | | | |
| | **NSW Land Warfare** | | | | | | | | | | | | | | | | | | |
| 58 | Land Patrolling | | | 1 | 18 | None | 0 | | | | | | | | | | | | |
| 59 | Immediate Action Drills | | | 1 | 6 | None | 0 | | | | | | | | | | | | |
| | **NSW Advanced Training** | | | | | | | | | | | | | | | | | | |
| 60 | Over the Beach Insertion / Photo Reconnaissance | | | 1 | 31 | None | 0 | | | | | | | | | | | | |
| 61 | Photo Image Capture | | | 14 | 4 | None | 0 | | | | | | | | | | | | |
| 62 | Field Skills (Observation Drill, Sketching, Range Estimation) | | | 1 | 24 | None | 0 | | | | | | | | | | | | |
| 63 | Stalking, Movement and Hide-Sites | | | 5 | 8 | None | 0 | | | | | | | | | | | | |
| 64 | CQC/CQD | | | 1 | 198 | SH-60 | 1 | 3.0 | 1200.0 | 3600.0 | 21.10 | 0.00 | 0.00 | 10697.75 | 0.30 | 0.35 | 6354466.045 | 179.27961 | 205.83955 |
| 65 | Communications | | | 5 | 6 | None | 0 | | | | | | | | | | | | |
| 66 | Unmanned Aerial Vehicle (UAV) Training | | | 5 | 12 | UAV | 2 | | | | | | | | | | | | |
| 67 | Around the World Training | | | 1 | 6 | None | 0 | | | | | | | | | | | | |
| **4.9.4** | **Provide/Execute Training for U.S. and Other Nation Units and Individuals** | | | | | | | | | | | | | | | | | | |
| | **NSW Physical Fitness Training** | | | | | | | | | | | | | | | | | | |
| 68 | Physical Training Runs | | | 1 | 464 | None | 0 | | | | | | | | | | | | |
| 69 | Physical Conditioning Training Exercise | | | 1 | 280 | None | 0 | | | | | | | | | | | | |
| 70 | Swim Training | | | 1 | 172 | None | 0 | | | | | | | | | | | | |
| 71 | Hell Week | | | 5 | 6 | None | 0 | | | | | | | | | | | | |
| 72 | Rucksack March | | | 1 | 54 | None | 0 | | | | | | | | | | | | |
| 73 | Monster Mash | | | 1 | 6 | None | 0 | | | | | | | | | | | | |
| **4.12.6** | **Provide Industrial and Environmental Health Services** | | | | | | | | | | | | | | | | | | |
| 74 | Conduct Environmental Health Site Assessment | | | 3 | 3 | None | 0 | | | | | | | | | | | | |
| **6.1.1** | **Conduct Explosive Ordnance Disposal** | | | | | | | | | | | | | | | | | | |
| 75 | Conventional Ordnance/Improvised Explosive Device Response | | | 1 | 120 | None | | | | | | | | | | | | | |
| 76 | Land Mine Detection/Neutralization | | | 1 | 45 | None | | | | | | | | | | | | | |
| **6.3.1** | **Force Protection: Protect and Secure Area of Operations** | | | | | | | | | | | | | | | | | | |
| 77 | Field Training Exercise (FTX) e.g. SEAHAWK | | | 14 | 53 | None | 0 | | | | | | | | | | | | |
| **6.3.3** | **Combat Terrorism** | | | | | | | | | | | | | | | | | | |
| 78 | Small Boat Attack | | | 1 | 36 | None | 0 | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | **87177252.5** | **2459.546309** | **2823.92354** |

| | CO2 | CH4 | N2O |
|---|---|---|---|
| **Emissions, short tons/year** | **43588.63** | **1.23** | **1.41** |
| **Emissions, metric tons/year** | **39543.34** | **1.12** | **1.28** |

Assumptions: Assume that SH-60 and CH-46 operation for Cast and Recovery are Special Personnel Insertion and Extraction Rig operations.
Assume 4 hours of cruise time for Amphibious Raid Operations, and one touch and go operation
SH60 from AESO Memorandum Report No. 9929, February 1999
CH53 from AESO Memorandum Report No. 9822 Rev C, February 2000
CH46 from AESO Memorandum Report No. 9816 Rev F, January 2001
UH1N from AESO Memorandum Report No. 9904 Rev A, May 1999
AH-1W from AESO Memorandum Report No. 9824 Rev A, April 1999
Assume Aircraft participate for one day during Amphibious Raid Operations and Direct Action Operations
Assume 1 LTO and 3 hours of cruise for CQC/CQD SH-60 operation.
(a) Days = the number of days per operation
(b) Operations = the number of operations per year

| Scenario | Type Training | Reference | Days (a) | Operations (b) | Ship/Boat Type | Number | Ship Time on Range (hrs) (e) | Engines and Generators | | | | Ave. Speed (Knots) | Power Level (%) or horsepower | Engines on Line | Generator - Load (kW) | Ship hp | Ship Load Factor | kW | Fuel Use, g/kWh | Fuel Use, gallons/hr | Emissions Factors (lb/hr) (c) | | | Emissions, (lbs/year) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Hours | Propulsion | No. | Generator | No. | | | | | | | | | | CO2 | CH4 | N2O | CO2 | CH4 | N2O |
| **1.1.2** | **Conduct Maneuver - Move Forces** | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | Anchoring | | 1 | 72 | RHIB | 1 | 4 | Caterpillar 3126 Diesels | 2 | None | 0 | 1-2 | 600 | 2 | NA | 940 | 100% | 700.958 | 220 | 48 | 1070.714 | 0.1 | 0.0 | 308365.6711 | 22.48183 | 7.899022 |
| | | | 1 | 72 | Ship (DDG or CG) | 1 | 4 | GE LM 2500 | 4 | Allison 501-K34, 2,000 kW ea | 3 | 4-6 | 2.5% | 2 | 2@1300kW ea | 104960 | 35% | 78268.67 | 246 | 5980 | 133816.4 | 9.8 | 3.4 | 38539135.74 | 2809.75 | 987.2094 |
| 2 | Towing | | 1 | 30 | Foss Tug | 1 | 4 | Foster Wheeler/ Babcock & Wilcox | 2 | NA - No separate emissions | 0 | 7 | 25% | 2 | NA | 4000 | 35% | 2982.8 | 246 | 228 | 5099.712 | 0.4 | 0.1 | 611965.4431 | 44.6162 | 15.67596 |
| | | | 1 | 30 | Ship (DDG or CG) | 1 | 4 | GE LM 2500 | 4 | Allison 501-K34, 2,000 kW ea | 3 | 4-6 | 2.5% | 2 | 2@1300kW ea | 104960 | 35% | 78268.67 | 246 | 5980 | 133816.4 | 9.8 | 3.4 | 16057973.23 | 1170.729 | 411.3372 |
| 3 | Moor to Buoy | | 1 | 36 | RHIB | 1 | 4 | Caterpillar 3126 Diesels | 2 | None | 0 | 1-2 | 600 | 2 | NA | 940 | 100% | 700.958 | 220 | 48 | 1070.714 | 0.1 | 0.0 | 154182.8355 | 11.24092 | 3.949511 |
| | | | 1 | 36 | Ship (DDG or CG) | 1 | 4 | GE LM 2500 | 4 | Allison 501-K34, 2,000 kW ea | 3 | 4-6 | 2.5% | 2 | 2@1300kW ea | 104960 | 35% | 78268.67 | 246 | 5980 | 133816.4 | 9.8 | 3.4 | 19269567.87 | 1404.875 | 493.6047 |
| **1.3.1** | **Perform Mine Countermeasures** | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | Parachute Operations | | 1 | 228 | RHIBs | 3 | 4 | Caterpillar 3126 Diesels | 2 | None | 0 | 1-2 | 600 | 2 | NA | 940 | 100% | 700.958 | 220 | 48 | 1070.714 | 0.1 | 0.0 | 2929473.875 | 213.5774 | 75.04071 |
| 5 | MCM Operations | | 1 | 58 | Zodiacs | 1 | 4 | OMC Outboard, 55 hp (d) | 1 | None | 0 | 2 | 600-800 | 1 | NA | 55 | 100% | 41.0135 | 220 | 3 | 62.64817 | 0.0 | 0.0 | 14534.37486 | 1.059649 | 0.372309 |
| 6 | Floating Mine Operations | | 1 | 53 | RHIBs | 2 | 4 | Caterpillar 3126 Diesels | 2 | None | 0 | 1-2 | 600 | 2 | NA | 940 | 100% | 700.958 | 220 | 48 | 1070.714 | 0.1 | 0.0 | 453982.7935 | 33.09825 | 11.62912 |
| 7 | Dive Platoon | | 1 | 8 | RHIB | 2 | 4 | Caterpillar 3126 Diesels | 2 | None | 0 | 1-2 | 600 | 2 | NA | 940 | 100% | 700.958 | 220 | 48 | 1070.714 | 0.1 | 0.0 | 68525.70468 | 4.995963 | 1.755338 |
| 8 | Very Shallow Water (VSW) Operator Course | | 8 | 6 | RHIBs / Water-Jet Driven Craft | 2 | 2 | Caterpillar 3126 Diesels | 2 | None | 0 | 1-2 | 600 | 2 | NA | 940 | 100% | 700.958 | 220 | 48 | 1070.714 | 0.1 | 0.0 | 205577.114 | 14.98789 | 5.266015 |
| 9 | VSW Mine Countermeasure Operations | | 1 | 156 | RHIBs / Water-Jet Driven Craft | 3 | 2 | Caterpillar 3126 Diesels | 2 | None | 0 | 1-2 | 600 | 2 | NA | 940 | 100% | 700.958 | 220 | 48 | 1070.714 | 0.1 | 0.0 | 1002188.431 | 73.06595 | 25.67182 |
| 10 | Autonomous Underwater Vehicle (AUV) Operations/UUV Operatic | | 1 | 156 | RHIBs / Water-Jet Driven Craft | 2 | 2 | Caterpillar 3126 Diesels | 2 | None | 0 | 1-2 | 600 | 2 | NA | 940 | 100% | 700.958 | 220 | 48 | 1070.714 | 0.1 | 0.0 | 668125.6206 | 48.71064 | 17.11455 |
| | | | 1 | 156 | Submersible | 2 | 2 | | | | | | | | | | | | | | | | | | | |
| 11 | MK8 Marine Mammal/MMS Operations | | 1 | 208 | RHIBs / Water-Jet Driven Craft | 4 | 2 | Caterpillar 3126 Diesels | 2 | None | 0 | 1-2 | 600 | 2 | NA | 940 | 100% | 700.958 | 220 | 48 | 1070.714 | 0.1 | 0.0 | 1781668.322 | 129.895 | 45.63879 |
| 12 | Mine Neutralization | | 1 | 4 | RHIBs / Water-Jet Driven Craft | 2 | 2 | Caterpillar 3126 Diesels | 2 | None | 0 | 1-2 | 600 | 2 | NA | 940 | 100% | 700.958 | 220 | 48 | 1070.714 | 0.1 | 0.0 | 17131.42617 | 1.248991 | 0.438835 |
| N1 | Shock Wave Generator | | 1 | 90 | CRRC | 1 | 4 | OMC Outboard, 55 hp (d) | 1 | None | 0 | 2 | 600-800 | 1 | NA | 55 | 100% | 41.0135 | 220 | 3 | 62.64817 | 0.0 | 0.0 | 22553.3403 | 1.644283 | 0.577721 |
| | | | 1 | 90 | LCM-8 | 1 | 4 | GM Detroit, V12-71N 460bhp | 2 | 3-71 GM Detroit, 40 kW | 2 | 10 | 2000 rpm (97%) | 2 | 2@ 7kW ea | 940 | 100% | 700.958 | 220 | 48 | 1070.714 | 0.1 | 0.0 | 385457.0888 | 28.10229 | 9.873778 |
| N2 | Surf Zone Test Detachment/Equipment T&E | | 1 | 200 | RHIB / Water-Jet Driven Craft / CRRC | 2 | 4 | Caterpillar 3126 Diesels | 2 | None | 0 | 1-2 | 600 | 2 | NA | 940 | 100% | 700.958 | 220 | 48 | 1070.714 | 0.1 | 0.0 | 1713142.617 | 124.8991 | 43.88346 |
| N3 | UUV Neutralization | | 1 | 4 | RHIBs | 2 | 2 | Caterpillar 3126 Diesels | 2 | None | 0 | 1-2 | 600 | 2 | NA | 940 | 100% | 700.958 | 220 | 48 | 1070.714 | 0.1 | 0.0 | 17131.42617 | 1.248991 | 0.438835 |
| N4 | Mine Hunting | | 2 | 6 | Acoustic Explorer (mine seeding & maint | 1 | 12 | GM-16-V-92N Diesel | 2 | GM Detroit Diesel 6-71, 75 kW | 2 | 3 | 30% 550 rpm | 2 | 49 kW | 940 | 100% | 700.958 | 220 | 48 | 1070.714 | 0.1 | 0.0 | 154182.8355 | 11.24092 | 3.949511 |
| N5 | Airborne Laser Mine Detection | | 1 | 48 | None | | | | | | | | | | | | | | | | | | | | | |
| N6 | Organic Airborne Surface Influence Sweep | | 1 | 100 | None | | | | | | | | | | | | | | | | | | | | | |
| N7 | Airborne Mine Neutralization | | 1 | 48 | RHIB | 1 | 12 | Caterpillar 3126 Diesels | 2 | None | 0 | 1-2 | 600 | 2 | NA | 940 | 100% | 700.958 | 220 | 48 | 1070.714 | 0.1 | 0.0 | 616731.3421 | 44.96366 | 15.79804 |
| **1.4.6** | **Conduct Maritime Interception** | | | | | | | | | | | | | | | | | | | | | | | | | |
| 13 | Visit, Board, Search and Seizure | | 1 | 42 | Foss Tug | 1 | 4 | Foster Wheeler/ Babcock & Wilcox | 2 | NA - No separate emissions | 0 | 7 | 25% | 2 | NA | 4000 | 35% | 2982.8 | 246 | 228 | 5099.712 | 0.4 | 0.1 | 856751.6203 | 62.46268 | 21.94635 |
| | | | 1 | 42 | RHIB | 1 | 4 | Caterpillar 3126 Diesels | 2 | None | 0 | 1-2 | 600 | 2 | NA | 940 | 100% | 700.958 | 220 | 48 | 1070.714 | 0.1 | 0.0 | 179879.9748 | 13.1144 | 4.607763 |
| | | | 1 | 42 | Ship (DDG or CG) | 1 | 4 | GE LM 2500 | 4 | Allison 501-K34, 2,000 kW ea | 3 | 4-6 | 2.5% | 2 | 2@1300kW ea | 104960 | 35% | 78268.67 | 246 | 5980 | 133816.4 | 9.8 | 3.4 | 22481162.52 | 1639.021 | 575.8721 |
| **1.5.4** | **Conduct Amphibious Operations** | | | | | | | | | | | | | | | | | | | | | | | | | |
| 14 | Small Boat Handling | | 1 | 94 | CRRC | 4 | 6 | OMC Outboard, 55 hp (d) | 1 | None | 0 | 2 | 600-800 | 1 | NA | 55 | 100% | 41.0135 | 220 | 3 | 62.64817 | 0.0 | 0.0 | 141334.2659 | 10.30417 | 3.620385 |
| 15 | Swimmer Conditioning - Bay and Ocean with fins | | 1 | 189 | Personal Watercraft / CRRC / RHIB | 1 | 1 | Yamaha Outboard, 160 hp (d) | 1 | None | 0 | 2 | 100% | 1 | NA | 160 | 100% | 119.312 | 220 | 8 | 182.2492 | 0.0 | 0.0 | 34445.10155 | 2.511268 | 0.882338 |
| 16 | Basic Reconnaissance Course Final Mission | | 1 | 8 | IBS | 1 | 6 | OMC Outboard, 55 hp (d) | 1 | None | 0 | 2 | 600-800 | 1 | NA | 55 | 100% | 41.0135 | 220 | 3 | 62.64817 | 0.0 | 0.0 | 3007.11204 | 0.219238 | 0.077029 |
| | | | 1 | 8 | LCU | 1 | 6 | GM Detroit, V12-71N 460bhp | 2 | 3-71 GM Detroit, 40 kW | 2 | 10 | 2000 rpm (97%) | 2 | 2@ 7kW ea | 460 | 100% | 343.022 | 220 | 23 | 523.9665 | 0.0 | 0.0 | 25150.39161 | 1.833625 | 0.644246 |
| 17 | Obstacle Course | | 1 | 142 | None | | | | | | | | | | | | | | | | | | | | | |
| 18 | Hydrographic Reconnaissance | | 1 | 44 | Personal Watercraft | 1 | 6 | Yamaha Outboard, 160 hp (d) | 1 | None | 0 | 2 | 100% | 1 | NA | 160 | 100% | 119.312 | 220 | 8 | 182.2492 | 0.0 | 0.0 | 48113.79265 | 3.507804 | 1.232472 |
| | | | 1 | 44 | Small Water Craft | 8 | 6 | OMC Outboard, 55 hp (d) | 1 | None | 0 | 2 | 600-800 | 1 | NA | 55 | 100% | 41.0135 | 220 | 3 | 62.64817 | 0.0 | 0.0 | 132312.9298 | 9.64646 | 3.389297 |
| | | | 1 | 44 | RHIB / CRRC | 1 | 6 | Caterpillar 3126 Diesels | 2 | None | 0 | 1-2 | 600 | 2 | NA | 940 | 100% | 700.958 | 220 | 48 | 1070.714 | 0.1 | 0.0 | 282668.5318 | 20.60835 | 7.24077 |
| | | | 1 | 44 | rigid, 10-meter craft | 1 | 6 | Caterpillar 3126 Diesels | 2 | None | 0 | 1-2 | 600 | 2 | NA | 940 | 100% | 700.958 | 220 | 48 | 1070.714 | 0.1 | 0.0 | 282668.5318 | 20.60835 | 7.24077 |
| 19 | Surf Observations (SUROBS) | | 1 | 116 | None | | | | | | | | | | | | | | | | | | | | | |
| 20 | CRRC Inflatable Boat Small (IBS)/Surf Passage/Boat Team Orga | | 1 | 72 | CRRC/Zodiac/Propeller Surface Craft/RI | 6 | 6 | OMC Outboard, 55 hp (d) | 1 | None | 0 | 2 | 600-800 | 1 | NA | 55 | 100% | 41.0135 | 220 | 3 | 62.64817 | 0.0 | 0.0 | 162384.0502 | 11.83884 | 4.159591 |

| Scenario | Type Training | Reference | Days (a) | Operations (b) | Ship/Boat Type | Number | Ship Time on Range (hrs) (e) | Engines and Generators | | | | Ave. Speed (Knots) | Power Level (%) or horsepower | Engines on Line | Generator - Load (kW) | Ship hp | Ship Load Factor | kW | Fuel Use, g/kWh | Fuel Use, gallons/hr | Emissions Factors (lb/hr) (c) | | | Emissions, (lbs/year) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Hours | Propulsion | No. | Generator | No. | | | | | | | | | | CO2 | CH4 | N2O | CO2 | CH4 | N2O |
| | | | 1 | 72 | Personal Watercraft | 1 | 6 | Yamaha Outboard, 160 hp (d) | 1 | None | 0 | 2 | 100% | 1 | NA | 160 | 100% | 119.312 | 220 | 8 | 182.2492 | 0.0 | 0.0 | 78731.66069 | 5.740042 | 2.016772 |
| 21 | CRRC Towing and High Speed Maneuver | | 1 | 8 | CRRC | 4 | 6 | OMC Outboard, 55 hp (d) | 1 | None | 0 | 2 | 600-800 | 1 | NA | 55 | 100% | 41.0135 | 220 | 3 | 62.64817 | 0.0 | 0.0 | 12028.44816 | 0.876951 | 0.308118 |
| | | | 1 | 8 | Personal Watercraft | 1 | 6 | Yamaha Outboard, 160 hp (d) | 1 | None | 0 | 2 | 100% | 1 | NA | 160 | 100% | 119.312 | 220 | 8 | 182.2492 | 0.0 | 0.0 | 8747.962299 | 0.637782 | 0.224086 |
| 22 | CRRC Bay Landing Craft Utility (LCU) Launch and Recover - Bay | | 1 | 24 | CRRC | 4 | 6 | OMC Outboard, 55 hp (d) | 1 | None | 0 | 2 | 600-800 | 1 | NA | 55 | 100% | 41.0135 | 220 | 3 | 62.64817 | 0.0 | 0.0 | 36085.34448 | 2.630853 | 0.924354 |
| | | | 1 | 24 | Personal Watercraft | 1 | 6 | Yamaha Outboard, 160 hp (d) | 1 | None | 0 | 2 | 100% | 1 | NA | 160 | 100% | 119.312 | 220 | 8 | 182.2492 | 0.0 | 0.0 | 26243.8869 | 1.913347 | 0.672257 |
| | | | 1 | 24 | RHIB | 1 | 6 | Caterpillar 3126 Diesels | 2 | None | 0 | 1-2 | 600 | 2 | NA | 940 | 100% | 700.958 | 220 | 48 | 1070.714 | 0.1 | 0.0 | 154182.8355 | 11.24092 | 3.949511 |
| | | | 1 | 24 | LCU | 1 | 6 | GM Detroit, V12-71N 460bhp | 2 | 3-71 GM Detroit, 40 kW | 2 | 10 | 2000 rpm (97%) | 2 | 2@ 7kW ea | 460 | 100% | 343.022 | 220 | 23 | 523.9665 | 0.0 | 0.0 | 75451.17483 | 5.500874 | 1.932739 |
| 23 | CRRC Navigation, Bay and Ocean Runs | | 1 | 26 | CRRC | 6 | 6 | OMC Outboard, 55 hp (d) | 1 | None | 0 | 2 | 600-800 | 1 | NA | 55 | 100% | 41.0135 | 220 | 3 | 62.64817 | 0.0 | 0.0 | 58638.68479 | 4.275136 | 1.502075 |
| | | | 1 | 26 | RHIB | 1 | 6 | Caterpillar 3126 Diesels | 2 | None | 0 | 1-2 | 600 | 2 | NA | 940 | 100% | 700.958 | 220 | 48 | 1070.714 | 0.1 | 0.0 | 167031.4052 | 12.17766 | 4.278637 |
| 24 | Amphibious Raid Course Final Mission | | 1 | 24 | LCU | 2 | 2 | GM Detroit, V12-71N 460bhp | 2 | 3-71 GM Detroit, 40 kW | 2 | 10 | 2000 rpm (97%) | 2 | 2@ 7kW ea | 920 | 100% | 686.044 | 220 | 47 | 1047.933 | 0.1 | 0.0 | 100601.5664 | 7.334498 | 2.576986 |
| | | | 1 | 24 | CRRCs | 12 | 2 | OMC Outboard, 55 hp (d) | 1 | None | 0 | 2 | 600-800 | 1 | NA | 55 | 100% | 41.0135 | 220 | 3 | 62.64817 | 0.0 | 0.0 | 36085.34448 | 2.630853 | 0.924354 |
| 25 | Amphibious Raid Operations | | 3 | 18 | CRRCs | 13 | 2 | OMC Outboard, 55 hp (d) | 1 | None | 0 | 2 | 600-800 | 1 | NA | 55 | 100% | 41.0135 | 220 | 3 | 62.64817 | 0.0 | 0.0 | 87958.02718 | 6.412703 | 2.253112 |
| | | | 3 | 18 | LPD | 1 | 2 | Foster Wheeler/ Babcock & Wilcox | 2 | NA - No separate emissions | 0 | 7 | 25% | 2 | NA | 4000 | 35% | 2982.8 | 246 | 228 | 5099.712 | 0.4 | 0.1 | 550768.8987 | 40.15458 | 14.10837 |
| | | | 3 | 18 | LCUs | 2 | 2 | GM Detroit, V12-71N 460bhp | 2 | 3-71 GM Detroit, 40 kW | 2 | 10 | 2000 rpm (97%) | 2 | 2@ 7kW ea | 920 | 100% | 686.044 | 220 | 47 | 1047.933 | 0.1 | 0.0 | 226353.5245 | 16.50262 | 5.798218 |
| | | | 3 | 18 | LCACs | 2 | 2 | Avco Lycoming TF-40B 3,955 hp each | 4 | APU T-62-T-40-7 Sunstrand 60 kW each | 2 | 35 | 80% | 4 | 2@ 10kW ea | 11820 | 35% | 8814.174 | 246 | 673 | 15069.65 | 1.1 | 0.4 | 3255044.192 | 237.3136 | 83.38044 |
| | | | 3 | 18 | EFV | 6 | 2 | | | | | | | | | | | | | | 0 | 0.0 | 0.0 | 0 | 0 | 0 |
| 26 | Direct Action (DA) Operations | | 3 | 18 | CRRCs | 9 | 2 | OMC Outboard, 55 hp (d) | 1 | None | 0 | 2 | 600-800 | 1 | NA | 55 | 100% | 41.0135 | 220 | 3 | 62.64817 | 0.0 | 0.0 | 60894.01882 | 4.439564 | 1.559847 |
| | | | 3 | 18 | LPD | 1 | 2 | Foster Wheeler/ Babcock & Wilcox | 2 | NA - No separate emissions | 0 | 7 | 25% | 2 | NA | 4000 | 35% | 2982.8 | 246 | 228 | 5099.712 | 0.4 | 0.1 | 550768.8987 | 40.15458 | 14.10837 |
| 27 | Craft Landing Zone (CLZ) | | 1 | 4 | 1 LCAC per CLZ | 1 | 2 | Avco Lycoming TF-40B 3,955 hp each | 4 | APU T-62-T-40-7 Sunstrand 60 kW each | 2 | 35 | 80% | 4 | 2@ 10kW ea | 7910 | 35% | 5898.487 | 246 | 451 | 10084.68 | 0.7 | 0.3 | 80677.44424 | 5.881902 | 2.066614 |
| N8 | Tactical Recovery of Aircraft and Personnel | | 1 | 4 | None | | | | | | | | | | | | | | | | | | | | | |
| 1.5.7 | **Conduct Naval Special Warfare** | | | | | | | | | | | | | | | | | | | | | | | | | |
| 28 | Swimmer/Combat Rubber Raiding Craft Over-the-Beach | | 4 | 86 | RHIBs / CRRCs | 3 | 2 | Caterpillar 3126 Diesels | 2 | None | 0 | 1-2 | 600 | 2 | NA | 940 | 100% | 700.958 | 220 | 48 | 1070.714 | 0.1 | 0.0 | 2209953.976 | 161.1198 | 56.60966 |
| | | | 4 | 86 | Rigid, 10-meter craft | 1 | 2 | Caterpillar 3126 Diesels | 2 | None | 0 | 1-2 | 600 | 2 | NA | 940 | 100% | 700.958 | 220 | 48 | 1070.714 | 0.1 | 0.0 | 736651.3253 | 53.7066 | 18.86989 |
| 29 | Over-the-Beach Stalk | | 1 | 24 | CRRCs | 1 | 2 | OMC Outboard, 55 hp (d) | 1 | None | 0 | 2 | 600-800 | 1 | NA | 55 | 100% | 41.0135 | 220 | 3 | 62.64817 | 0.0 | 0.0 | 3007.11204 | 0.219238 | 0.077029 |
| | | | 1 | 24 | Boston Whaler | 1 | 2 | OMC Johnson Outboards (d) | 2 | None | 0 | 2-3 | 1000 | 2 | NA | 160 | 100% | 119.312 | 220 | 8 | 182.2492 | 0.0 | 0.0 | 8747.962299 | 0.637782 | 0.224086 |
| 30 | Immediate Action Drills | | 1 | 12 | RHIBs | 1 | 2 | Caterpillar 3126 Diesels | 2 | None | 0 | 1-2 | 600 | 2 | NA | 940 | 100% | 700.958 | 220 | 48 | 1070.714 | 0.1 | 0.0 | 25697.13925 | 1.873486 | 0.658252 |
| | | | 1 | 12 | CRRCs | 1 | 2 | OMC Outboard, 55 hp (d) | 1 | None | 0 | 2 | 600-800 | 1 | NA | 55 | 100% | 41.0135 | 220 | 3 | 62.64817 | 0.0 | 0.0 | 1503.55602 | 0.109619 | 0.038515 |
| 31 | Breacher Training | | 1 | 20 | None | 0 | | | | | | | | | | | | | | | | | | | | |
| 32 | Amphibious Warfare Exercise | | 1 | 84 | RHIBs | 2 | 2 | Caterpillar 3126 Diesels | 2 | None | 0 | 1-2 | 600 | 2 | NA | 940 | 100% | 700.958 | 220 | 48 | 1070.714 | 0.1 | 0.0 | 359759.9496 | 26.2288 | 9.215526 |
| | | | 1 | 84 | MK V | 2 | 2 | MTU 12V 396 TE94, 12 cyl | 2 | Northern Light, M844, 4 cyl 16 kW | 1 | 5-6 | 30% | 1 | 10 kW | 4570 | 100% | 3407.849 | 220 | 233 | 5205.493 | 0.4 | 0.1 | 1749045.712 | 127.5166 | 44.80314 |
| 33 | Mobility Primary Mission Area | | 1 | 200 | RHIB or MK V | 4 | 2 | Caterpillar 3126 Diesels | 2 | None | 0 | 1-2 | 600 | 2 | NA | 940 | 100% | 700.958 | 220 | 48 | 1070.714 | 0.1 | 0.0 | 1713142.617 | 124.8991 | 43.88346 |
| 34 | Escape and Evasion | | 1 | 84 | RHIBs | 2 | 2 | Caterpillar 3126 Diesels | 2 | None | 0 | 1-2 | 600 | 2 | NA | 940 | 100% | 700.958 | 220 | 48 | 1070.714 | 0.1 | 0.0 | 359759.9496 | 26.2288 | 9.215526 |
| | | | 1 | 84 | MK V | 2 | 2 | MTU 12V 396 TE94, 12 cyl | 2 | Northern Light, M844, 4 cyl 16 kW | 1 | 5-6 | 30% | 1 | 10 kW | 4570 | 100% | 3407.849 | 220 | 233 | 5205.493 | 0.4 | 0.1 | 1749045.712 | 127.5166 | 44.80314 |
| N9 | Underwater Demolition Qualification / Certification | | 1 | 12 | RHIBs or CRRC | 2 | 2 | Caterpillar 3126 Diesels | 2 | None | 0 | 1-2 | 600 | 2 | NA | 940 | 100% | 700.958 | 220 | 48 | 1070.714 | 0.1 | 0.0 | 51394.27851 | 3.746972 | 1.316504 |
| N10 | Vehicle Patrolling and Testing | | 1 | 50 | None | | | | | | | | | | | | | | | | | | | | | |
| N11 | NSW Demolition Traning: Demolition Requalifications and Training | | 1 | 12 | CRRCs | 4 | 2 | OMC Outboard, 55 hp (d) | 1 | None | 0 | 2 | 600-800 | 1 | NA | 55 | 100% | 41.0135 | 220 | 3 | 62.64817 | 0.0 | 0.0 | 6014.224081 | 0.438475 | 0.154059 |
| 2.2.3 | **Perform Tactical Reconnaissance and Surveillance** | | | | | | | | | | | | | | | | | | | | | | | | | |
| 35 | Helicopter Rope Suspension Training/Cast & Recovery Operation | | 1 | 154 | RHIBs | 1 | 2 | Caterpillar 3126 Diesels | 2 | None | 0 | 1-2 | 600 | 2 | NA | 940 | 100% | 700.958 | 220 | 48 | 1070.714 | 0.1 | 0.0 | 329779.9538 | 24.04307 | 8.447565 |
| | | | 1 | 154 | CRRCs | 2 | 2 | OMC Outboard, 55 hp (d) | 1 | None | 0 | 2 | 600-800 | 1 | NA | 55 | 100% | 41.0135 | 220 | 3 | 62.64817 | 0.0 | 0.0 | 38591.27119 | 2.813551 | 0.988545 |
| 36 | Rappel and Fast Rope Training | | 1 | 11 | None | | | | | | | | | | | | | | | | | | | | | |

| Scenario | Type Training | Reference | Days (a) | Operations (b) | Ship/Boat Type | Number | Ship Time on Range (hrs) (e) | Engines and Generators | | | | Ave. Speed (Knots) | Power Level (%) or horsepower | Engines on Line | Generator - Load (kW) | Ship hp | Ship Load Factor | kW | Fuel Use, g/kWh | Fuel Use, gallons/hr | Emissions Factors (lb/hr) (c) | | | Emissions, (lbs/year) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Hours | Propulsion | No. | Generator | No. | | | | | | | | | | CO2 | CH4 | N2O | CO2 | CH4 | N2O |
| 37 | SEAL Delivery Vehicle (SDV)/Advanced Seal Delivery System (AS | | 14 | 40 | RHIBs | 2 | 2 | Caterpillar 3126 Diesels | 2 | None | 0 | 1-2 | 600 | 2 | NA | 940 | 100% | 700.958 | 220 | 48 | 1070.714 | 0.1 | 0.0 | 2398399.664 | 174.8587 | 61.43684 |
| 4.5.6 | **Construct, Maintain, and Operate Logistics Over-the-Shore** | | | | | | | | | | | | | | | | | | | | | | | | | |
| 38 | OPDS | | 25 | 6 | OUBs | 2 | 4 | GM Detroit, V12-71N 460bhp | 2 | 3-71 GM Detroit, 40 kW | 2 | 10 | 2000 rpm (97%) | 2 | 2@ 7kW ea | 1840 | 100% | 1372.088 | 220 | 94 | 2095.866 | 0.2 | 0.1 | 2515039.161 | 183.3625 | 64.42465 |
| 39 | Amphibious Bulk Liquid Transfer System (ABLTS) | | 10 | 5 | Warping Tug | 1 | 4 | Foster Wheeler/ Babcock & Wilcox | 2 | NA - No separate emissions | 0 | 7 | 25% | 2 | NA | 4000 | 35% | 2982.8 | 246 | 228 | 5099.712 | 0.4 | 0.1 | 1019942.405 | 74.36033 | 26.1266 |
| | | | 10 | 5 | Barge Ferry | 2 | 4 | Foster Wheeler/ Babcock & Wilcox | 2 | NA - No separate emissions | 0 | 7 | 25% | 2 | NA | 4000 | 35% | 2982.8 | 246 | 228 | 5099.712 | 0.4 | 0.1 | 2039884.81 | 148.7207 | 52.25321 |
| 40 | Barge Ferry/Causeway Coxswain Training | | 3 | 54 | Barge Ferry | 2 | 4 | Foster Wheeler/ Babcock & Wilcox | 2 | NA - No separate emissions | 0 | 7 | 25% | 2 | NA | 4000 | 35% | 2982.8 | 246 | 228 | 5099.712 | 0.4 | 0.1 | 6609226.785 | 481.855 | 169.3004 |
| 41 | Causeway Pier Insertion and Retraction | | 5 | 10 | WTs | 4 | 4 | Foster Wheeler/ Babcock & Wilcox | 2 | NA - No separate emissions | 0 | 7 | 25% | 2 | NA | 4000 | 35% | 2982.8 | 246 | 228 | 5099.712 | 0.4 | 0.1 | 4079769.62 | 297.4413 | 104.5064 |
| 42 | Elevated Causeway System (ELCAS) | | 10 | 4 | WTs | 2 | 4 | Foster Wheeler/ Babcock & Wilcox | 2 | NA - No separate emissions | 0 | 7 | 25% | 2 | NA | 4000 | 35% | 2982.8 | 246 | 228 | 5099.712 | 0.4 | 0.1 | 1631907.848 | 118.9765 | 41.80257 |
| | | | 10 | 4 | Personal Watercraft | 2 | 4 | Yamaha Outboard, 160 hp (d) | 1 | None | 0 | 2 | 100% | 1 | NA | 160 | 100% | 119.312 | 220 | 8 | 182.2492 | 0.0 | 0.0 | 58319.74866 | 4.251883 | 1.493905 |
| | | | 10 | 4 | LCM | 1 | 4 | GM Detroit, V12-71N 460bhp | 2 | 3-71 GM Detroit, 40 kW | 2 | 10 | 2000 rpm (97%) | 2 | 2@ 7kW ea | 1840 | 100% | 1372.088 | 220 | 94 | 2095.866 | 0.2 | 0.1 | 335338.5548 | 24.44833 | 8.589953 |
| 43 | Establish Beach Party Command Post | | 4 | 16 | None | | | | | | | | | | | | | | | | | | | | | |
| 44 | Sterngate Marriage to Amphibious Ship/LCU | | 1 | 40 | LCU | 2 | 4 | GM Detroit, V12-71N 460bhp | 2 | 3-71 GM Detroit, 40 kW | 2 | 10 | 2000 rpm (97%) | 2 | 2@ 7kW ea | 1840 | 100% | 1372.088 | 220 | 94 | 2095.866 | 0.2 | 0.1 | 670677.1096 | 48.89666 | 17.17991 |
| 45 | LCU/LCM Beaching | | 1 | 60 | LCU | 1 | 4 | GM Detroit, V12-71N 460bhp | 2 | 3-71 GM Detroit, 40 kW | 2 | 10 | 2000 rpm (97%) | 2 | 2@ 7kW ea | 1840 | 100% | 1372.088 | 220 | 94 | 2095.866 | 0.2 | 0.1 | 503007.8322 | 36.67249 | 12.88493 |
| | | | 1 | 60 | LCM-8 | 1 | 4 | GM Detroit, V12-71N 460bhp | 2 | 3-71 GM Detroit, 40 kW | 2 | 10 | 2000 rpm (97%) | 2 | 2@ 7kW ea | 1840 | 100% | 1372.088 | 220 | 94 | 2095.866 | 0.2 | 0.1 | 503007.8322 | 36.67249 | 12.88493 |
| 46 | LCU/LCM Towing/Being Towed | | 1 | 60 | LCU | 2 | 4 | GM Detroit, V12-71N 460bhp | 2 | 3-71 GM Detroit, 40 kW | 2 | 10 | 2000 rpm (97%) | 2 | 2@ 7kW ea | 1840 | 100% | 1372.088 | 220 | 94 | 2095.866 | 0.2 | 0.1 | 1006015.664 | 73.34498 | 25.76986 |
| | | | 1 | 60 | LCM-8 | 2 | 4 | GM Detroit, V12-71N 460bhp | 2 | 3-71 GM Detroit, 40 kW | 2 | 10 | 2000 rpm (97%) | 2 | 2@ 7kW ea | 1840 | 100% | 1372.088 | 220 | 94 | 2095.866 | 0.2 | 0.1 | 1006015.664 | 73.34498 | 25.76986 |
| 47 | Communications Training | | 2 | 2 | None | | | | | | | | | | | | | | | | | | | | | |
| 48 | Field Training Exercise with a Beach Camp | | 14 | 2 | None | | | | | | | | | | | | | | | | | | | | | |
| 49 | Maritime Pre-positioning Ships (MPS) Offload | | 5 | 2 | LCM-8 | 2 | 2 | GM Detroit, V12-71N 460bhp | 2 | 3-71 GM Detroit, 40 kW | 2 | 10 | 2000 rpm (97%) | 2 | 2@ 7kW ea | 920 | 100% | 686.044 | 220 | 47 | 1047.933 | 0.1 | 0.0 | 41917.31935 | 3.056041 | 1.073744 |
| | | | 5 | 2 | WTs | 2 | 2 | Foster Wheeler/ Babcock & Wilcox | 2 | NA - No separate emissions | 0 | 7 | 25% | 2 | NA | 4000 | 35% | 2982.8 | 246 | 228 | 5099.712 | 0.4 | 0.1 | 203988.481 | 14.87207 | 5.225321 |
| | | | 5 | 2 | Barge Ferry | 2 | 2 | Foster Wheeler/ Babcock & Wilcox | 2 | NA - No separate emissions | 0 | 7 | 25% | 2 | NA | 4000 | 35% | 2982.8 | 246 | 228 | 5099.712 | 0.4 | 0.1 | 203988.481 | 14.87207 | 5.225321 |
| 50 | Reverse Osmosis Water Purification Unit | | 4 | 4 | None | | | | | | | | | | | 4000 | | | | | | | | | | |
| 51 | Roll-on/Roll-off Discharge Facility | | 5 | 2 | WTs | 2 | 2 | Foster Wheeler/ Babcock & Wilcox | 2 | NA - No separate emissions | 0 | 7 | 25% | 2 | NA | 4000 | 35% | 2982.8 | 246 | 228 | 5099.712 | 0.4 | 0.1 | 203988.481 | 14.87207 | 5.225321 |
| | | | 5 | 2 | Personal Watercraft | 2 | 2 | Yamaha Outboard, 160 hp (d) | 1 | None | 0 | 2 | 100% | 1 | NA | 160 | 100% | 119.312 | 220 | 8 | 182.2492 | 0.0 | 0.0 | 7289.968583 | 0.531485 | 0.186738 |
| 52 | MPF Utility Boat Operator Course | | 9 | 2 | MPF Utility Boat | 2 | 4 | Diesel Engines | 2 | None | 0 | 2 | 660 | 2 | NA | 1320 | 100% | 984.324 | 220 | 67 | 1503.556 | 0.1 | 0.0 | 216512.0669 | 15.78512 | 5.546122 |
| 53 | LARC V Operator Training | | 6 | 1 | None | | | | | | | | | | | | | | | | | | | | | |
| 4.9.1 | **Conduct Mission Area Training** | | | | | | | | | | | | | | | | | | | | | | | | | |
| | **NSW Diving and Beach Operations** | | | | | | | | | | | | | | | | | | | | | | | | | |
| 54 | Lung Automatic Rebreather (LAR) V Closed Circuit Breathing Divi | | 1 | 126 | RHIBs | 5 | 2 | Caterpillar 3126 Diesels | 2 | None | 0 | 1-2 | 600 | 2 | NA | 940 | 100% | 700.958 | 220 | 48 | 1070.714 | 0.1 | 0.0 | 1349099.811 | 98.35802 | 34.55822 |
| 55 | Open Circuit Breathing Diving | | 1 | 12 | RHIBs | 5 | 2 | Caterpillar 3126 Diesels | 2 | None | 0 | 1-2 | 600 | 2 | NA | 940 | 100% | 700.958 | 220 | 48 | 1070.714 | 0.1 | 0.0 | 128485.6963 | 9.36743 | 3.291259 |
| | | | | | LCU | 1 | | | | | | | | | | | | | | | | | | | | |
| 56 | OTB Field Training Exercise | | 5 | 36 | CRRCs | 5 | 2 | assume paddling | | | | | | | | | | | | | | | | | | |
| 57 | Rock Portage | | 1 | 20 | CRRCs | 7 | 2 | assume paddling | | | | | | | | | | | | | | | | | | |
| | | | 1 | 20 | IBS | 9 | 2 | OMC Outboard, 55 hp (d) | 1 | None | 0 | 2 | 600-800 | 1 | NA | 55 | 100% | 41.0135 | 220 | 3 | 62.64817 | 0.0 | 0.0 | 22553.3403 | 1.644283 | 0.577721 |
| | **NSW Land Warfare** | | | | | | | | | | | | | | | | | | | | | | | | | |
| 58 | Land Patrolling | | 1 | 18 | None | | | | | | | | | | | | | | | | | | | | | |
| 59 | Immediate Action Drills | | 1 | 6 | None | | | | | | | | | | | | | | | | | | | | | |
| | **NSW Advanced Training** | | | | | | | | | | | | | | | | | | | | | | | | | |
| 60 | Over the Beach Insertion / Photo Reconnaissance | | 1 | 31 | RHIB/CRRC | 1 | 2 | Caterpillar 3126 Diesels | 2 | None | 0 | 1-2 | 600 | 2 | NA | 940 | 100% | 700.958 | 220 | 48 | 1070.714 | 0.1 | 0.0 | 66384.27641 | 4.839839 | 1.700484 |
| | | | 1 | 31 | Kayak | 1 | 2 | assume paddling | | | | | | | | | | | | | | | | | | |
| 61 | Photo Image Capture | | 14 | 4 | None | | | | | | | | | | | | | | | | | | | | | |
| 62 | Field Skills (Observation Drill, Sketching, Range Estimation) | | 1 | 24 | None | | | | | | | | | | | | | | | | | | | | | |
| 63 | Stalking, Movement and Hide-Sites | | 5 | 8 | None | | | | | | | | | | | | | | | | | | | | | |
| 64 | CQC/CQD | | 1 | 198 | CRRCs | 5 | 2 | OMC Outboard, 55 hp (d) | 1 | None | 0 | 2 | 600-800 | 1 | NA | 55 | 100% | 41.0135 | 220 | 3 | 62.64817 | 0.0 | 0.0 | 124043.3717 | 9.043556 | 3.177466 |
| 65 | Communications | | 5 | 6 | None | | | | | | | | | | | | | | | | | | | | | |
| 66 | Unmanned Aerial Vehicle (UAV) Training | | 5 | 12 | None | | | | | | | | | | | | | | | | | | | | | |
| 67 | Around the World Training | | 1 | 6 | CRRCs | 7 | 2 | assume paddling | | | | | | | | | | | | | | | | | | |
| | | | 1 | 6 | Sea Kayaks | 5 | 2 | assume paddling | | | | | | | | | | | | | | | | | | |

| Scenario | Type Training | Reference | Days (a) | Operations (b) | Ship/Boat Type | Number | Ship Time on Range (hrs) (e) | Engines and Generators | | | | Ave. Speed (Knots) | Power Level (%) or horsepower | Engines on Line | Generator - Load (kW) | Ship hp | Ship Load Factor | kW | Fuel Use, g/kWh | Fuel Use, gallons/hr | Emissions Factors (lb/hr) (c) | | | Emissions, (lbs/year) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Hours | Propulsion | No. | Generator | No. | | | | | | | | | | CO2 | CH4 | N2O | CO2 | CH4 | N2O |
| 4.9.4 | **Provide/Execute Training for U.S. and Other Nation Units and** | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0 | **NSW Physical Fitness Training** | | | | | | | | | | | | | | | | | | | | | | | | | |
| 68 | Physical Training Runs | | 1 | 464 | None | | | | | | | | | | | | | | | | | | | | | |
| 69 | Physical Conditioning Training Exercise | | 1 | 280 | CRRCs / Propeller Surface Craft | 3 | 2 | assume paddling | | | | | | | | | | | | | | | | | | |
| 70 | Swim Training | | 1 | 172 | RHIBs | 5 | 2 | assume paddling | | | | | | | | | | | | | | | | | | |
| 71 | Hell Week | | 5 | 6 | CRRCs | 5 | 2 | OMC Outboard, 55 hp (d) | 1 | None | 0 | 2 | 600-800 | 1 | NA | 55 | 100% | 41.0135 | 220 | 3 | 62.64817 | 0.0 | 0.0 | 18794.45025 | 1.370236 | 0.481434 |
| 72 | Rucksack March | | 1 | 54 | None | | | | | | | | | | | | | | | | | | | | | |
| 73 | Monster Mash | | 1 | 6 | CRRCs | 3 | 2 | OMC Outboard, 55 hp (d) | 1 | None | 0 | 2 | 600-800 | 1 | NA | 55 | 100% | 41.0135 | 220 | 3 | 62.64817 | 0.0 | 0.0 | 2255.33403 | 0.164428 | 0.057772 |
| 4.12.6 | **Provide Industrial and Environmental Health Services** | | | | | | | | | | | | | | | | | | | | | | | | | |
| 74 | Conduct Environmental Health Site Assessment | | 3 | 3 | None | | | | | | | | | | | | | | | | | | | | | |
| 6.1.1 | **Conduct Explosive Ordnance Disposal** | | | | | | | | | | | | | | | | | | | | | | | | | |
| 75 | Conventional Ordnance/Improvised Explosive Device Response | | 1 | 120 | None | | | | | | | | | | | | | | | | | | | | | |
| 76 | Land Mine Detection/Neutralization | | 1 | 45 | None | | | | | | | | | | | | | | | | | | | | | |
| 6.3.1 | **Force Protection: Protect and Secure Area of Operations** | | | | | | | | | | | | | | | | | | | | | | | | | |
| 77 | Field Training Exercise (FTX) e.g. SEAHAWK | | 14 | 53 | Boston Whalers | 144 | 2 | OMC Johnson Outboards (d) | 2 | None | 0 | 2-3 | 1000 | 2 | NA | 60 | 100% | 44.742 | 220 | 3 | 68.34346 | 0.0 | 0.0 | 14604723.06 | 1064.778 | 374.1111 |
| 6.3.3 | **Combat Terrorism** | | | | | | | | | | | | | | | | | | | | | | | | | |
| 78 | Small Boat Attack | | 1 | 36 | Boston Whalers | 1 | 2 | OMC Johnson Outboards (d) | 2 | None | 0 | 2-3 | 1000 | 2 | NA | 60 | 100% | 44.742 | 220 | 3 | 68.34346 | 0.0 | 0.0 | 4920.728793 | 0.358753 | 0.126048 |
| | | | 1 | 36 | surface vessel dropping anchor and 3 sh | 1 | 2 | | | | | | | | | | | | | | | | | | | |
| | | | 1 | 36 | 18' Bayliner | 1 | 2 | OMC Johnson Outboards (d) | 2 | None | 0 | 2-3 | 1000 | 2 | NA | 60 | 100% | 44.742 | 220 | 3 | 68.34346 | 0.0 | 0.0 | 4920.728793 | 0.358753 | 0.126048 |
| | | | | | | | | | | | | | | | | | | | | | | | | 166110282.3 | 12110.503 | 4255.0417 |
| | | | | | | | | | | | | | | | | | | | | | **Emissions, short tons/year** | | | 83055.14 | 6.06 | 2.13 |

Assume marine vessels participate for one day during Amphibious Raid Operations and Direct Action Operations and Seahawk
Assumptions: Watercraft operates 8 hours per day for the days during which the operation occurs

Table C-17
Ground Vehicle GHG Emissions
Alternatives 1 and 2

| Scenario | Type Training | Reference | Days (a) | Operations (b) | Ground Vehicles | Number | Engine Load | Hours per day | Horsepower | Emissions Factors (lb/hr) | | | Emissions (lbs) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | CO2 | CH4 | N2O | CO2 | CH4 | N2O |
| **1.1.2** | **Conduct Maneuver - Move Forces** | | | | | | | | | | | | | | |
| 1 | Anchoring | | 1 | 72 | None | | | | | | | | | | |
| 2 | Towing | | 1 | 30 | None | | | | | | | | | | |
| 3 | Moor to Buoy | | 1 | 36 | None | | | | | | | | | | |
| **1.3.1** | **Perform Mine Countermeasures** | | | | | | | | | | | | | | |
| 4 | Parachute Operations | | 1 | 228 | 4WD Pickups | 2 | | 2 | | 22.71 | 0.00 | 0.00 | 20714 | 1.72 | 1.46 |
| 5 | MCM Operations | | 1 | 58 | 4WD Pickups | 2 | | 2 | | 22.71 | 0.00 | 0.00 | 5269 | 0.44 | 0.37 |
| 6 | Floating Mine Operations | | 1 | 53 | 4WD Pickups | 1 | | 2 | | 22.71 | 0.00 | 0.00 | 2408 | 0.20 | 0.17 |
| 7 | Dive Platoon | | 1 | 8 | None | | | | | | | | | | |
| 8 | Very Shallow Water (VSW) Operator Course | | 8 | 6 | None | | | | | | | | | | |
| 9 | VSW Mine Countermeasure Operations | | 1 | 156 | None | | | | | | | | | | |
| 10 | Autonomous Underwater Vehicle (AUV) Operations/UUV Operations | | 1 | 156 | None | | | | | | | | | | |
| 11 | MK8 Marine Mammal/MMS Operations | | 1 | 208 | 4WD Pickups | 0 | | 2 | | 22.71 | 0.00 | 0.00 | 0 | 0.00 | 0.00 |
| 12 | Mine Neutralization | | 1 | 4 | 4WD Pickups | 2 | | 2 | | 22.71 | 0.00 | 0.00 | 363 | 0.03 | 0.03 |
| N1 | Shock Wave Generator | | 1 | 90 | 4WD Pickups | 1 | | 2 | | 22.71 | 0.00 | 0.00 | 4088 | 0.34 | 0.29 |
| N2 | Surf Zone Test Detachment/Equipment T&E | | 1 | 200 | 4WD Pickups | 1 | | 2 | | 22.71 | 0.00 | 0.00 | 9085 | 0.75 | 0.64 |
| N3 | UUV Neutralization | | 1 | 4 | 4WD Pickups | 2 | | 2 | | 22.71 | 0.00 | 0.00 | 363 | 0.03 | 0.03 |
| N4 | Mine Hunting | | 1 | 200 | None | | | | | | | | | | |
| N5 | Airborne Laser Mine Detection | | 1 | 48 | None | | | | | | | | | | |
| N6 | Organic Airborne Surface Influence Sweep | | 1 | 100 | None | | | | | | | | | | |
| N7 | Airborne Mine Neutralization | | 1 | 48 | None | | | | | | | | | | |
| **1.4.6** | **Conduct Maritime Interception** | | | | | | | | | | | | | | |
| 13 | Visit, Board, Search and Seizure | | 1 | 42 | None | | | | | | | | | | |
| **1.5.4** | **Conduct Amphibious Operations** | | | | | | | | | | | | | | |
| 14 | Small Boat Handling | | 1 | 94 | HMMWV | 1 | 65% | 3 | 150 | 1.25 | 0.00 | 0.00 | 34448 | 3.82 | 0.00 |
| 15 | Swimmer Conditioning - Bay and Ocean with fins | | 1 | 189 | HMMWV | 1 | 65% | 3 | 150 | 1.25 | 0.00 | 0.00 | 69263 | 7.68 | 0.00 |
| | | | 1 | 189 | Truck | 1 | 80% | 1 | | 48.21 | 0.00 | 0.03 | 7289 | 0.20 | 4.28 |
| 16 | Basic Reconnaissance Course Final Mission | | 1 | 8 | None | | | | | | | | | | |
| 17 | Obstacle Course | | 1 | 142 | 4WD Pickups | 2 | | 2 | | 22.71 | 0.00 | 0.00 | 12901 | 1.07 | 0.91 |
| 18 | Hydrographic Reconnaissance | | 1 | 44 | 4WD Pickups | 3 | | 2 | | 22.71 | 0.00 | 0.00 | 5996 | 0.50 | 0.42 |
| 19 | Surf Observations (SUROBS) | | 1 | 116 | 4WD Pickups | 2 | | 2 | | 22.71 | 0.00 | 0.00 | 10539 | 0.87 | 0.74 |
| 20 | CRRC Inflatable Boat Small (IBS)/Surf Passage/Boat Team Organization and Function | | 1 | 72 | HMMWV/ 4WD Pickups | 2 | 65% | 3 | 150 | 1.25 | 0.00 | 0.00 | 52772 | 5.85 | 0.00 |
| 21 | CRRC Towing and High Speed Maneuver | | 1 | 8 | 4WD Pickups / HMMWV | 1 | | 2 | | 22.71 | 0.00 | 0.00 | 363 | 0.03 | 0.03 |
| 22 | CRRC Bay Landing Craft Utility (LCU) Launch and Recover - Bay and Ocean | | 1 | 24 | 4WD Pickups / HMMWV | 1 | | 2 | | 22.71 | 0.00 | 0.00 | 1090 | 0.09 | 0.08 |
| 23 | CRRC Navigation, Bay and Ocean Runs | | 1 | 26 | 4WD Pickups / HMMWV | 1 | | 8 | | 22.71 | 0.00 | 0.00 | 4724 | 0.39 | 0.33 |
| 24 | Amphibious Raid Course Final Mission | | 1 | 24 | None | 0 | | | | | | | | | |
| 25 | Amphibious Raid Operations | | 3 | 18 | HMMWVs | 6 | 65% | 3 | 150 | 1.25 | 0.00 | 0.00 | 118737 | 13.16 | 0.00 |
| | | | 3 | 18 | 4WD Pickups | 8 | | 8 | | 22.71 | 0.00 | 0.00 | 78496 | 6.51 | 5.55 |
| | | | 3 | 18 | AAVs | 6 | | 2 | | 180.277 | 0.0 | 0.0 | 116819 | 8.52 | 2.99 |
| | | | 3 | 18 | LAVs | 6 | 65% | 2 | 150 | 1.25 | 0.00 | 0.00 | 79158 | 8.78 | 0.00 |
| | | | 3 | 18 | IFAVs | 6 | 65% | 2 | 150 | 1.25 | 0.00 | 0.00 | 79158 | 8.78 | 0.00 |
| 26 | Direct Action (DA) Operations | | 3 | 18 | Light Wheeled Vehicles | 16 | | 2 | | 22.71 | 0.00 | 0.00 | 39248 | 3.26 | 2.77 |
| 27 | Craft Landing Zone (CLZ) | | 1 | 4 | HMMWVs | 1 | 65% | 3 | 150 | 1.25 | 0.00 | 0.00 | 1466 | 0.16 | 0.00 |
| N8 | Tactical Recovery of Aircraft and Personnel | | 1 | 4 | 4WD Pickups | 9 | | 2 | | 22.71 | 0.00 | 0.00 | 1635 | 0.14 | 0.12 |
| **1.5.7** | **Conduct Naval Special Warfare** | | | | | | | | | | | | | | |
| 28 | Swimmer/Combat Rubber Raiding Craft Over-the-Beach | | 4 | 86 | 4WD Pickups | 3 | | 2 | | 22.71 | 0.00 | 0.00 | 46880 | 3.89 | 3.31 |
| 29 | Over-the-Beach Stalk | | 1 | 24 | 4WD Pickups | 1 | | 2 | | 22.71 | 0.00 | 0.00 | 1090 | 0.09 | 0.08 |
| 30 | Immediate Action Drills | | 1 | 12 | 4WD Pickups | 4 | | 2 | | 22.71 | 0.00 | 0.00 | 2180 | 0.18 | 0.15 |
| 31 | Breacher Training | | 1 | 20 | 4WD Pickups | 3 | | 2 | | 22.71 | 0.00 | 0.00 | 2726 | 0.23 | 0.19 |
| 32 | Amphibious Warfare Exercise | | 1 | 84 | None | 0 | | | | | | | | | |
| 33 | Mobility Primary Mission Area | | 1 | 200 | None | 0 | | | | | | | | | |
| 34 | Escape and Evasion | | 1 | 84 | None | 0 | | | | | | | | | |
| N9 | Underwater Demolition Qualification / Certification | | 1 | 12 | 4WD Pickups | 2 | | 2 | | 22.71 | 0.00 | 0.00 | 1090 | 0.09 | 0.08 |
| N10 | Vehicle Patrolling and Testing | | 1 | 50 | HMMVS | 6 | 65% | 3 | 150 | 1.25 | 0.00 | 0.00 | 109941 | 12.19 | 0.00 |
| N11 | NSW Demolition Traning: Demolition Requalifications and Training (Underwater Detonations) | | 1 | 12 | 4WD Pickups | 1 | | 2 | | 22.71 | 0.00 | 0.00 | 545 | 0.05 | 0.04 |
| **2.2.3** | **Perform Tactical Reconnaissance and Surveillance** | | | | | | | | | | | | | | |
| 35 | Helicopter Rope Suspension Training/Cast & Recovery Operation | | 1 | 154 | 4WD Pickups | 2 | | 2 | | 22.71 | 0.00 | 0.00 | 13991 | 1.16 | 0.99 |
| 36 | Rappel and Fast Rope Training | | 1 | 11 | 4WD Pickups | 4 | | 2 | | 22.71 | 0.00 | 0.00 | 1999 | 0.17 | 0.14 |
| 37 | SEAL Delivery Vehicle (SDV)/Advanced Seal Delivery System (ASDS) Certification to Deploy | | 14 | 40 | 4WD Pickups | 2 | | 2 | | 22.71 | 0.00 | 0.00 | 50877 | 4.22 | 3.60 |
| **4.5.6** | **Construct, Maintain, and Operate Logistics Over-the-Shore** | | | | | | | | | | | | | | |
| 38 | OPDS | | 25 | 6 | HMMWVs | 1 | 65% | 3 | 150 | 1.25 | 0.00 | 0.00 | 54971 | 6.09 | 0.00 |
| | | | 25 | 6 | 5-ton truck | 1 | 80% | 1 | | 48.21 | 0.00 | 0.03 | 5785 | 0.15 | 3.40 |
| | | | 25 | 6 | Dozer | 2 | 59% | 8 | 240.0 | 1.25 | 0.00 | 0.00 | 425783 | 47.20 | 0.00 |
| | | | 25 | 6 | Comm Van | 1 | | 8 | | 22.71 | 0.00 | 0.00 | 27256 | 2.26 | 1.93 |
| | | | 25 | 6 | RTV forklift | 1 | 48% | 8 | 93.0 | 1.25 | 0.00 | 0.00 | 66416 | 7.36 | 0.00 |
| | | | 25 | 6 | LARCV | 2 | | 2 | 350.0 | 10.85 | 2.338 | 0.879935 | 6510 | 1402.80 | 527.96 |
| 39 | Amphibious Bulk Liquid Transfer System (ABLTS) | | 10 | 5 | HMMWVs | 1 | 65% | 3 | 150 | 1.25 | 0.00 | 0.00 | 18324 | 2.03 | 0.00 |
| | | | 10 | 5 | 5-ton truck | 1 | 80% | 1 | | 48.21 | 0.00 | 0.03 | 1928 | 0.05 | 1.13 |
| | | | 10 | 5 | Van | 1 | | 8 | | 22.71 | 0.00 | 0.00 | 9085 | 0.75 | 0.64 |
| | | | 10 | 5 | Dozers | 2 | 59% | 8 | 240.0 | 1.25 | 0.00 | 0.00 | 141928 | 15.73 | 0.00 |
| | | | 10 | 5 | Rough Terrain Forklift | 1 | 48% | 8 | 37.0 | 1.25 | 0.00 | 0.00 | 8901 | 0.99 | 0.00 |
| | | | 10 | 5 | LARCV | 2 | | 2 | 350.0 | 10.85 | 2.338 | 0.879935 | 2170 | 467.60 | 175.99 |
| 40 | Barge Ferry/Causeway Coxswain Training | | 3 | 54 | HMMWVs | 1 | 65% | 3 | 150 | 1.25 | 0.00 | 0.00 | 59368 | 6.58 | 0.00 |
| | | | 3 | 54 | 5-ton truck | 1 | 80% | 1 | | 48.21 | 0.00 | 0.03 | 6247 | 0.17 | 3.67 |
| | | | 3 | 54 | Van | 1 | | 8 | | 22.71 | 0.00 | 0.00 | 29436 | 2.44 | 2.08 |

| Scenario | Type Training | Reference | Days (a) | Operations (b) | Ground Vehicles | Number | Engine Load | Hours per day | Horsepower | Emissions Factors (lb/hr) CO2 | CH4 | N2O | Emissions (lbs) CO2 | CH4 | N2O |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 3 | 54 | Dozer | 2 | 59% | 8 | 240.0 | 1.25 | 0.00 | 0.00 | 459846 | 50.98 | 0.00 |
| | | | 3 | 54 | LARCV | 2 | | 2 | 350.0 | 10.85 | 2.338 | 0.879935 | 7031 | 1515.02 | 570.20 |
| 41 | Causeway Pier Insertion and Retraction | | 5 | 10 | HMMWVs | 2 | 65% | 3 | 150 | 1.25 | 0.00 | 0.00 | 36647 | 4.06 | 0.00 |
| | | | 5 | 10 | 5-ton truck | 1 | 80% | 1 | | 48.21 | 0.00 | 0.03 | 1928 | 0.05 | 1.13 |
| | | | 5 | 10 | Van | 1 | | 8 | | 22.71 | 0.00 | 0.00 | 9085 | 0.75 | 0.64 |
| | | | 5 | 10 | Rough Terrain Forklift | 1 | 48% | 8 | 37.0 | 1.25 | 0.00 | 0.00 | 8901 | 0.99 | 0.00 |
| | | | 5 | 10 | Dozers | 2 | 59% | 8 | 240.0 | 1.25 | 0.00 | 0.00 | 141928 | 15.73 | 0.00 |
| | | | 5 | 10 | LARCV | 2 | | 2 | 350.0 | 10.85 | 2.338 | 0.879935 | 2170 | 467.60 | 175.99 |
| 42 | Elevated Causeway System (ELCAS) | | 10 | 4 | HMMWVs | 4 | 65% | 3 | 150 | 1.25 | 0.00 | 0.00 | 58635 | 6.50 | 0.00 |
| | | | 10 | 4 | 5-ton truck | 3 | 80% | 1 | | 48.21 | 0.00 | 0.03 | 4628 | 0.12 | 2.72 |
| | | | 10 | 4 | Light Trucks | 4 | 62% | 8 | 161.0 | 1.25 | 0.00 | 0.00 | 160082 | 17.75 | 0.00 |
| | | | 10 | 4 | Dozers | 2 | 59% | 8 | 240.0 | 1.25 | 0.00 | 0.00 | 113542 | 12.59 | 0.00 |
| | | | 10 | 4 | Forklifts | 1 | 48% | 8 | 37.0 | 1.25 | 0.00 | 0.00 | 7120 | 0.79 | 0.00 |
| | | | 10 | 4 | 75-Ton Crane | 2 | 74% | 8 | 194.0 | 1.25 | 0.00 | 0.00 | 115114 | 12.76 | 0.00 |
| | | | 10 | 4 | Pile Driver | 2 | 30% | 24 | 20.0 | 1.25 | 0.00 | 0.00 | 14433 | 1.60 | 0.00 |
| | | | 10 | 4 | ambulance | 1 | | 8 | | 22.71 | 0.00 | 0.00 | 7268 | 0.60 | 0.51 |
| | | | 10 | 4 | water buffalo | 1 | 80% | 1 | | 48.21 | 0.00 | 0.03 | 1543 | 0.04 | 0.91 |
| | | | 10 | 4 | 140-ton crane | 1 | 74% | 8 | 399.0 | 1.25 | 0.00 | 0.00 | 118377 | 13.12 | 0.00 |
| | | | 10 | 4 | 30-ton crane | 2 | 74% | 8 | 194.0 | 1.25 | 0.00 | 0.00 | 115114 | 12.76 | 0.00 |
| | | | 10 | 4 | LARCV | 2 | | 2 | 350.0 | 10.85 | 2.338 | 0.879935 | 1736 | 374.08 | 140.79 |
| | | | 10 | 4 | Air compressors | 2 | 48% | 8 | 106.0 | 1.25 | 0.00 | 0.00 | 40798 | 4.52 | 0.00 |
| | | | 10 | 4 | Pile Extractor | 1 | 30% | 24 | 20.0 | 1.25 | 0.00 | 0.00 | 7217 | 0.80 | 0.00 |
| 43 | Establish Beach Party Command Post | | 4 | 16 | HMMWVs | 3 | 65% | 3 | 150 | 1.25 | 0.00 | 0.00 | 70363 | 7.80 | 0.00 |
| | | | 4 | 16 | 5-ton truck | 1 | 80% | 1 | | 48.21 | 0.00 | 0.03 | 2468 | 0.07 | 1.45 |
| | | | 4 | 16 | Dozer | 1 | 59% | 8 | 240.0 | 1.25 | 0.00 | 0.00 | 90834 | 10.07 | 0.00 |
| | | | 4 | 16 | Generators/various | 2 | 30% | 24 | Various | 2064.95 | 0.00 | 5.28 | 951529 | 0.00 | 2433.02 |
| | | | 4 | 16 | Heaters | 2 | 51% | 8 | 238.0 | 1.25 | 0.00 | 0.00 | 155726 | 17.26 | 0.00 |
| | | | 4 | 16 | LARCV | 2 | | 2 | 350.0 | 10.85 | 2.338 | 0.879935 | 2778 | 598.53 | 225.26 |
| 44 | Sterngate Marriage to Amphibious Ship/LCU | | 1 | 40 | None | 0 | | | | | | | | | |
| 45 | LCU/LCM Beaching | | 1 | 60 | HMMWVs | 1 | 65% | 3 | 150 | 1.25 | 0.00 | 0.00 | 21988 | 2.44 | 0.00 |
| | | | 1 | 60 | 5-ton truck | 1 | 80% | 1 | | 48.21 | 0.00 | 0.03 | 2314 | 0.06 | 1.36 |
| | | | 1 | 60 | Dozer | 1 | 59% | 8 | 240.0 | 1.25 | 0.00 | 0.00 | 85157 | 9.44 | 0.00 |
| | | | 1 | 60 | LARCV | 1 | | 2 | 350.0 | 10.85 | 2.338 | 0.879935 | 1302 | 280.56 | 105.59 |
| 46 | LCU/LCM Towing/Being Towed | | 1 | 60 | Dozer | 1 | 59% | 8 | 240.0 | 1.25 | 0.00 | 0.00 | 85157 | 9.44 | 0.00 |
| 47 | Communications Training | | 2 | 2 | 4WD Pickups | 4 | | 2 | | 22.71 | 0.00 | 0.00 | 727 | 0.06 | 0.05 |
| | | | 2 | 2 | RTVs | 4 | 48% | 8 | 93.0 | 1.25 | 0.00 | 0.00 | 7084 | 0.79 | 0.00 |
| | | | 2 | 2 | Bus | 2 | | 2 | | 89.15 | 0.00 | 0.07 | 1426 | 0.03 | 1.13 |
| | | | 2 | 2 | Tractor with flat bed | 1 | 80% | 1 | | 48.21 | 0.00 | 0.03 | 154 | 0.00 | 0.09 |
| 48 | Field Training Exercise with a Beach Camp | | 14 | 2 | HMMWVs | 2 | 65% | 3 | 150 | 1.25 | 0.00 | 0.00 | 20522 | 2.28 | 0.00 |
| | | | 14 | 2 | 5-ton truck | 1 | 80% | 1 | | 48.21 | 0.00 | 0.03 | 1080 | 0.03 | 0.63 |
| | | | 14 | 2 | Dozer | 2 | 59% | 8 | 240.0 | 1.25 | 0.00 | 0.00 | 79480 | 8.81 | 0.00 |
| | | | 14 | 2 | 4WD Pickups | 10 | | 2 | | 22.71 | 0.00 | 0.00 | 12719 | 1.06 | 0.90 |
| | | | 14 | 2 | Fuel Truck | 1 | | 2 | | 22.71 | 0.00 | 0.00 | 1272 | 0.11 | 0.09 |
| | | | 14 | 2 | 20-ton Stake Trucks | 1 | | 2 | | 1.25 | 0.00 | 0.00 | 0 | 0.00 | 0.00 |
| | | | 14 | 2 | 50-ton Low-bed Trucks | 1 | | 2 | | 1.25 | 0.00 | 0.00 | 0 | 0.00 | 0.00 |
| | | | 14 | 2 | Wheeled Loaders | 2 | 47% | 8 | 147.0 | 1.25 | 0.00 | 0.00 | 38367 | 4.25 | 0.00 |
| | | | 14 | 2 | Generators/various | 23 | 30% | 24 | Various | 2064.95 | 0.00 | 5.28 | 416294 | 0.00 | 1064.45 |
| | | | 14 | 2 | Heaters | 117 | 51% | 8 | 238.0 | 1.25 | 0.00 | 0.00 | 3985614 | 441.83 | 0.00 |
| | | | 14 | 2 | Welder | 6 | 45% | 8 | 45.0 | 1.25 | 0.00 | 0.00 | 34099 | 3.78 | 0.00 |
| | | | 14 | 2 | LARCV | 2 | | 2 | 350.0 | 10.85 | 2.338 | 0.879935 | 1215 | 261.86 | 98.55 |
| 49 | Maritime Pre-positioning Ships (MPS) Offload | | 5 | 2 | HMMWVs | 2 | 65% | 3 | 150 | 1.25 | 0.00 | 0.00 | 7329 | 0.81 | 0.00 |
| | | | 5 | 2 | 5-ton truck | 1 | 80% | 1 | | 48.21 | 0.00 | 0.03 | 386 | 0.01 | 0.23 |
| | | | 5 | 2 | Dozer | 1 | 59% | 8 | 240.0 | 1.25 | 0.00 | 0.00 | 14193 | 1.57 | 0.00 |
| | | | 5 | 2 | 4WD Pickups | 3 | | 2 | | 22.71 | 0.00 | 0.00 | 1363 | 0.11 | 0.10 |
| | | | 5 | 2 | LARCV | 1 | | 2 | 350.0 | 10.85 | 2.338 | 0.879935 | 217 | 46.76 | 17.60 |
| 50 | Reverse Osmosis Water Purification Unit | | 4 | 4 | 4WD Pickups | 2 | | 2 | | 22.71 | 0.00 | 0.00 | 1454 | 0.12 | 0.10 |
| | | | 4 | 4 | RTVs | 6 | 48% | 8 | 93.0 | 1.25 | 0.00 | 0.00 | 42506 | 4.71 | 0.00 |
| | | | 4 | 4 | Generator | 1 | 74% | 8 | 22.0 | 1.25 | 0.00 | 0.00 | 2611 | 0.29 | 0.00 |
| | | | 4 | 4 | Flatbed Truck | 1 | 80% | 1 | | 48.21 | 0.00 | 0.03 | 617 | 0.02 | 0.36 |
| 51 | Roll-on/Roll-off Discharge Facility | | 5 | 2 | HMMWVs/Jeeps | 3 | 65% | 3 | 150 | 1.25 | 0.00 | 0.00 | 10994 | 1.22 | 0.00 |
| | | | 5 | 2 | 6-ton truck | 1 | 80% | 1 | | 48.21 | 0.00 | 0.03 | 386 | 0.01 | 0.23 |
| | | | 5 | 2 | Dozer | 1 | 59% | 8 | 240.0 | 1.25 | 0.00 | 0.00 | 14193 | 1.57 | 0.00 |
| | | | 5 | 2 | Cranes | 2 | 43% | 8 | 194.0 | 1.25 | 0.00 | 0.00 | 16723 | 1.85 | 0.00 |
| | | | 5 | 2 | RTVs | 2 | 48% | 8 | 93.0 | 1.25 | 0.00 | 0.00 | 8855 | 0.98 | 0.00 |
| | | | 5 | 2 | LARCV | 2 | | 2 | 350.0 | 10.85 | 2.338 | 0.879935 | 434 | 93.52 | 35.20 |
| 52 | MPF Utility Boat Operator Course | | 9 | 2 | Dozer | 1 | 59% | 8 | 240.0 | 1.25 | 0.00 | 0.00 | 25547 | 2.83 | 0.00 |
| | | | 9 | 2 | Van | 1 | | 2 | | 22.71 | 0.00 | 0.00 | 818 | 0.07 | 0.06 |
| | | | 9 | 2 | LARCV | 2 | | 2 | 350.0 | 10.85 | 2.338 | 0.879935 | 781 | 168.34 | 63.36 |
| 53 | LARC V Operator Training | | 6 | 1 | LARCV | 2 | | 2 | 350.0 | 10.85 | 2.338 | 0.879935 | 260 | 56.11 | 21.12 |
| **4.9.1** | **Conduct Mission Area Training** | | | | | | | | | | | | | | |
| | **NSW Diving and Beach Operations** | | | | | | | | | | | | | | |
| 54 | Lung Automatic Rebreather (LAR) V Closed Circuit Breathing Diving | | 1 | 126 | 4WD Pickups | 3 | | 2 | | 22.71 | 0.00 | 0.00 | 17171 | 1.43 | 1.21 |
| | | | 1 | 126 | Bus | 2 | | 2 | | 89.15 | 0.00 | 0.07 | 44933 | 0.97 | 35.46 |
| 55 | Open Circuit Breathing Diving | | 1 | 12 | 4WD Pickups | 3 | | 2 | | 22.71 | 0.00 | 0.00 | 1635 | 0.14 | 0.12 |
| | | | 1 | 12 | Bus | 2 | | 2 | | 89.15 | 0.00 | 0.07 | 4279 | 0.09 | 3.38 |
| 56 | OTB Field Training Exercise | | 5 | 36 | 4WD Pickups | 3 | | 2 | | 22.71 | 0.00 | 0.00 | 24530 | 2.04 | 1.73 |
| 57 | Rock Portage | | 1 | 20 | 4WD Pickups | 1 | | 2 | | 22.71 | 0.00 | 0.00 | 909 | 0.08 | 0.06 |
| | **NSW Land Warfare** | | | | | | | | | | | | | | |
| 58 | Land Patrolling | | 1 | 18 | 4WD Pickups | 2 | | 2 | | 22.71 | 0.00 | 0.00 | 1635 | 0.14 | 0.12 |

Table C-17
Ground Vehicle GHG Emissions
Alternatives 1 and 2



| Scenario | Type Training | Reference | Days (a) | Operations (b) | Ground Vehicles | Number | Engine Load | Hours per day | Horsepower | Emissions Factors (lb/hr) | | | Emissions (lbs) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | CO2 | CH4 | N2O | CO2 | CH4 | N2O |
| 59 | Immediate Action Drills | | 1 | 6 | 4WD Pickups | 2 | | 2 | | 22.71 | 0.00 | 0.00 | 545 | 0.05 | 0.04 |
| | **NSW Advanced Training** | | | | | | | | | | | | | | |
| 60 | Over the Beach Insertion / Photo Reconnaissance | | 1 | 31 | 4WD Pickup | 2 | | 2 | | 22.71 | 0.00 | 0.00 | 2816 | 0.23 | 0.20 |
| 61 | Photo Image Capture | | 14 | 4 | 4WD Pickups | 2 | | 2 | | 22.71 | 0.00 | 0.00 | 5088 | 0.42 | 0.36 |
| 62 | Field Skills (Observation Drill, Sketching, Range Estimation) | | 1 | 24 | 4WD Pickups | 2 | | 2 | | 22.71 | 0.00 | 0.00 | 2180 | 0.18 | 0.15 |
| 63 | Stalking, Movement and Hide-Sites | | 5 | 8 | 4WD Pickups | 3 | | 2 | | 22.71 | 0.00 | 0.00 | 5451 | 0.45 | 0.39 |
| 64 | CQC/CQD | | 1 | 198 | 4WD Pickups | 5 | | 2 | | 22.71 | 0.00 | 0.00 | 44972 | 3.73 | 3.18 |
| 65 | Communications | | 5 | 6 | 4WD Pickups | 6 | | 2 | | 22.71 | 0.00 | 0.00 | 8177 | 0.68 | 0.58 |
| 66 | Unmanned Aerial Vehicle (UAV) Training | | 5 | 12 | 4WD Pickups | 1 | | 2 | | 22.71 | 0.00 | 0.00 | 2726 | 0.23 | 0.19 |
| 67 | Around the World Training | | 1 | 6 | 4WD Pickups | 4 | | 2 | | 22.71 | 0.00 | 0.00 | 1090 | 0.09 | 0.08 |
| **4.9.4** | **Provide/Execute Training for U.S. and Other Nation Units and Individuals** | | | | | | | | | | | | | | |
| | **NSW Physical Fitness Training** | | | | | | | | | | | | | | |
| 68 | Physical Training Runs | | 1 | 464 | 4WD Pickups | 3 | | 2 | | 22.71 | 0.00 | 0.00 | 63233 | 5.25 | 4.47 |
| 69 | Physical Conditioning Training Exercise | | 1 | 280 | 4WD Pickups | 2 | | 2 | | 22.71 | 0.00 | 0.00 | 25439 | 2.11 | 1.80 |
| 70 | Swim Training | | 1 | 172 | 4WD Pickups | 1 | | 2 | | 22.71 | 0.00 | 0.00 | 7813 | 0.65 | 0.55 |
| 71 | Hell Week | | 5 | 6 | 4WD Pickups | 3 | | 2 | | 22.71 | 0.00 | 0.00 | 4088 | 0.34 | 0.29 |
| 72 | Rucksack March | | 1 | 54 | 4WD Pickups | 3 | | 2 | | 22.71 | 0.00 | 0.00 | 7359 | 0.61 | 0.52 |
| 73 | Monster Mash | | 1 | 6 | 4WD Pickups | 3 | | 2 | | 22.71 | 0.00 | 0.00 | 818 | 0.07 | 0.06 |
| **4.12.6** | **Provide Industrial and Environmental Health Services** | | | | | | | | | | | | | | |
| 74 | Conduct Environmental Health Site Assessment | | 3 | 3 | 4WD Pickups | 4 | | 2 | | 22.71 | 0.00 | 0.00 | 1635 | 0.14 | 0.12 |
| | | | 3 | 3 | 5-ton truck | 1 | | 2 | | 48.21 | 0.00 | 0.03 | 0 | 0.00 | 0.00 |
| | | | 3 | 3 | 3/4-ton trailer | 1 | | 2 | | 48.21 | 0.00 | 0.03 | 0 | 0.00 | 0.00 |
| | | | 3 | 3 | small trailers | 3 | | 2 | | 22.71 | 0.00 | 0.00 | 1227 | 0.10 | 0.09 |
| **6.1.1** | **Conduct Explosive Ordnance Disposal** | | | | | | | | | | | | | | |
| 75 | Conventional Ordnance/Improvised Explosive Device Response | | 1 | 120 | 4WD Pickups | 2 | | 2 | | 22.71 | 0.00 | 0.00 | 10902 | 0.90 | 0.77 |
| 76 | Land Mine Detection/Neutralization | | 1 | 45 | 4WD Pickups / Vans | 2 | | 2 | | 22.71 | 0.00 | 0.00 | 4088 | 0.34 | 0.29 |
| **6.3.1** | **Force Protection: Protect and Secure Area of Operations** | | | | | | | | | | | | | | |
| 77 | Field Training Exercise (FTX) e.g. SEAHAWK | | 14 | 53 | 4WD Pickups | 140 | | 2 | | 22.71 | 0.00 | 0.00 | 4718853 | 391.63 | 333.45 |
| | | | 14 | 53 | Generators | 176 | 74% | 2 | 22.0 | 1.25 | 0.00 | 0.00 | 5327398 | 590.58 | 0.00 |
| | | | 14 | 53 | Forklift | 8 | 48% | 8 | 37.0 | 1.25 | 0.00 | 0.00 | 1056674 | 117.14 | 0.00 |
| **6.3.3** | **Combat Terrorism** | | | | | | | | | | | | | | |
| 78 | Small Boat Attack | | 1 | 36 | None | | | | | | | | | | |
| | | | | | | | | | | | | | **20901965** | **7733.26** | **6100.02** |

Assumptions: Fuel truck is equivalent to 4WD vehicle; large trucks modeled as MDTs. Busses assumed to be diesel powered
Emission factors from ARB's OFFROAD 2007 Model
Generator Emissions from Table C-12
(a) Days = the number of days per operation
(b) Operations = the number of operations per year
Heater is assumed to be "other industrial equipment" from URBEMIS Model.

| | CO2 | CH4 | N2O |
|---|---|---|---|
| **Emissions, short tons/year** | **10451** | **3.87** | **3.05** |
| **Emissions, metric tons/year** | **9481** | **4** | **3** |

Table C-18
Ordnance GHG Emissions
Alternatives 1 and 2

| Scenario | Type Training | Reference | Days (a) | Operations (b) | Ordnance | Number | Type | Compound | Number or Amount | Weight of Compound, grams | CO2 lbs/item | Emissions, lbs/year Total CO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Conduct Maneuver - Move Forces** | | | | | | | | | | | |
| 1 | Anchoring | | 1 | 72 | None | | | | | | | |
| 2 | Towing | | 1 | 30 | None | | | | | | | |
| 3 | Moor to Buoy | | 1 | 36 | None | | | | | | | |
| **1.3.1** | **Perform Mine Countermeasures** | | | | | | | | | | | |
| 4 | Parachute Operations | | 1 | 228 | Smoke Grenades/Flares | 3 | Smoke Gre | *M18 Green* | 684 | | 8.40E-02 | 5.75E+01 |
| | | | | | | | Green Para | M195 | 684 | | 8.80E-02 | 6.02E+01 |
| 5 | MCM Operations | | 1 | 58 | Blast Caps/ Diver Recalls | 1 | Underwater | | | | | |
| 6 | Floating Mine Operations | | 1 | 53 | Blast Caps/ Diver Recalls | 1 | | | 53 | | 0.790 | 4.19E+01 |
| 7 | Dive Platoon | | 1 | 8 | Blast Caps/Explosives | 9 per training | Underwater | | | | | |
| | | | 1 | 8 | 3.5 lb | 8 sequential command detonated | Underwater | | | | | |
| 8 | Very Shallow Water (VSW) Operator Course | | 8 | 6 | Diver Recalls | 2 per training | Underwater | | | | | |
| 9 | VSW Mine Countermeasure Operations | | 1 | 156 | Diver Recalls | 2 per training | Underwater | | | | | |
| 10 | Autonomous Underwater Vehicle (AUV) Operations/UUV Operatio | | 1 | 156 | Blast Caps/ Diver Recalls | 2 per training | Underwater | | | | | |
| 11 | MK8 Marine Mammal/MMS Operations | | 1 | 208 | 13lbs [MK 87/88 C-4 in GRP | Approximately 10% of training inv | Underwater | | | | | |
| | | | | | 29lb [MK86/89 PBXN in AL canis | Approximately 10% of training inv | Underwater | | | | | |
| 12 | Mine Neutralization | | 1 | 4 | Blast Caps/ Diver Recalls | 9 per training | Underwater | | 8 | | 0.790 | 6.32E+00 |
| | | | 1 | 4 | 3.5lb explosive | 8 sequential command detonated | Underwater | | | | | |
| N1 | Shock Wave Generator | | 1 | 90 | Underwater Explosives (15 grams | 1 command detonation | Underwater | | | | | |
| | | | | | Diver Recalls | 1 per training | Underwater | | | | | |
| N2 | Surf Zone Test Detachment/Equipment T&E | | 1 | 200 | None | | | | | | | |
| N3 | UUV Neutralization | | 1 | 4 | Explosives | 2 sequential charges of either 3.3 | Underwater | | | | | |
| | | | 1 | 4 | Seafox (3.3 lb PBXN9) | 2 sequential charges of either 3.3 | Underwater | | | | | |
| | | | 1 | 4 | Archerfish (3.57 lb PBXN10) | | Underwater | | | | | |
| N4 | Mine Hunting | | 1 | 200 | None | | | | | | | |
| N5 | Airborne Laser Mine Detection | | 1 | 48 | None | | | | | | | |
| N6 | Organic Airborne Surface Influence Sweep | | 1 | 100 | None | | | | | | | |
| N7 | Airborne Mine Neutralization | | 1 | 48 | 1.6 kg net explosive (PBXN110) | 1 per training | Underwater | | | | | |
| **1.4.6** | **Conduct Maritime Interception** | | | | | | | | | | | |
| 13 | Visit, Board, Search and Seizure | | 1 | 42 | None | | | | | | | |
| **1.5.4** | **Conduct Amphibious Operations** | | | | | | | | | | | |
| 14 | Small Boat Handling | | 1 | 94 | None | | | | | | | |
| 15 | Swimmer Conditioning - Bay and Ocean with fins | | 1 | 189 | None | | | | | | | |
| 16 | Basic Reconnaissance Course Final Mission | | 1 | 8 | None | | | | | | | |
| 17 | Obstacle Course | | 1 | 142 | None | | | | | | | |
| 18 | Hydrographic Reconnaissance | | 1 | 44 | None | | | | | | | |
| 19 | Surf Observations (SUROBS) | | 1 | 116 | None | | | | | | | |
| 20 | CRRC Inflatable Boat Small (IBS)/Surf Passage/Boat Team Orgar | | 1 | 72 | None | | | | | | | |
| 21 | CRRC Towing and High Speed Maneuver | | 1 | 8 | None | | | | | | | |
| 22 | CRRC Bay Landing Craft Utility (LCU) Launch and Recover - Bay a | | 1 | 24 | None | | | | | | | |
| 23 | CRRC Navigation, Bay and Ocean Runs | | 1 | 26 | None | | | | | | | |
| 24 | Amphibious Raid Course Final Mission | | 1 | 24 | None | | | | | | | |
| 25 | Amphibious Raid Operations | | 3 | 18 | Flares | 3 | Green Para | *M195* | 54 | | 8.80E-02 | 4.75E+00 |
| | | | | | Grenades | 20 | Grenades | *M116A1* | 360 | | 4.10E-03 | 1.48E+00 |

| Scenario | Type Training | Reference | Days (a) | Operations (b) | Ordnance | Number | Type | Compound | Number or Amount | Weight of Compound, grams | CO2 lbs/item | Emissions, lbs/year Total CO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | 9MM | 1490 | 9 MM | | 1490 | | 2.00E-04 | 2.98E-01 |
| | | | | | 5.56MM/38CAL | 520/100 | 5.56 Blank | | 520 | | 2.30E-04 | 1.20E-01 |
| | | | | | | | 38 cal Blank | | 100 | | 9.90E-04 | 9.90E-02 |
| | | | | | Diver Recalls | 3 | Underwater | | | | | |
| 26 | Direct Action (DA) Operations | | 3 | 18 | Explosives | 10 | | | 180 | | 0.790 | 1.42E+02 |
| | | | | | Smoke | 3 | Smoke | | 54 | | 8.40E-02 | 4.54E+00 |
| | | | | | 9MM | 1240 per year | 9 MM | | 1240 | | 2.00E-04 | 2.48E-01 |
| | | | | | 5.56MM/38CAL | 430/90 per year | 5.56 Blank | | 430 | | 2.30E-04 | 9.89E-02 |
| | | | | | | | 38 cal | | 90 | | 9.90E-04 | 8.91E-02 |
| | | | | | Diver Recalls | 3 | Underwater | | | | | |
| 27 | Craft Landing Zone (CLZ) | | 1 | 4 | Smoke | 3 | Smoke | | 12 | | 8.40E-02 | 1.01E+00 |
| N8 | Tactical Recovery of Aircraft and Personnel | | 1 | 4 | Small Arms | 5000 rnds 50 cal/7.62 blanks | 50 cal blank | | 1250 | | 2.10E-03 | 2.63E+00 |
| | | | | | | | 7.62 blank | | 3750 | | 9.50E-04 | 3.56E+00 |
| **1.5.7** | **Conduct Naval Special Warfare** | | | | | | | | | | | |
| 28 | Swimmer/Combat Rubber Raiding Craft Over-the-Beach | | 4 | 86 | Smokes/Flares/Surface Explosiv | 3 flares, 10 grenades | Grenades | *M116A1* | 860 | | 4.10E-03 | 3.53E+00 |
| | | | | | | | Green Par | *M195* | 258 | | 8.80E-02 | 2.27E+01 |
| | | | | | Small Arms | 6600/5000 .5 cal/7.62 mm | 0.5 cal | | 6600 | | 2.10E-03 | 1.39E+01 |
| | | | | | | | 7.62 mm | | 5000 | | 9.50E-04 | 4.75E+00 |
| 29 | Over-the-Beach Stalk | | 1 | 24 | None | | | | | | | |
| 30 | Immediate Action Drills | | 1 | 12 | Smokes/Flares/Surface | 10 | Grenades | *M116A1* | 120 | | 4.10E-03 | 4.92E-01 |
| | | | | | | 3 | Green Par | M195 | 36 | | 8.80E-02 | 3.17E+00 |
| | | | | 6 | Small Arms | 5000 | 0.50 cal/7.62 blank | | 30000 | | 2.10E-03 | 6.30E+01 |
| 31 | Breacher Training | | 1 | 6 | Small Arms | 1400 | 12 gauge | | 1400 | | 1.30E-03 | 1.82E+00 |
| 32 | Amphibious Warfare Exercise | | 1 | 84 | Smoke Grenades/Flares | 3 | | | | | | |
| 33 | Mobility Primary Mission Area | | 1 | 200 | Smoke/Flares | 3 | Smoke | | 600 | | 8.40E-02 | 5.04E+01 |
| 34 | Escape and Evasion | | 1 | 84 | Smoke/Flares | 3 | Smoke | | 252 | | 8.40E-02 | 2.12E+01 |
| N9 | Underwater Demolition Qualification / Certification | | 1 | 12 | 12.5-13.75 pound (underwater) | two sequential 12.5-13.75 pound | Underwater | | | | | |
| | | | 1 | 12 | 25.5-pound (underwater) | two sequential 12.5-13.75 pound charges or a single 25.5-pound charge | | | | | | |
| N10 | Vehicle Patrolling and Testing | | 1 | 50 | None | 0 | | | | | | |
| N11 | NSW Demolition Traning: Demolition Requalifications and Training | | 1 | 12 | Blast Caps/Diver Recall | | Underwater | | | | | |
| | | | | | 5 -10 pounds of C-4 | 1 | Underwater | | | | | |
| **2.2.3** | **Perform Tactical Reconnaissance and Surveillance** | | | | | | | | | | | |
| 35 | Helicopter Rope Suspension Training/Cast & Recovery Operation | | 1 | 154 | Smoke Grenades/Flares | 3 | Smoke | | 462 | | 8.40E-02 | 3.88E+01 |
| 36 | Rappel and Fast Rope Training | | 1 | 11 | None | 0 | | | | | | |
| 37 | SEAL Delivery Vehicle (SDV)/Advanced Seal Delivery System (AS | | 14 | 40 | ≤ 10 lbs C-4 (underwater) | 1 | Underwater | | | | | |
| **4.5.6** | **Construct, Maintain, and Operate Logistics Over-the-Shore** | | | | | | | | | | | |
| 38 | OPDS | | 25 | 6 | None | 0 | | | | | | |
| 39 | Amphibious Bulk Liquid Transfer System (ABLTS) | | 10 | 5 | None | 0 | | | | | | |
| 40 | Barge Ferry/Causeway Coxswain Training | | 3 | 54 | None | 0 | | | | | | |
| 41 | Causeway Pier Insertion and Retraction | | 5 | 10 | None | 0 | | | | | | |
| 42 | Elevated Causeway System (ELCAS) | | 10 | 4 | None | 0 | | | | | | |
| 43 | Establish Beach Party Command Post | | 4 | 16 | 5.56 caliber rounds | 30 | 5.56 Blank | | 30 | | 2.30E-04 | 6.90E-03 |

Table C-18
Ordnance GHG Emissions
Alternatives 1 and 2

| Scenario | Type Training | Reference | Days (a) | Operations (b) | Ordnance | Number | Type | Compound | Number or Amount | Weight of Compound, grams | CO2 lbs/item | Emissions, lbs/year Total CO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | 7.62 caliber blanks | 100 | 7.62 caliber blanks | | 100 | (b) | 9.50E-04 | 9.50E-02 |
| 44 | Sterngate Marriage to Amphibious Ship/LCU | | 1 | 40 | None | 0 | | | | | | |
| 45 | LCU/LCM Beaching | | 1 | 60 | None | 0 | | | | | | |
| 46 | LCU/LCM Towing/Being Towed | | 1 | 60 | None | 0 | | | | | | |
| 47 | Communications Training | | 2 | 2 | 0 | | | | | | | |
| 48 | Field Training Exercise with a Beach Camp | | 14 | 2 | 5.56 caliber rounds | 30 | 5.56 Blank | | 30 | (c) | 2.30E-04 | 6.90E-03 |
| | | | | | 7.62 caliber blanks | 100 | 7.62 caliber blanks | | 100 | (c) | 9.50E-04 | 9.50E-02 |
| 49 | Maritime Pre-positioning Ships (MPS) Offload | | 5 | 2 | None | 0 | | | | | | |
| 50 | Reverse Osmosis Water Purification Unit | | 4 | 4 | None | 0 | | | | | | |
| 51 | Roll-on/Roll-off Discharge Facility | | 5 | 2 | None | 0 | | | | | | |
| 52 | MPF Utility Boat Operator Course | | 9 | 2 | None | 0 | | | | | | |
| 53 | LARC V Operator Training | | 6 | 1 | None | 0 | | | | | | |
| **4.9.1** | **Conduct Mission Area Training** | | | | | | | | | | | |
| | **NSW Diving and Beach Operations** | | | | | | | | | | | |
| 54 | Lung Automatic Rebreather (LAR) V Closed Circuit Breathing Divi | | 1 | 126 | Diver Recall | 1 | Underwater | | | | | |
| 55 | Open Circuit Breathing Diving | | 1 | 12 | Diver Recall | 1 | Underwater | | | | | |
| 56 | OTB Field Training Exercise | | 5 | 36 | Small arm | 15000 7.62mm; 19800 .5cal ANN | 7.62 mm | | 15000 | | 6.80E-04 | 1.02E+01 |
| | | | | | | | 0.5 cal | | 19800 | | 2.10E-03 | 4.16E+01 |
| 57 | Rock Portage | | 1 | 20 | Smoke Grenades/Flares | 3 | Smoke | | 60 | | 8.40E-02 | 5.04E+00 |
| | | | | | | | Grenades | *M116A1* | 60 | | 3.70E-04 | 2.22E-02 |
| | **NSW Land Warfare** | | | | | | | | | | | |
| 58 | Land Patrolling | | 1 | 18 | None | 0 | | | | | | |
| 59 | Immediate Action Drills | | 1 | 6 | .5CAL/7.62 BLANK | 5000 RNDS each per operation (3 | 0.5 cal | | 30000 | | 2.10E-03 | 6.30E+01 |
| | | | | | | | 7.62 caliber blanks | | 30000 | | 9.50E-04 | 2.85E+01 |
| | **NSW Advanced Training** | | | | | | | | | | | |
| 60 | Over the Beach Insertion / Photo Reconnaissance | | 1 | 31 | Small arms/blanks | 10 9 mm blanks; 10 5.56 blanks p | 9 mm blank | | 310 | | 2.00E-04 | 6.20E-02 |
| | | | | | | | 5.56 mm blank | | 310 | | 2.30E-04 | 7.13E-02 |
| 61 | Photo Image Capture | | 14 | 4 | Small arms/blanks | 10 9 mm blanks; 10 5.56 blanks p | 9 mm blank | | 40 | | 2.00E-04 | 8.00E-03 |
| | | | | | | | 5.56 mm blank | | 40 | | 2.30E-04 | 9.20E-03 |
| 62 | Field Skills (Observation Drill, Sketching, Range Estimation) | | 1 | 24 | Small arms/blanks | 10 9 mm blanks; 10 5.56 blanks p | 9 mm blank | | 240 | | 2.00E-04 | 4.80E-02 |
| | | | | | | | 5.56 mm blank | | 240 | | 2.30E-04 | 5.52E-02 |
| 63 | Stalking, Movement and Hide-Sites | | 5 | 8 | None | 0 | | | | | | |
| 64 | CQC/CQD | | 1 | 198 | Small Arms | 104600 9 MM simunition; 36300 5.56 simunition; | | | | | | |
| | | | | | Small Arms | 7200 | 9 MM | | 7200 | | 2.00E-04 | 1.44E+00 |
| | | | | | Small Arms | 10000 | 5.56 Blank | | 10000 | | 2.30E-04 | 2.30E+00 |
| | | | | | Small Arms | 7300 .38 cal | .38 cal | | 7300 | | 9.90E-04 | 7.23E+00 |
| | | | | | Grenades (flash crash) | 3 | Grenades | *M116A1* | 594 | | 3.70E-04 | 2.20E-01 |
| 65 | Communications | | 5 | 6 | None | 0 | | | | | | |
| 66 | Unmanned Aerial Vehicle (UAV) Training | | 5 | 12 | none | 0 | | | | | | |
| 67 | Around the World Training | | 1 | 6 | none | 0 | | | | | | |
| **4.9.4** | **Provide/Execute Training for U.S. and Other Nation Units and** | | | | | | | | | | | |
| | **NSW Physical Fitness Training** | | | | | | | | | | | |
| 68 | Physical Training Runs | | 1 | 464 | None | 0 | | | | | | |
| 69 | Physical Conditioning Training Exercise | | 1 | 280 | None | 0 | | | | | | |
| 70 | Swim Training | | 1 | | None | 0 | | | | | | |
| 71 | Hell Week | | 5 | 6 | Smokes | 128 per year | Smoke | | 128 | | 8.40E-02 | 1.08E+01 |

Table C-18
Ordnance GHG Emissions
Alternatives 1 and 2

| Scenario | Type Training | Reference | Days (a) | Operations (b) | Ordnance | Number | Type | Compound | Number or Amount | Weight of Compound, grams | CO2 lbs/item | Emissions, lbs/year Total CO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Grenade Simulators | 200 per year | Grenades | *M116A1* | 200 | | 4.10E-03 | 8.20E-01 |
| | | | | | White Para Flares | 12 per year | Flares | *M127A1* | 12 | | 3.80E-03 | |
| | | | | | 7.62 Blank (A111) | 27000 per year | 7.62 mm | | 27000 | | 9.50E-04 | 2.57E+01 |
| | | | | | 50 CAL Blank | 2000 per year | 0.5 cal | | 2000 | | 2.10E-03 | 4.20E+00 |
| 72 | Rucksack March | | 1 | 54 | None | 0 | | | | | | |
| 73 | Monster Mash | | 1 | 6 | None | | | | | | | |
| **4.12.6** | **Provide Industrial and Environmental Health Services** | | | | | | | | | | | |
| 74 | Conduct Environmental Health Site Assessment | | 3 | 3 | None | 0 | | | | | | |
| **6.1.1** | **Conduct Explosive Ordnance Disposal** | | | | | | | | | | | |
| 75 | Conventional Ordnance/Improvised Explosive Device Response | | 1 | 120 | 0 | | | | | | | |
| 76 | Land Mine Detection/Neutralization | | 1 | 45 | 0 | | | | | | | |
| **6.3.1** | **Force Protection: Protect and Secure Area of Operations** | | | | | | | | | | | |
| 77 | Field Training Exercise (FTX) e.g. SEAHAWK | | 14 | 53 | 0.50 cal blanks | 15650 per year | | | 15650 | | 2.10E-03 | 3.29E+01 |
| | | | | | Grenades/flares | 66 per year | Grenades | *M116A1* | 66 | | 4.10E-03 | 2.71E-01 |
| | | | | | M16 Rounds | 8250 per year | | | 8250 | | 7.80E-03 | |
| | | | | | M60 Rounds | 8250 per year | | | 8250 | | 7.80E-03 | |
| | | | | | 9mm Rounds | 6600 per year | | | 6600 | | 2.00E-04 | 1.32E+00 |
| **6.3.3** | **Combat Terrorism** | | | | | | | | | | | |
| 78 | Small Boat Attack | | 1 | 36 | .50 cal rounds | 350 per exercise | | | 12600 | | 2.10E-03 | 2.65E+01 |

# Appendix D
# Record of Non-Applicability

# RECORD OF NON-APPLICABILITY (RONA) FOR CLEAN AIR ACT CONFORMITY
## Silver Strand Training Complex EIS

## INTRODUCTION

The U.S. Environmental Protection Agency (USEPA) published *Determining Conformity of General Federal Actions to State or Federal Implementation Plans; Final Rule*, in the 30 November 1993, Federal Register (40 CFR Parts 6, 51, and 93). The U.S. Navy published *Interim Guidance on Compliance with the Clean Air Act General Conformity Rule* in Appendix F, OPNAVINST 5090.1C, dated 30 October 2007. These publications provide implementing guidance to document Clean Air Act Conformity Determination requirements.

Federal regulations state that no department, agency, or instrumentality of the Federal Government shall engage in, support in any way or provide financial assistance for, license to permit, or approve any activity that does not conform to an applicable implementation plan. It is the responsibility of the Federal agency to determine whether a Federal action conforms to the applicable implementation plan, before the action is taken (40 CFR Part 1 51.850[a]).

Federal actions may be exempt from conformity determinations if they do not exceed designated *de minimis* levels for criteria pollutants (40 CFR Part 51.853[b]). *De minimis* levels (in tons/year) for the air basin potentially affected by the Proposed Action are listed in Table 1.

**Table 1**
***De minimis* Levels for Criteria Pollutants in the San Diego Air Basin**

| Criteria Pollutant | *De minimis* Level (tons/year) |
|---|---|
| Carbon Monoxide (CO) | 100 |
| Reactive Organic Gases (ROG) | 100 |
| Oxides of Nitrogen ($NO_x$) | 100 |

## PROPOSED ACTION

Action Proponent: The U. S. Department of the Navy.

Location: Silver Strand Training Complex, NAB Coronado, San Diego, California.

Proposed Action Name: Silver Strand Training Complex EIS

Proposed Action Summary: The Navy proposes to conduct and enhance existing and future readiness training at Silver Strand Training Complex to meet the evolving military mission of combat readiness. The Proposed Action would increase the tempo of training, introduce new types of training activities, conduct existing routine training at new locations within SSTC training areas, construct a demolition pit at SSTC-S, introduce new platforms and equipment, and increase access and availability to SSTC training areas.

SSTC is located on a narrow, sandy isthmus separating San Diego Bay from the Pacific Ocean in San Diego County, California. Comprising SSTC-North (SSTC-N) (historically referred to as Naval Amphibious Base [NAB] Coronado) and SSTC-South (SSTC-S) (formerly Naval Radio Receiver Facility [NRRF]), SSTC has supported naval training operations since 1942. Included in this EIS as part of SSTC is that part of the shore and near shore waters of Naval Air Station North Island (NASNI) utilized for amphibious and special warfare training, historically from sandy Breaker's Beach to the rocky Zuniga Point and Jetty.

The goals of the range enhancements are to: (1) increase training realism and diversity by supporting dynamic joint U.S. homeland defense requirements, unit and command level mission essential training elements, and non-traditional overseas deployment needs; (2) improve access to contiguous coastline and over-the-beach training areas; and (3) reduce the constraints of encroachment on training, readiness, and Research, Development, Test and Evaluation (RDT&E).

The Proposed Action addressed in this EIS combines three elements:

- Realign existing training activities to achieve training diversity and increased realism
- Increase existing training operations and introduce new training activities
- Implement range sustainability measures to enhance training capabilities while meeting conservation and stewardship obligations

Emissions associated with the Proposed Action are attributable to increases in training operations and tempo.

Air Emissions Summary: As described above, the Proposed Action includes increases in training tempo and new training activities on the SSTC range. Participants in training activities include aircraft, marine vessels, and ground vehicles. Ordnance use is also proposed for training activities.

Factors needed to derive construction source emission rates were obtained from *Compilation of Air Pollutant Emission Factors, AP-42, Volume I* (USEPA 2007), the EMFAC2007 model (for ground vehicles), the Navy Aircraft Environmental Support Office (for aircraft), and the database developed for Naval Sea Systems Command (NAVSEA) by JJMA Consultants (JJMA 2001) (for marine vessels).

Based on the air quality analysis for the proposed action, the maximum estimated emissions would be below conformity *de minimis* levels for the SDAB (Table 2).

| Table 2<br>Estimated Total Net Project Emissions - Tons per Year | | | |
|---|---|---|---|
| | Pollutant | | |
| | CO | NOx | ROG |
| Baseline Emissions | 200.4 | 176.5 | 52.1 |
| Proposed Action Emissions | 248.2 | 216.3 | 64.1 |
| Net Emissions Increase (Decrease) | **47.8** | **39.8** | **12.0** |
| General Conformity *De minimis* Thresholds (Tons per year) | 100 | 100 | 100 |
| Exceed threshold? | No | No | No |

Date RONA prepared: June 19, 2010

## EMISSIONS EVALUATION AND CONCLUSION

Emissions associated with operations for the proposed action were calculated based on standardized methodologies. Emissions were then compared with *de minimis* thresholds for the air basins in which they would occur.

The Department of the Navy concludes that *de minimis* thresholds for applicable criteria pollutants would not be exceeded as a result of implementation of the proposed action. The emissions data supporting that conclusion are shown in Table 2, which provide a summary of the calculations, methodology, data, and references included in Appendix C of the EIS for the proposed action. Therefore, the Department of the Navy concludes that further formal Conformity Determination procedures are not required, resulting in this Record of Non-Applicability.

## RONA APPROVAL

To the best of my knowledge, the information presented in this Record of Non-Applicability is correct and accurate and I concur in the finding that the Proposed Action is not subject to the General Conformity Rule.

Approved: C. L. Stathos Date: 14 October 2010

C. L. STATHOS CNRSW N40

# Appendix E
# Public Participation

# APPENDIX E

## TABLE OF CONTENTS

# E PUBLIC COMMENTS

The Navy received public comments on the Silver Strand Training Complex (SSTC) Draft Environmental Impact Statement (EIS) via four media: written comments, information station comments, website comments, and oral comments. Regardless of the medium, all comments have been treated equally. The comments are from the public comment period (January 22, 2010 through March 9, 2010) and the public comment period extension for the document (March 9, 2010 through March 30, 2010).

Comments were received primarily through the mail, website, and orally or at information stations at the public hearings. Written comments were submitted directly to the Navy. Website comments were submitted to the Navy via the project website. Oral comments were taken directly from the official court reporter transcripts. The comments have been reproduced faithfully and as accurately as possible. In some cases, the editors may have made minor errors in the translation of some handwritten letters. For this reason, a copy of each of the comments has been placed in Appendix E. Private individuals are presented first and are sorted alphabetically. Comments submitted by organizations are then presented, also in alphabetic order. Appendix E also contains the official court transcripts of the oral comments made at the public hearings. Website and information station comments were electronically submitted and copied directly into this Appendix, so no other reproduction was necessary.

In preparing the Draft EIS each resource section was prepared and reviewed by numerous qualified individuals, each specialists in their respective fields, to ensure that the resources and issues received a rigorous and thorough assessment. The best available scientific data and the latest peer-reviewed studies were considered.

In this Final EIS, the Navy has made changes to the Draft EIS, based on comments received during the public comment period. These changes included factual corrections, additions to existing information, and improvements or modifications to the analyses in the Draft EIS. This section presents the public comments received and the Navy's responses to these comments. The public should note that these changes are non-substantive and do not result in any significant modifications to the proposed action, the alternatives considered, the affected environment, or the environmental effects analyses of the Draft EIS.

Although all comments have been read and considered, some comments were not specific regarding the analyses or the alternatives in the Draft EIS and, therefore, could not be given specific responses and are not reproduced in Appendix F. As stated in the Council on Environmental Quality's (CEQ) Regulations for Implementing the National Environmental Policy Act (NEPA), 40 CFR Part 1503.3(a), "Comments on an environmental impact statement or on a proposed action shall be as specific as possible and may address either the adequacy of the statement or the merits of the alternatives discussed or both."

To allow side-by-side review of the comments and the Navy responses, all comments have been converted to text and entered into a table format that follows in Appendix F, with the comment in one column and the Navy's response in the next column. Comments are presented in the same order in Appendix F as they are in this Appendix.

## E.1 COMMENTS FROM PRIVATE INDIVIDUALS

The comments in this section were received in written form by organizations, agencies, tribes and individuals.

### E.1.1 William J. Adams

William J. Adams
P. O. Box 181458
Coronado, CA 92178
(619) 233-3025

March 5, 2010

Naval Facilities Engineering Command, Southwest
Attn: Mr. Kent Randall – Silver Strand Training Complex EIS
1220 Pacific Highway, Building 1, 5th floor
San Diego, CA 92132

Re: Draft EIS for Silver Strand Training Complex – ***Section 3.8 Fish***

Dear Mr. Randall:

This letter is in regard to the Silver Strand Training Complex draft EIS, dated January, 2010. The comments are in reference to Section 3.8 Fish, specifically in regards to SAND CRABS along the Silver Strand beach and Coronado beach.

Here is some information about myself. I am a surf fisherman and have fished in Coronado and on the Silver Strand since 1949, along with many others. I have provided, at the end of this letter, the names and telephone numbers of some of them who are still alive and continue to fish, so that you can contact them if you wish to do so.

Besides these people, you may want to contact the following and ask the question, "who is this guy."

| | |
|---|---|
| Larry Kracht | (619) 435-9027 |
| Tom Smisek | (619) 435-3710 |
| Frances Adams | (619) 435-2923 |

For those who do not know what sand crabs are, they are the primary food for fish, sharks, rays, birds and specifically Corbina (during the summer months). The Corbina is a primary fish that surf fisherman are after during the summer. However, during a GRUNION run, they are the primary food for large Corbina and Halibut.

FACT: Over the last six or seven years the population of sand crabs has dropped to almost zero. Any surf fisherman can tell you that. Of course, there are lots of theories of what has caused this. Some people believe it is because of the raking of the sea weed off the beach, etc. But the Navy does not do this along their beach and still there are no sand crabs.

The primary question that should be answered is why there are sand crabs at Imperial Beach, Mission Beach, Carlsbad and Huntington Beach.

I believe that one of the major problems is the fuel emissions from the boats, etc., along the Silver Strand beach is the cause of the problem.

What I am asking for is the following:

(1) Delay for at least 60 days before this report is final so that other fishermen can comment on this draft.

(2) The City of Coronado updates its water pollution equipment to measure the fuel emissions along Coronado beach.

(3) Have an independent, scientific statistical study (at some level of confidence) to find out what happened to the sand crabs along Coronado beach. Maybe SDSU, SDU, or UCSD could perform this study with the funds being provided by the Federal Government.

(4) Until this study is completed, stick with ALTERNATIVE I, NO ACTION ALTERNATIVE.

Following is a list of the fishermen you may want to contact:

| | | |
|---|---|---|
| Tom Williams | (714) 964-4434 | ** |
| William Adams | (619) 435-2923 | |
| Ernie Mauro | (619) 887-1076 | ** |
| Russell Elwell | (619) 435-3833 | ** |
| Tom Noonan | (619) 435-4097 | ** |
| Tom Jeter | (619) 437-4646 | |
| Tom Christienson | (619) 435-7176 | |
| Wilson Whitmire Capt, USN, Ret. | (615) 591-5289 | ** |

** Surf fishermen since 1949.

Sincerely,

William J. Adams

### E.1.2 William J. Adams

William J. Adams
P. O. Box 181458
Coronado, CA 92178
(619) 233-3025

March 27, 2010

Naval Facilities Engineering Command, Southwest
Attn: Mr. Kent Randall – Silver Strand Training Complex EIS
1220 Pacific Highway, Building 1, 5th floor
San Diego, CA 92132

Re: Draft EIS for Silver Strand Training Complex – **Section 3.8 Fish**

Dear Mr. Randall:

Thank you very much for extending the comments (to the Draft EIS) until late March.

This letter expands on my comments to you dated March 5, 2010 on Section 3.8 Fish. Since then, some fishermen and others have asked me to add the following comments:

(1) Sand crabs feed on tiny "plankton".

(2) A female may produce thousands of eggs. She carries them until the eggs hatch. For two to four months, the "larvae" drift as "plankton".

What I believe is that these and other types of "plankton" are being killed by fuel emissions from the boats, etc. Along the Silver Strand Training Complex, since the Navy has expanded the use of the beach over the last six to seven years, the water has become more polluted from the fuel emissions.

What I am asking for is that until some studies are conducted to determine what has happened to the sand crabs, the Navy go with the "NO ACTION ALTERNATIVE".

Sincerely,

William J. Adams

### E.1.3 Barbara Angioletti

Representing: Private Individual

Organization:

Name: Barbara Angioletti

Date: 3/30/2010 11:43:06AM

Subject: Military Training Activities

Comment: As a resident of Coronado for 15 years I have witnessed the increase of military training & understand the importance of this to protect our country. I have read the proposal in re to the increase of training & in my opinion the increase is tremendous!!! Yes,you need more training but you also have to consider the area that this is in. We want our children to have the best & not hear the helicopters,etc. all day long. The military housing is in this area & the families there will have to live with these noises. I do believe you have to increase the training but not to the extent that you are proposing.

### E.1.4 Anonymous

Representing: Private Individual

Organization:

Name: anon anon

Date: 2/23/2010 11:49:32AM

Subject: Other

Comment: The EIS file is large and hard to download.

### E.1.5 Virginia Aspe Armella and Eduardo Cortina

March 19, 2010.

Naval Facilities Engineering Command
Attn: Mr. Kent Randall
Silver Strand Training Complex EIS
1220 Pacific Highway, Building 1, 5th Floor
San Diego, CA 92132

Dear Mr. Randall,

I am a resident of Coronado and I live in Coronado Shores, Cabrillo Building.

I have learned that the Department of the Navy is planning on increasing the levels of training at the Silver Strand Training Center.

Suggested comments: I would appreciate your cooperation and efforts to maintain the quiet enjoyment atmosphere of the Coronado Shores, Cays, and Village as it currently exists.

Sincerely,

VIRGINIA ASPE ARMELLA

EDUARDO CORTINA I.

### E.1.6 Andrew Bailey

Representing: Private Individual

Organization:

Name: Andrew Bailey

Date: 3/10/2010 3:00:21AM

Subject: Environmental Justice

Comment: Overall, after perusing the SSTC Draft EIS, I still want to be super-supportive of the Sailors and Marines (DofN) but have exceptions to some of the proposals and assumptions in the EIS. I realize that training these forces well will be good for the environment in the aspect that they will be able to wage war more efficiently. Still, we – they – are at war, and there will be "unavoidable adverse environmental effects." I was impressed and entertained by the EIS and support Alternative One but suggest more consideration in the following areas: • Contingency plans for Alternative Two • Public notice about public access to beaches • Notice about nighttime activities • Mitigation measures in land use and detonations Please, send a strong message by making contingency plans to implement Alternative Two. DofN should be ready to go a level higher to achieve objectives, and still have best practices. I also encourage beach activities "not limited to any day of the year" (3.1.2.2.2). [Did a lawyer write that?] At the same time, DofN could keep us civilian-beach-patrons informed about open beach hours. Perhaps the EIS Website can be converted into a beach-recreation information platform, with the option to call the NBC switch board. This would count as a land-use mitigation (3.1.1.7). If you're having a party, you invite your neighbors.... Unfettered access to wet-sand areas on – say – four (4) daytime ultra-low tide events (-1.5' or more), and a couple daytime ultra-high tide events (6.5' or more) is fair quiet enjoyment. Concerted planning is already a protocol (5.15.3-4). Occasional access to Breakers Beach up to Zuniga Point seems fair too. The SP, duty assignments, and service members with restriction can keep civilians below the high-tide line. Perhaps DofN, in all its magnanimity, could share a drinking fountain, or a toilet. Look at the MAS Mira Mar Air Show. A staff member for this EIS, Alex, who like myself, enjoys beach running, did not know that we have access to most wet sand areas when there are no SSTC training activities. I carefully questioned another staff member about this (Bruce), but it seems contradicted by the EIS (3.1.2.2.2). I wish the beach entrance between SSTC-N & Coronado Shores was better marked with a fair sign. I noticed that the SSTC-N lease extends only to the mean high tide line but shifts to "100 to 500 feet offshore." I can share the beach. Coronado residents should have advance notice about night operations so they can have the option to spend the night elsewhere. SSTC needs to have better communication with civilians and a website as a beach-recreation information platform could serve day-to-day needs. Overall, the lands leased by the DofN spend more time unused, than with activities. Mitigation like restoring beaches after activities is expected and training protocols help, but the fact is that activities will increase 20% - other mitigations should be considered to offset this increase. I read that one mitigation measure is to manage predators. An extension would be to coerce other beach users to observe a higher level of stewardship. DofN with its unfathomable resources needs to outreach. SSTC spends most of its time as an absentee landowner. Bruce, an EIS staffer, explained that dog owners loose there dogs in the training areas. Dogs (and cats) area a terror to wildlife, wreak habitat, and leave damaging feces. Off-the-leash dogs are a problem city-wide and on the beach. One section mentioned "avoidance and minimization." I could see a special program with the Cays, educational signs, and volunteer enforcement. MAYBE Cesar Milan would lend a hand. Other mitigation was dismissed in this EIS "alternative" (5.9.3). Third-party observers are a cultural norm in the United States today: some people would kill Flipper for a tuna sandwich! There's no excuse for not trying to manage it, especially considering the extremity of the action. I'd be pleased to say a little prayer for the fish: that they fatten the beachmaster. I can see Point Loma from my house, and my neighborhood's topography is in one of the charts. The Strand may be my home break. I could write more.

### E.1.7 Richard Barck

Silver Strand Training Complex EIS – RESPONSE

To: Naval Facilities Engineering Command, Southwest

Attn: Mr. Kent Randall, Silver Strand Training Complex EIS

1220 Pacific Highway, Building 1, 5th Floor, San Diego, CA 92132

From: Richard Barck 86 Kingston Court West, Coronado CA 92118 Richard T. Barck March 3, 2010

**Subject: Response to Draft EIS, SSTC**

I have listed below a number of points related to Navy anticipated use of SSTC-S which cause me concern:

1) **SSTC -S (nee NRRF)** – The Navy comments that SSTC has been established for over 60 years is disingenuous with regard to stating the local residential community around SSTC-S "should expect air and ground noise" in the proximity of the base. For residents building/purchasing homes in the SSTC-S/NRRF area, there was nothing more quiet than a radio receiving facility. **SSTC-S was renamed from NRRF (**Naval Radio Receiving Facility) during the period of the EIS study. The Federal Register of August 6, 2001 describes the **Notice of Intent to Propose EIS (pp. 41009-41010)** as including the NAB and the NRRF. In fact several references in the EIS still refer to NRRF, not SSTC-S (e.g., Fig. 3.11-4).
   Any training of amphibious landing and helicopter support has taken place **only** in the past few years. And it is NOT quiet – per the EIS, noise from both munitions and helicopters is projected to dramatically increase. This should NOT be done in a residential zone.
2) **Helicopter, Aircraft & Amphibious Noise –** As residents local to SSTC-S we live in a particularly quiet area, especially during evenings and nights. There is relatively little traffic on CA-79 and many of us have doors/windows open to the sounds of breaking waves. Over the past couple of years we have been increasingly subject to LOUD helicopters/aircraft flying "close" to our homes. The sound prevents us from hearing evening TV -- or awakens us at night. When awakened, we often cannot immediately return to sleep. The noise could be greatly reduced by flying the helicopters/aircraft further offshore while on sorties north/south along the Silver Strand. We, as well as the residents of Navy housing, would appreciate that very much!
3) **SSTC-N** – The portion of SSTC now called STTC-N (but formerly NAB) has been used for amphibious landing training for an extended period. Increased amphibious landings, helicopter activities and munitions training should be restricted to Boat Lanes 1 – 10.
4) **Snowy Plovers** – Fish & Wildlife has formulated a significant effort in the last few years to increase Snowy Plover nesting/fledging in the SSTC -S area. *Results for 2009 are in the table on the following page. Silver Strand SB is the beach area with overnight facilities for RVs and heaviest beach use. Silver Strand NP contains staked-off area protecting nesting for the Snowy Plovers and Least Terns.* The Navy should also be aware of the success in nesting and fledglings in the SSTC -S/NRRF.
5) **Vernal Pools and Fairy Shrimp –** Vernal Pools are becoming few and far between, both as a result of drought and/or heavy pedestrian or vehicle use of the area(s) where they are found. There are very good protected Vernal Pool locations within SSTC -S/NRRF.
   Although the Navy has said that these area would be "protected" while wet, they would be used as trails and subject to traffic during "dry periods". Trails through Vernal Pools will effectively destroy them! They should continue to be protected.
6) **Beach White 1 / Boat Lane 11 –** From the view in Fig. 1-3, the training area appears to encroach on the southern edge of Silver Strand State Beach, an especially significant area for nesting of Snowy Plovers.
7) **Beach Access –** Many morning walkers and joggers use the Silver Strand NP as their starting point for extended exercise. A significant number continue these workouts headed south to the Imperial Beach area – or vice-versa. The access past NRRF has been through the sand area below the high tide line. The apparent closing of this area deprives the public of even more beach access in a beach-limited area.
8) **Silver Strand State Scenic Highway and Scenic Highway Overlay Zone –** What impacts will the increased activities have on CA-79 as a scenic highway in this area?

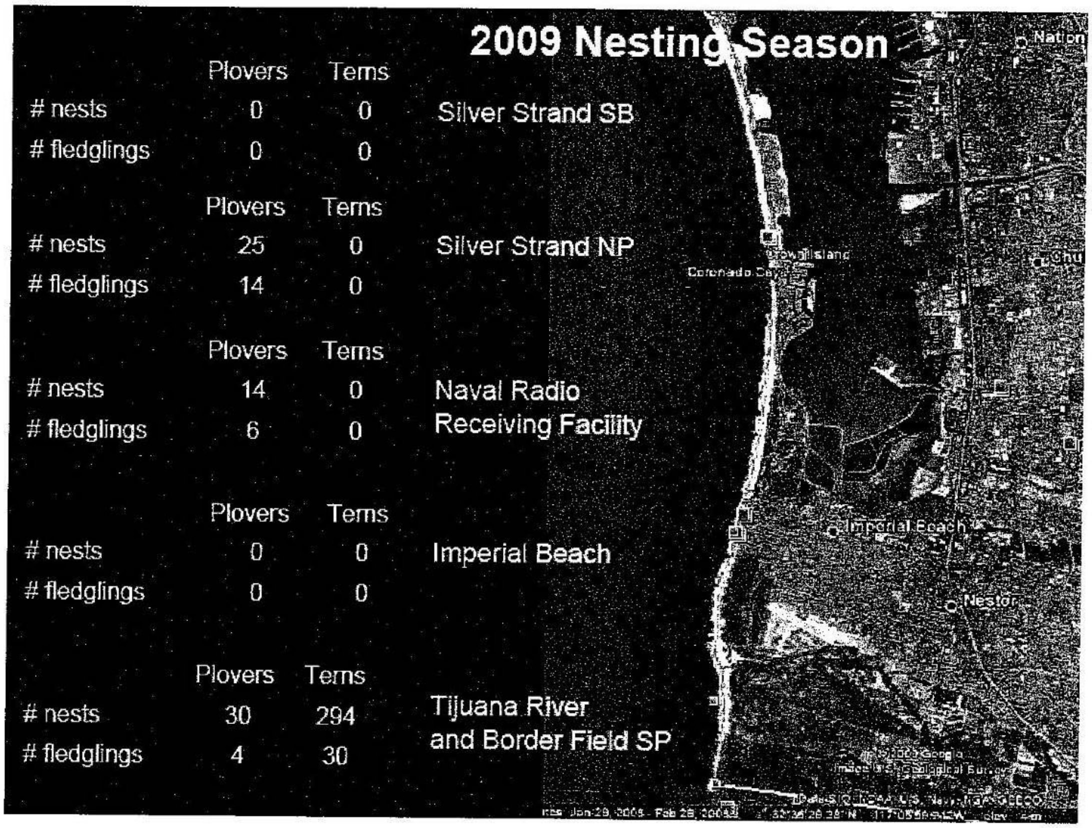
Page **1** of **2**

Silver Strand Training Complex EIS – RESPONSE

9) **Silver Strand Elementary School** – What effect will the escalated training have on our elementary school including noise and pollution affecting our students and teachers?

10) **Surf Camp** – The surf camp at the southwest end of the NRRF site serves ~ 10,000 kids/year. We would like this to continue and their access to the beaches to remain safe and free of pollutants.

Thank you.




### E.1.8 Edward Baumer

I am a resident of Coronado and I live at Coronado Shores in El Mirador and overlook your facility from the 16th floor. The address is Ann Kennedy, 1820 Avenida del Mundo, #1603, Coronado, Ca 92118.

I have learned that the Department of the Navy is planning on increasing the levels of training at the Silver Strand Training Center. I hope that you can provide the level of quiet enjoyment that I have experienced for the last 8 years as I am a full time resident.

### E.1.9 Michael B. Baxter

Kent Randall 3/9/2010
Silver Strand Training Complex EIS
Naval Facilities Command, Southwest
1220 Pacific Highway, Building 1, 5th Floor
San Diego, CA 92132

Dear Mr. Randall,

I appreciate the opportunity to offer some further input and perspective on the proposed expansion of activities which will occur in the Imperial Beach area and Silver Strand Training Complex (SSTC).

As a matter of disclosure, I have reviewed the letter sent to you by the City of Imperial Beach dated March 5, 2010, and agree with their observations and requests.

My comments herein should be considered in addition to theirs, and will be, I believe, concordant with them. I also have had the advantage of living on the oceanfront on South Seacoast Drive, north of Ream Field and south of Imperial Beach Boulevard for roughly the past 38 years. My comments are based on that period of observation.

My first observation is that helos departing Ream Field do not maintain the centerline of the runway, or projection of it, from the field or landing pads all the way out to sea for a distance of about 1 3/4 miles

1.

which I believe is the prescribed route for a visual departure (VFR Rules of Departure). I have publically asked for a copy of these departure rules in public in the past and they have never been provided. I hereby ask for them again under the Freedom of Information Act.

Instead of following the VFR departure rules, too many times the aircraft drift off their departure radial, towards the Pier. My observation, and that of others, is that once they are over the surfline too many times They begin their turn toward the north and head for the pier. This turn should not be commenced until the seaward track is complete, about 1 3/4 miles.

Many of us have observed Navy helos well inside the end of the pier. They then turn to sea again to "get around" the end of the pier before continuing north.

All this could be avoided by simply following the VFR Departure Rules, as I believe I've seen in the past.

I would also ask that the VFR Departure pattern be amended so that departing helos continue to climb, perhaps to 450-500' as they depart Ream Field. This would also reduce noise considerably.

2. Let me address the night hours of operation next.

I agree with the City's position (Item 4b) that "there should be no helicopter training at Ream Field after 9:30 pm."

I understand that from time-to-time a helo goes off course in its VFR departure from Ream Field. But I believe that far too much of this occurs and the community and residents are unable to effectively document this for the Navy with the present Complaint System.

It is a system which has failed you and costs The Navy in public support and goodwill.

With the proposed increase in flight operations out of Ream Field, I recommend the following:

1. Place the officer who takes Citizen Complaints related to Ream Field Helos in the Ream Field tower, or a location very close by so he can easily determine the probable sidenumber of aircraft over the beach. Require that the aircraft commander 'report' the completion of his seaward track when he is 1 3/4 miles out, back to the Tower or Duty Officer. Remember that a citizen can not often see the sidenumber against the setting sun, twilight or night-time conditions. This step would materially improve a complaint system which most of us rate as nonresponsive and a failure.

3.

2. Require that the Citizen Complaint Officer stay at his post during his watch period. I would presume that these are four hour watches when flight operations are underway. He can bring a bag lunch, or a box lunch can be provided him. The main point is that he/she is there to receive citizen complaints as they are occuring, not sometime later, from some very distant spot
3. He should provide some sort of file number to the Caller for future reference or follow up.
4. The results should be reported to the community, perhaps Quarterly, to inform the policy-makers and the citizens.

I wish to acknowledge that many departures out of Ream Field are correctly done now, day and night both. And further, we appreciate everything which the military does to protect and defend this nation.

By the same token, we should be willing to receive and take to heart constructive criticism when it is warranted. I offer my observations and comments in that spirit.

Sincerely,

Michael B Bybee
1192 Seacoast Dr
Imperial Beach, Ca 91932

4.

### E.1.10 Jim Besikof

Representing: Private Individual

Organization:

Name: Jim Besikof

Date: 3/1/2010 5:07:57PM

Subject: Noise

Comment: I attended a briefing at the Coronado Cay Homeowner Association of your plans. After looking at the new fly patterns, your new plan will cause a lot of additional noise, in an already heavy fly over zone. Please reconsider your plan and move the flight patterns out to sea as far as possible. Thank you, Jim Besikof

### E.1.11 Fred Brown

Representing: Private Individual

Organization:

Name: Fred Brown

Date: 3/25/2010 9:07:39PM

Subject: Noise

Comment: I have lived here for 17 yrs and until reasently found the Navy to be good neighbors. I appreciate the work you do and support your efforts. But.... about a month ago after your announcement of planned increases in training the air activities and noise have become overwelming to the point of intimidation. If this is a test to see how much noise we can tolerate , you have exceeded my threshold 4 weeks ago. I am very concerned that this will affect our quality of living and negatively affect our property values....Fred Brown

### E.1.12 Pat Brunson

Representing: Private Individual

Organization:

Name: Pat Brunson

Date: 3/26/2010 7:40:46PM

Subject: Birds

Comment: The noise from the helicopters is quite bad at our house but I can't imagine how all the birds in this area can take. Plus the air pollution from that pink smoke floating over the Strand can't be good for us or the wildlife.

### E.1.13 Elizabeth Butler

Representing: Private Individual

Organization:

Name: Elizabeth Butler

Date: 3/10/2010 2:03:57AM

Subject: Noise

Comment: Your system has lost two letters today....one just now. It is too late tonight to redo it. What seems to be the problem? Thank you- Liza Butler 619-405-1500

### E.1.14 Elizabeth H. Butler

Representing: Private Individual

Organization:

Name: Elizabeth H. Butler

Date: 3/30/2010 1:47:52PM

Subject: Noise

Comment: Mayor and City Council City of Coronado Coronado, California March 2, 2010 Dear Mayor Tanaka: The letter below reflects several previous attempts to address the problems caused by intensified military air training over the Silver Strand. The current level of training has seriously impacted residents and visitors since 2007. We have not received any answers to reasonable questions or been asked to participate in co-creating alternatives. There are clear alternative helicopter routes and obvious means of notification and community education that would ease of the stress we live with. Only a few weeks ago we learned that we are part of a newly named Silver Strand Training Complex (SSTC) with high intensity, high profile maneuvers planned along the length of our State designated Scenic Route 75. Many City, County, and Federal funds and tireless volunteer and staff time and multiple interagency collaboration has gone into preserving the Silver Strand's scenic views, natural resources and unparalleled recreational and residential opportunities for military and civilians alike. Similar to the goal of the National Wildlife Refuge, we thought this area would be an outdoor haven for people and families in perpetuity. The projections in the proposed EIS do not reflect an understanding of this City, State and County mission, but rather suggest a militarization of an area previously shared with residents, visitors and the natural environment. In closing this memo, I would like to emphasize one of the most troubling aspects, perhaps the most egregious aspect, of the EIS. The increase in helicopter operations from 700 to 2300 is in addition to the current daily low flying helicopters that fly back and forth over the eastern shore of the Cays, Grand Caribe, Loews, and the State Park during peak hours 3-10pm. In the summer, they can do circular patterns every four minutes, often going later in the night. Perhaps, this routine helicopter exercise is an area where we can dialogue with the navy about 'balance' and community respect for their neighbors of forty years. Thank you for considering this background. It is pasted below as well as sent in an attachment format. Liza Butler

Representing: Private Individual

Organization:

Name: Elizabeth H. Butler

Date: 3/30/2010 1:55:32PM

Subject: Noise

Comment: August 2009 Mark Ochenduszko, City Manager City of Coronado Coronado, California 92118 August 2009 Re: MILITARY TRAINING OVER THE SILVER STRAND Dear Mark, This is a friendly request for public information. It would be very helpful if you would facilitate the process of obtaining answers to the following questions: What AIR TRAINING is planned for the peak summer months July - October 2009? What part of this is 'routine' NBC practice? What constitutes 'routine' flying: what are the designated patterns or paths; what are the allowed weekday daily start and end times; are there different paths or curfews for weekends and holidays? What is the allowed or legally mandated flying height for helicopters over densely populated residential and recreational areas (i.e., how many feet above rooftops and bathers on a beach is considered safe or even 'courteous'? ). Are there safety height regulations set by the FAA and are there military exemptions? Are there other FAA regulations that say helicopters should fly a certain distance from the bay or ocean shoreline? Are the helicopters who fly round and round paths up the channels of the Cays performing a sanctioned practice? What part will be "SPECIAL" TRAINING MANEUVERS involving squadrons whose home base is located elsewhere? What are the start and end dates of the 'special' maneuvers? What time of day will they begin and end? Will the impacted time be the same for weekends as weekdays? Are major holidays included? When there are AIRSHOWS (e.g., Redbull Races, Miramar Airshow) or ceremonial demonstrations (e.g., off the Midway museum) in the San Diego area, routine military practice and/or practice for the special event are often diverted over the Cays and the Silver Strand. What is the summer/fall schedule for these activities? ***************** In the last two summers, the residents, real estate rentals, and other tourist businesses were not notified or prepared in any way for the negative impact of continuous low-flying helicopter and jet practice. This air activity is in addition to the advertising, fixed-wing planes which go back and forth above the State Beach and Park and often crisscross the Cays during summer months. The 'surprise' element of the last summers intense air activity evoked a range of negative emotions: fear from the 'high alert' noise and vibrations of helicopters; anger from having special family events and vacations ruined; and disbelief that all this was happening without notification from the City or any known public planning process. Trying to get information was difficult. People were referred to the navy control tower to make a "noise complaint" and asked to produce photographs of the plane, the number on the plane, the time and direction of the flight. The problem was not the disturbance produced by an aberrant, ill-trained, low-flying pilot. THE FEAR AND DISTURBANCE CAME FROM MILITARY TRAINING THAT COMBINED ROUTINE PRACTICE WITH INTENSIFIED SPECIAL MANEUVERS OVER A HIGH DENSITY RESIDENTIAL MARINE COMMUNICTY, ABOVE A POPULOUS STATE BEACH AND A 450 ROOM HOTEL-RESORT, SCHEDULED IN THE HOTTEST, PEAK USE SUMMER/FALL MONTHS. This inquiry is a request for information. It is also a request for some 'balance' and courtesy in the planning of training exercises. My experience with the military in recent years was that military leadership valued the commitment to be 'good neighbors' to impacted communities. Last summer, the Navy was not a good neighbor; it exploited our previous goodwill and caused us many problems. Perhaps, leadership in the military and the City have attempted to address these problems in their monthly meetings. It would be helpful to know if the environmental impacts of air training are discussed and planned for in these meetings. Thank you for your help. Respectfully, Liza Butler 13 Kingston Court East cc Loews Coronado Bay Resort Silver Strand State Park Beach

### E.1.15 Harry Butler, Ph.D.

Representing: Private Individual

Organization:

Name: Harry Butler,PHd

Date: 3/9/2010 6:30:32PM

Subject: Noise

Comment: It seems foolish to me that the Navy would jeopardize the health and welfare of local residents in order to prepare to fight those who wish to damage the health and welfare of Americans. There seems to be no recognition in the Navy's plans that piercing noise, especially helicopter noise, will cause harm to local residents including local Navy families. It isn't necessary for helicopters to fly low over homes and continuously circle over the bay, state beaches and residential communities regardless of nighttime hours, weekends and holidays. This routine practice which intensifies in the hot months is not necessary. Helicopters can fly over the ocean. The residents of South Bay have worked their entire lives in order to save sufficient money to live in this desirable community. We are hard working, patriotic, taxpaying citizens who deserve better treatment than what has been occurring over the past three years and what is being proposed now Currently, helicopter noise causes nervousness, inability to relax and loss of sleep. There is a certain arrogance in the Navy which allows these unhealthy intrusions into private living space with no notice or consideration. I beseech the Navy to do two things: 1) Give additional time to the community to comment on this plan and make carefully researched suggestions. 2) Work with the community to consider alternatives to the noise and pollution impacts of current air training as well as the other more egregious elements of the proposed plan (as highlighted in the City's response). A cooperative plan that genuinely considers human needs for health, comfort and security would be a plan that benefits military families at the same time it benefits other local families. The Navy bruised its standing and respect locally by issuing an EIS that suggested that Americans employed in the military should "sleep in their own beds" while other Americans' sleep is dispensable. Please consider our needs as one. I

## E.1.16 Cynthia Buxton

Mr. Kent Randall
Naval Facilities Engineering Command Southwest
Code: OPME
2730 McKean St. Bldg. 291
San Diego, CA 92136-5198
March 8, 2010

*Abstract and summary of the first three pages: It is not to say that there is not a win-win to what the Navy intends to do, but to impart on you in the only, and I know, lengthy way I can manage to articulate, that what you and I have here is very, very special and very unique in the weird world, -a diminishing natural world, -of Southern California. It would be honest to say that over the course of 2 decades when I was looking for the lucid and rational, and peaceful on short order, I came here.*

Dear Mr. Randall:

I am the adoptive parent of the proposed Eagle Peak Wilderness, a position that came as an outgrowth of some volunteer work documenting, leading hiking outings for the Sierra Club, and photographing the remote unseen and wild portions of San Diego Backcountry. The people who have heard me endlessly speak of the beauty of San Diego in recent years was with respect to the many waterfalls, and breathtaking vistas in our back country up in the mountains of the Julian area. I probably have thousands of pages, as well as thousands of photos, out on the net on this subject. But what most people do not know about was the life before the waterfalls.

Today I am speaking purely on behalf of my self as a homeowner in Imperial Beach, and twenty year runner/walker on the Silver Strand State Beach.

I used to live in North Park and still have a home there. My former husband is a friend, life time resident of San Diego, and grew up in La Jolla. His brother is a commander. His great uncle was a four star admiral, the late Admiral Voth. There have been many significant people in my life in the Navy at all ranks. In San Diego who couldn't say this?

A long time ago I lived a very different life in Myrtle Beach, S. C., at that time an air force base. I don't want to recount the times I almost wrecked a car from over fascination with the things flying in perfect formation above. What I will tell you is that one day, bathed in oil and sweating in the sun on the beach, I had had enough of just sitting still in pretentious tanning. I hired a baby sitter to play with my son long enough to try running. At that time I was about wiry 70 pounds less than today. The first day, pacing myself I ran from Myrtle Beach State Park to a certain large hotel in Surfside beach. I rested only momentarily and ran back. Barefooted. Within the month I was running six miles in 50 minutes two or three times a week from the state beach to what was then the Holiday Inn in Surfside Beach, and back without stopping. Barefooted. I knew very quickly what part of the sand would provide the proper cushioning (where the water meets dry sand). I probably had about 400 miles there before I moved here.

Running in that capacity is like flying. I wish I could do it now. I developed a unique, almost personified, relationship with the beach where I ran, nearly always, barefooted. There is nothing else like this. AT that time there were long sections of uninterrupted beach that had not been developed. I think there is at least one ranger at the Myrtle Beach State Park that was a bait house clerk at the time, that still remembers.

When I moved here I wanted to continue running. I ran quite a bit at what was called Blacks. This was a very interesting experience for a shy southern girl. In spite of the crazy new Californians, however, that existed on that beach, I was often uniquely the only female running, (in shorts) and barefooted. I still wanted somewhere to run that was like home. Pacific Beach came next. It was crowded, commercial, though delightful in many ways, the sand is very hard. One day I ran at Coronado. I knew I was getting warm but the parking, crowds, and even affluent neighborhood was not the relaxed escape I was searching for. When I got to Silver Strand I *was* home. I probably have well over a 1000 miles running and walking there over the next many years. Even when I was exploring the back country, a short escape was to take off for the strand, run to "tha big round thing" or on a better day to the pier to chat with someone named "Clemente", eat the best tacos this side of Ensenada, run back stopping long enough to admire the local art at the end of Palm on the children's wall and water fountain. (now relocated behind the Mexican restaurant at 3rd ave in a little mini park)

Whether the back country or at Silver Strand, one of the most difficult tasks is to define the difference between "unspoiled" and "mitigatable" or mitigated, or even urbanized to the regular guy who is content with a beach to kick back and read a paper or body surf upon. Rightfully so.

For a place that is truly untouched *there is no* Mitigation. Once you compromise on true unspoiled –off the urban-matrix this status no longer exists. It is basically the equivalent of multiplying by 0. I find that most people in the city urban environment do not thoroughly grasp what that is to be completely in a spot that is still really natural and at its mercy or better yet comfortably integrated with its natural laws. **Even more difficult is to explain why this is so coveted and desired by the people who speak up for it.**

The pristine wild is the caviar and 5 star drooled upon talked about and near worshiped of the people who go there; the medicine and meditation of water gurgling in memory for days after exposure. This one, otherwise labeled, "in town" , square, flat, smooth, pre-traversed, thoughtlessness -imposed and determined by halls, sidewalks and roads, is the fake. For what its worth, it is the knowledge of the true off the matrix world, thus far, more beautiful than a thousand star hotel, that both sustains and empowers, prevailing through the worst of social propriety, or embarrassing lack thereof. It may not be the mental status of military trained focus or hierarchical reverence, but perhaps a brief juxtapose debriefing, as scaling of diverse, and absolute self reliance, a self perspective to all else still wild in true form. What is this to a service man home from the wild of war?

The beach between the SilverStrand State Beach and "the big round thing" , I now know, thanks to this action, is called "the elephant cage" , is not quite at pure unspoiled status. However in San Diego given the nature of all of the other beaches it is absolutely remarkable. It was even voted in a poll on wild beaches, as number 7 in Southern California. (Blacks, or Torry Pines State Beach made the list at 3)

I recall fondly the effort that took place on the South Carolina beaches to reestablish dunes and a plant called sea oats, that effectively glues them together, when for a time they were taken for granted.

At a 200 or so dollar fine for picking a sea oat or two, they are no longer taken for granted. The mundane now promoted.

Here in one of the densest parts of the CON-USA lays one of the most diverse counties, species- wise, in the nation. This little treasure of dunned and relatively unspoiled isthmus, at least un-urbanized beach front for many miles ; it is the only place reminiscent of the eastern long wind swept wild beaches that seemed to stretch and dissipate almost mysteriously and magically into blue and grey salty misty sky and floating liquid sand.

The first time maybe 14 years ago I thought to jog on the fourth of July I was in for the learning of a well kept secret. Even though no parking was to be had at the State Beach, and confiscating one a serious effort in Imperial Beach, once I broke free of the crowd running north of the elephant cage, I saw on the busiest day of the year about 3 other people. That number has grown, but not much. It may stand at 2 dozen, over the course of three miles.

**It is not to say that there is not a win-win to what the Navy intends to do, but to impart on you in the only, and I know, lengthy way I can manage to articulate, that what you and I have here is very, very special and very unique in the weird world, -a diminishing natural world, -of Southern California. It would be honest to say that over the course of 2 decades when I was looking for the lucid and rational, and peaceful on short order, I came here.**

Long story short, in a year when 200,000 thousand acres of unobstructed natural beauty are being threatened in far more senseless rational, by steel and voltage, it seems as though there is no place left to un-attach and be, or whose activity isn't left personal and creative.

To my much unaware lack of newcomer saavy, my then husband and acquaintances were much surprised that I would pick, of all places, Imperial Beach as my heartthrob. They were fully integrated into the beach at La Jolla and any where else they pleased. By and large, Imperial Beach was not the social climax on the societal register with people who grew up in LaJolla. I am ok to leave it that way. San Diego is blessed with awesome public beaches. Ironically only 10 miles away, the five star Hotel Del Beach has won number one and number two beach status in the world only second by one authority travel magazine, to Poipu in Hawaii.

However none are like this one, not even close. When the opportunity presented itself, I moved in.

When I discovered the even bigger secret that we sit next door to one of only two National wildlife estuary refuges on the west coast, I knew all too well what that meant. I have a BS in Biology from a marine biology school at UNCW and did my senior honors paper research on copepods. (Diapause eggs of Anomolocera ornata *Sutcliff* , UNCW and the Student paper CANCUS for the North Carolina Achedemy of Science) I thought I would never have an opportunity to bring this chapter up from the past. Many marine critters that make an environment diverse and healthy depend on estuaries, either directly or indirectly, for their start in life. The estuary is essential to the life of the ocean near the shore. The health of what we have here if it works the same may be extremely critical because it is *all* we have. When I did plankton tows for my paper the water was teaming with copepods one week and the tiny newborn stages of many fish and crustacean species the next. We speculated then about the protection of the enormous estuaries in the Wilmington and Wrightsville Beach areas that played into the life cycle of the copepods and in turn their eventual position as food for the early days of newborn fish and crab zoea among other things.

**Does this happen at the Tijuana estuary as well?** This needs more research.

The navy , and the military in general have become very good environmental partners.

**What can the Navy do to keep the wild quality at a maximum albeit the times it is using the beach for exercises? Are there covert training maneuvers that are more subtle or invisible, and less impacting to the land? Is there a way the local public might help or become a part of the solution? What activities could be done south of the first jetty on the public beach? Could the public be involved in mock rehearsals? And thereby reduce the impacts north? Would the Navy make use of the resources at the public peer? The public could be used to identify what is effective "covert" and what isn't? Can the Navy make use of areas that are not on the beach?**

I can not know in full , nor I hope does anyone commenting that isn't in the Navy, but it would be honest to say, I do not know why after WWII, Korea, Vietnam, Desert Storm, and whatever post 911 is that now we find this expansion inescapably necessary. **What are the alternatives considered?**

The Navy is already doing a very good job. And I am very grateful.

In the last year, along with a number of hot environmental issues, Sunrise Powerlink not withstanding, I "was made aware" of the MLPA by my environment colleagues volunteering day and night to establish sustainable guidelines for our oceans. Our local coast has many impacts, not only from the Navy and tourists, but in no small way from bait fishing and other commercial endeavors. **What measures could the Navy take to help establish sustainable guidelines if they are to enter in larger capacity the current mix of impacting interest groups?** The shore birds that are often the focus of marine environmental debate and concern depend upon this zone for survival. Unfortunately because the public has taken a zesty proportion of the urban share, there are few places for the birds to nest with reliable success.

The preserve around the elephant cage happens to be one of them. The shore birds may also feed on sand crabs. **What impact does vehicle traffic have on san crabs and in turn on the shore birds that feed on them?** I think this question needs some research. I would be concerned that the traffic would reduce another food source for the birds.

I was taken back by the notion that they Navy would run through the vernal pool when it is dry. **Where do the critters go when it is dry?** It is my understanding that they are still there, just dormant. (I mentioned a paper on diapause?) Running across this area, kicking up the top soils, disturbing whatever vehicle the plants and animals and microorganisms have for staying alive suspended throughout a dry summer would be radically abused by playing and training there. **Is there someway to build a mock cover over this area to protect it? Would such a cover work?**

This vernal pool is a beach vernal pool. **Does this make it additionally rare and fragile?**

In our backcountry, our streams become corridors of algae parchment; a vehicle I propose may play a role to perpetuate the fauna that takes life when the streams are running. **Does such a vehicle exist for vernal pools? If so , and the creatures are there, buried, how will you protect them in the dry season?**

The Navy has been flying increasingly at night, and increasingly directly overhead, though since the public made considerable of it at the public forum, it may be a bit better lately. I have been nearly asleep to be awakened by the helicopters. Sometimes leaving the windows open is impossible to do. One day I came home to find that my dog had gone through, literally through, a large window out of fright from loud noises. I confirmed with the neighbors who heard the noise and the window crash. It cost hundreds and lost me thousands in down time as I had to rebuild the wall with three double pane windows and all new trim to hold them. I really had no warning or decision as to when. Several weekends were taken through the Christmas Season to finish the project.

The Ymca is far closer than my house. I know how to extrapolate the meaning of training. Children at the Y may not. Many children that attend do so on scholarship as one of the first natural experiences or experiences at a a camp they have ever had and for some ever will. The Y hosts over 10000 children every year. I know one such child, a woman now, who had difficulty learning in school. I saw many positive changes in her in the several seasons she attended this camp. She now pays her own way and holds a job with promotion and respect for several years. I think the Y played a roll in her turn around. In 1993 congressman Bilbray and Senator Boxer insured the continued existence of the Y for the next 50 years by establishing a 50 year least with the Navy. In 1998 the Navy decommissions the radar antennae, or elephant cage. I do not recall any loud noises back then. The Y Camp Surf has been in harmony with the Navy for many years prior as well.

**What can the Navy do to minimize the startling and even frightening noise around children?**

I have found on occasion, cylinders, with warnings of phosphorous. **What can the Navy do to ensure the refuse of their activities will be removed?**

I have seen whales breeching offshore during migration times. **What can the Navy do to ensure the safety and integrity of these mammals? What research and precautions can you do to protect their sonar capabilities near yours as it is vital to their survival?**

**Have you reviewed the original grant to the Navy for use at the Southern end**? I think this needs to be done.The EIS mentions a grant for the Navy when they were established there of fee simple. I have a question about this. Have you reviewed the original grant to the Navy for use just north of the Northern end of Imperial Beach. I think this needs to be done. See below an explanation from **Wikipedia on line. Fee Simple can be absolute or it can be fee simple defeasible. Fee Simple defeasible can be fee simple determinable and fee simple subject to a condition subsequent. Since the Navy suspended the use of the radar tracking and because the use by the children and family camp at the Y is well understood and established I find it hard to believe that in the establishment of the Navy grant with children present and the public walking through, that the intention was that of fee simple absolute. I especially find it difficult to believe that that intention included the sounds of bombs bursting in air, so to speak.

**Have you checked to see what the stipulation was in the grant when the radar was no longer used and what was that intention? Who provided the grant? What were its conditions?** It make more logic that the Grant with an intention of mitigating the military usage of the beach originally, would included the portions used by the Y for families. I would not be surprised If the level of review were still in place to curtail an activity or in this case "frightening" noises near the camp with fee simple subject to a condition subsequent.

**What can the Navy do to reduce the noise for training? I do understand there comes a time when training has to include operating under the startle of noise. Can this portion happen somewhere else? Can the solution integrate with the public presence as much as possible?**

* Types of fee simple http://en.wikipedia.org/wiki/Fee_simple

If previous grantors of a fee simple estate do not create any conditions for subsequent grantees to own the conveyed property in fee simple title, which is commonly the case these days, then the title is called **fee simple absolute**. Other fee simple estates in real property include **fee simple defeasible** (or **fee simple determinable**) estates. A defeasible estate is created when a grantor places a condition on a fee simple estate (in the deed). Upon the happening of a specified event, the estate may become void or subject to annulment. Two types of defeasible estates are the fee simple determinable and the fee simple subject to a condition subsequent. If the grantor uses durational language in the condition such as "to A as long as the land is used for a park" then upon the happening of the specified event, the estate will automatically terminate and revert to the grantor or the grantor's estate; this is called a fee simple determinable. If the grantor uses language such as "but if alcohol is served" then the grantor or the heirs have a right of entry, but the estate does not automatically revert to the grantor; this is a fee simple subject to a condition subsequent. In the United States many of these concepts have been modified by statute in some states. Generally speaking, fee simple determinable was preferred by courts in the Common Law of the early United States. Recently, that trend has reversed, and most courts in the United States today will find a fee simple subject to condition subsequent (instead of a fee simple determinable) in situations where the conveying document's language is unclear.

Thank you for reading a long comment letter.

Thank you for defending my right to write it!

Thank you for defending our great and beautiful country!

Thank you for working together to keep it that way!

Sincerely,

Cynthia M. Buxton

541 Spruce Street

Imperial Beach, Ca. 91932

## E.1.17 Earle Callahan

March 19, 2010

Naval Facilities Engineering Command
Attn: Mr. Kent Randall
Silver Strand Training Complex EIS
1220 Pacific Highway, Building 1, 5th Floor
San Diego, CA 92132

Dear Mr. Randall,

I am a resident of Coronado and I live at 860 Cabrillo Ave..
I have learned that the Department of the Navy is planning on increasing the levels of training at the Silver Strand Training Center. I agree entirely with the Navy plan. Their training is a necessity for the defense of the United States! Those that think otherwise should spend some time in/with the military, and see for themselves, and quit complaining. These Navy men/women training are willing to give their lives for their/your country, and do the local citizens' contributions and complaining match that? The Navy did provide for the least terns on the bay side and it is fenced off, which was Navy property.

Sincerely, Earle Callahan
Earle Callahan

### E.1.18 Earle Callahan CDR USN (Ret)

Representing: Private Individual

Organization:

Name: Earle Callahan CDR USN (Ret)

Date: 3/13/2010 5:06:44PM

Subject: Other

Comment: If anyone complains about the necessary Navy exercises on the Strand, they really must be pacifists, and unAmerican. All they can do is complain when they are living in the greatest country of the world, and probably none of them would fight and die for their country like the men/women on the ships and beaches at these exercises. They gladly prefer others to do it, so they can complain, and enjoy their good lfe in the USA. The Navy has already given lots of bay front property for the protection of the least terns, and even fenced it off. As far as water pollution,ask Tijuana to quit dumping sewage into the Tijuana River. When it rains,even the old tires and garbage ends up on U.S. beaches all the way to Coronado, when it follows the north flowing eddy currents from the south.Imperial Beach surf is always contaminated with Mexico's sewage. That is worth bitching about, and not the U.S. Navy manuevers getting ready for battle!!

### E.1.19 Benton Calmes

Representing: Private Individual

Organization:

Name: Benton Calmes

Date: 3/23/2010 6:52:35PM

Subject: Noise

Comment: Add a sensitive receptor in Imperial Beach at Oneonta Elementary School. Noise extends further south than EIS indicates. Reduce helicopter overflights in general. NO helicopter overflights over residential neighborhoods. I saw no reference to this in the EIS but it happens in Imperial Beach all the time.

### E.1.20 Ted Camaisa

Representing: Private Individual

Organization:

Name: Ted Camaisa

Date: 3/13/2010 12:25:34PM

Subject: Public Health and Safety

Comment: Amphibious landing craft training poses minimal risk to the safety of residents living on Silver Strand. However, the increase in aircraft sorties in a combat training environment poses significant risk to residents in Navy Housing and the Cays. The Navy does not need another incident where an aircraft goes down on civilian housing, when realistic training could have been held in a low risk area like Camp Pendleton. Our pilots need to focus on realistic and unencumbered combat training, without concern for endangering residential homes.

### E.1.21 Joan Cameron

Representing: Private Individual

Organization:

Name: Joan Cameron

Date: 3/8/2010 7:53:32AM

Subject: Noise

Comment: The helicopters begin practice well before the time this is written. Today I heard them by 4:30AM!

### E.1.22 JIM CAVANAUGH

Representing: Private Individual

Organization:

Name: Jim Cavanaugh

Date: 3/6/2010 6:58:34PM

Subject: Military Training Activities

Comment: This is absurd... we need our military to be first in the world... stop trying to thwart them... support them.

### E.1.23 Jennifer Chapman

Representing: Private Individual

Organization:

Name: Jennifer Chapman

Date: 3/30/2010 7:31:08PM

Subject: Noise

Comment: As a resident of IB, I appreciate the military base and what it brings to the community. That said, please consider strongly any nighttime noise (2200 to 800). I don't care about daytime noise, but anything before 8am is a concern. At night I often hear helicopter noise emanating from Navy, local police, and border patrol. I also heard substantial noise that woke me up (and I sleep tight) and kept me awake when Transformers II was filmed at the Radio premises in the southern end of the Silver Strand. Since no one told the neighbors in IB, I thought that it was related to the violence in Tijuana, or something bad happening in IB. Please remember that you are not the only group and that the effect of all the noise is cumulative, and can actually be very frightening. Please avoid all noise possible from 2200 to 800 and give IB residents advance notice if you're going to have a night where you make noise anywhere approaching the noise made during the filming of Transformers. Thank you for all you do for our country.

Representing: Private Individual

Organization:

Name: Jennifer Chapman

Date: 3/30/2010 7:31:08PM

Subject: Hazardous Materials and Waste

Comment: Please be sure to inform IB residents individually and directly (by a paper notice to each abode, for instance, not just by posting something on a website no one from IB reads regularly or posting a notice in a newspaper), if there are any Hazardous Materials or Wastes relating to this proposal known now or discovered in the future.

Representing: Private Individual

Organization:

Name: Jennifer Chapman

Date: 3/30/2010 7:31:08PM

Subject: Land Use

Comment: I like to jog on the beach side of the Silver Strand with my dog. Please ensure I continue to be able to do so! Also, I noticed the new big signs on the beach north of Palm (by the surf camp). You might think it's common sense to say people have to stay below the "mean" tidal line, but it doesn't. I assume you mean average by saying "mean," but when I'm on the beach, I only know where the tide is at that moment. It changes seasonally and daily and yearly, and can also depend on whether sand rejuvenation projects (sand dumping) happen. So please clarify whether you mean that we have to stay below where the vegetation grows, or what? Also, many hispanic-only speakers come to the beach, and if I have trouble understanding what is meant, I think non-native speakers will too.

Representing: Private Individual
Organization:
Name: Jennifer Chapman
Date: 3/30/2010 7:31:08PM
Subject: Military Training Activities
Comment: Please see my comment concerning noise.

Representing: Private Individual
Organization:
Name: Jennifer Chapman
Date: 3/30/2010 7:31:08PM
Subject: Public Health and Safety
Comment: Please see my comment concerning Hazardous Waste.

### E.1.24 Jim Clifford

Representing: Private Individual
Organization:
Name: jim clifford
Date: 3/30/2010 11:57:47PM
Subject: Military Training Activities
Comment: your program keeps erasing my comment entry before i even get 100 words on the screen - hope this isn't an indication of the Navy's true interest in feedback from the public. An important issue I don't see addressed anywhere relates to a major step the Navy took a few years ago the last time they sought public input re these beach areas - they Navy tried to close about 2 miles of beach between the ymca camp and the south end of the state beach. this area has for many years - if not since time immemorial - been open to the public and is one of few beach areas of significant length in san diego where beachgoers can walk or run with their dogs. what i saw happen was that the day the navy tried to close the beach, the public simply wouldn't stand for it and defied the orders of navy security staff on the beach and simply walked up and down the beach right past obstacles the navy tried to use to prevent the public from entering the beach. it is troubling that the navy used such poor judgment in even considering trying to close this beach to which the public has always had such a long and strong connection and that they navy either didn't think thru or actually was ok with putting their security staff in a hugely problematic position of trying to stop the public by what? - arresting or shooting decent taxpaying citizens who simply can't believe the navy would be so arrogant as to presume that there is any reason for the navy to abscond with 2 miles of beach which should remain as it always has - open to the public?! so my concern at this time is whether in the midst of this ridiculously long document describing the navy's latest project for this beach there may somehow be a hidden agenda of again trying to close the beach? if so i'm sure they navy has learned they will have to string claymores to pull it off this time and even then they may have to explain some severed body parts (human and canine) in the national news for awhile. i wish i could view the navy and dod as being sane enough that we wouldn't have to even imagine the navy trying to close this beach but based on what i saw just a few years ago i see we have to be ever vigilant for some wash dc dod bureaucrat to come up with another arrogant and brilliant idea of affronting the very public whose tax $ fund everything the dod does thru out the world. so - to wit - is the navy in any way planning to curtail any public access to any of the beach between the ymca camp and the south end of the state beach (silver strand)?

### E.1.25 Loris Cohen

Loris Cohen

Mr. Randall

NO!

On increasing training along Coronado's coastline! Unfair To Coronado & Really a bad idea.

Sincerely

Loris Cohen
60 year Resident
1099 First ST #121
Coronado
619 435-5468

### E.1.26 Mark Conrad

Representing: Private Individual
Organization:
Name: Mark Conrad
Date: 3/27/2010 3:28:19PM
Subject: Noise
Comment: The noice level of the helicopter flying up and down the bay side has increased almost every year that we have lived here over the past 10 years. Often in the summer the sound is so loud it is difficult to carry on a conversation outside. We in the Cays will now have it on both sides if this goes into effect. This is a residental community and the Navy can use camp Pendleton which has many miles of beach and without the impact of the noice to residents. This will be negative impact on all of us.

Representing: Private Individual
Organization:
Name: Mark Conrad
Date: 3/27/2010 3:28:19PM
Subject: Birds
Comment: The terns have their nest along the shore lines and you suggest in your EIS draft that it is going to have little effect on the nesting. I think the noice itself will drive the birds away. The traffic and surely destroy many of the nest.

Representing: Private Individual
Organization:
Name: Mark Conrad
Date: 3/27/2010 3:28:19PM
Subject: Fish or Fish Habitat
Comment: Grunion along this beach have been laying their eggs in great numbers. In fact at high tide and full moon the beach is crowded with many people fishing for them. The demolitions and other activities of the Navy will have negative effect of the grunion.

Representing: Private Individual
Organization:
Name: Mark Conrad
Date: 3/27/2010 3:28:19PM
Subject: Marine Plants or Animals
Comment: There are many clams along the beach and I often go out at low tide and collect the legal limit. The impact of training and traffic will have negative impact on the clams.

Representing: Private Individual
Organization:
Name: Mark Conrad
Date: 3/27/2010 3:28:19PM
Subject: Social or Economic Conditions
Comment: The noice and loss of the beach will have a negative impact upon real estate values in the area.

## E.1.27 Elizabeth Copper

Representing: Private Individual

Organization:

Name: Elizabeth Copper

Date: 3/30/2010 7:46:55PM

Subject: Birds

Comment: My comments are longer than 5000 characters. I did not find any indication of this limitation on the website until I attempted to submit my comments. I am emailing my comments to Mr. Randall and will also mail a copy of my comments which will be postmarked March 30, 2010 but clearly will not be received on this date as called for on the website. Given the length of the document and the complexity of the issues the limited comment space does not seem adequate. Thank you, Elizabeth Copper

### E.1.28 Elizabeth Copper

**Elizabeth Copper**
**Consulting Biologist**
**227 F Avenue**
**Coronado, CA 92118**
**619 435-2687**
**ecopper@san.rr.com**

Naval Facilities Engineering Command, Southwest
Attention: Mr. Kent Randall
Silver Strand Training Complex EIS
1220 Pacific Highway, Building 1, 5th Floor
San Diego, CA 92132

March 30, 2010

Re: Silver Strand Training Complex Draft Environmental Impact Statement

I attempted to submit my comments via the website and encountered the 5,000 character limitation. I am emailing my comments to Mr. Randall and will also mail a copy of my comments which will be postmarked March 30, 2010 but clearly will not be received on this date as called for on the website. Given the length of the document and the complexity of the issues the limited comment space does not seem adequate.

I do appreciate the opportunity to comment and as a contractor privileged to work with the endangered birds at Naval Base Coronado I applaud the Navy's many years of efforts on behalf of natural resources at their facilities at NBC. The military and particularly the Navy deserve the primary credit for increases in the population of the California least tern having pioneered the methods and set the standards that are now applied at successful sites throughout the range. Because of their outstanding efforts the Navy has been given significant regulatory relief to address the constraints imposed by the presence of such species as the least tern and the Western snowy plover. The benefits to the terns of this bargain and the significance of these efforts were clear in 2009, when NBC supported 22 percent of the least tern nesting attempts in California. NBC also supported the second largest population of nesting snowy plovers in Recovery Unit 6 and fledged as many young as sites with larger populations.

This Environmental Impact Statement (EIS) represents a lengthy effort to identify points of conflict between endangered species' management and Navy training and address potential resolution of those conflicts. However, the current status of the California Least Tern and the Western Snowy Plover neither of which is faring well, is not clearly portrayed in the EIS which may mislead the public regarding the potential consequences of the proposed actions.

Since 2001, Least Tern reproductive success in San Diego County has been declining with the steepest drops being seen at sites around San Diego Bay. This downward population trend is not addressed in the EIS. Methods for calculating population figures are under review and are relevant to providing a clear picture of the status of the species prior to approval of increased adverse effects. In 2009, only 72 young least terns fledged from Naval Base Coronado sites from 3,232 eggs laid and 2,364 chicks hatched. The losses are in no way attributable to the Navy, which has been diligent in attempting to reduce the predation that is the primary cause of these losses but it is nonetheless in this context that increased take is being sought by the Navy. It is NBC's 22 percent of the statewide population that suffered near complete reproductive failure in 2009. Both the increasing reliance on NBC and San Diego County military facilities to support the tern population and the declining populations at these sites suggests a need for the most diligent evaluation of projects that may adversely affect these birds.

In 2009, NBC supported almost one third of the snowy plover nesting population in San Diego County. Unfortunately, while the population numbers have wavered , breeding bird survey results in 2009 showed the entire coastal population to be down by 12 percent from what was recorded in 2005 despite aggressive management efforts throughout the range. The minimum number of pairs at NBC in 2009 was only 35. In addition to problems of predation and habitat loss, in San Diego there has been a continuing occurrence of unexplained adult mortality with 15 adults found sick or dead at NBC in 2009 alone. This gloomy context needs to be clearly provided in the EIS to enable the public to evaluate the potential consequences of project approval.

The absence of the Biological Opinion (BO), the U.S. Fish and Wildlife Service's review and response to the proposed actions, from this Draft EIS fatally handicaps the ability of the public to review the consequences of the proposed actions. The discussion of the complexity of the endangered species issues, e.g., downward population trends, plover adult mortality, unresolved predator issues, variation in management approaches, lack of control of public access, and perhaps most importantly the take allowances, reasonable and prudent alternatives and terms and conditions that will be applied to minimize loss, is accessible only in the Biological Opinion. I do not believe the public can adequately evaluate the impacts of the proposed alternatives until that BO is included. The 30-day time period between circulation of the Final EIS and publication of the Record of Decision would be inadequate to review the relationship between the Biological Opinion and the proposed actions and therefore the EIS should be re-circulated as a Draft including the Biological Opinion.

Knowing how dramatically the nest numbers of the terns on the beach increased at NAB Ocean, I can understand that someone unfamiliar with plover biology might be fearful of the same kind of problem arising with the plovers. However, their nesting strategies are completely different. Neither snowy plovers nor any of their relatives nest in dense colonies anywhere in the world.

The snowy plover population in Recovery Unit 6 is unstable, has not met the Recovery Unit goals, and needs more aggressive management not less. The call for a cap on the number of plover nests to be protected is seemingly contrary to the mandate to recover this species. The justification offered for the cap suggests a misunderstanding of how plover nests are protected and does not take advantage of other opportunities to support training and minimize take. In 2.1.3.7. in the discussion of the proposed cap, protecting no more than 22 simultaneously active plover nests in SSTC-S and N combined, is identified as the only way to prevent the presence of protected plover nests from rendering the beach lanes unusable. This is apparently based on some assumptions which are not correct or are not likely to occur. While the worst-case scenario could occur in which three plover nests would be established in a line at the crest 30m apart, this would not result in establishment of protected areas that would preclude the use of a beach lane. The size and configuration of the buffers provided for the plover nests is <u>not to exceed</u> 30m on a side but is often much smaller and nest marking has always been done to satisfy both the protective needs of the plovers and to accommodate training activities. The presence of 3 simultaneously active nests in the training lanes occurred twice in 2009 once in Yellow 2 and once in Red 1, the most heavily used training beaches at NAB Ocean. The calculation that 22 simultaneous nests would equal 2 nests per training lane is somewhat misleading as plover nests have historically been established in 9 of the 10 beach lanes at NAB Ocean and five of six beach lanes at NRRF (4 of them are training lanes) = ~1.67 nests per lane.

The provision of protected beach lanes has resulted in a clear concentration of plover nests in the protected lanes with 60 percent of the nests at NAB Ocean being established in those protected areas in 2009, achieving the goal of minimizing the effects of plovers on training and maximizing their nesting potential. Adding training in the protected lanes and removing the protective markers may disperse what nests are established into fully active training lanes and increase the likelihood of plover loss while decreasing the protection provided. The creation of the protected areas was a minimization measure which was successful but removal of protection should require more mitigation not lessen the existing protection with a cap. Without the Biological Opinion it is not possible to know how FWS has viewed this adverse result, what additional take would be allowed, how the allowance is justified, and what compensation is required to mitigate for the increased vulnerability.

The concern that two active nests would significantly impede training is belied by the fact that throughout the season in 2009, in many weeks, three of the training lanes at a time supported two active plover nests each. The calculation that 2 nests would obstruct 12 percent of a lane is also misleading. While 60m is approximately 12% of the length of a lane, even if the nests were lined up in a way that resulted in a 60m long line the actual acreage of the area protected by maximum buffers provided for two nests is only 0.4 acres (30mx30m square) – only 3 percent of the acreage of the smallest training lane.

The protected beach lanes offer a benefit in concentrating plover nesting and tern nesting contributing to a reduction in the number of nests in the regularly used training lanes and the potential for interference with training. Nesting density was higher in the protected beach lanes (8, 9, and 10) with a maximum of 5 simultaneous active plover nests occurring in a single lane at one time. Even with 5 simultaneous active nests protected by the maximum 30m square buffers the smallest beach lane would have no more than 8 percent of the lane lost to the protected plovers.

Even with 22 nests, simultaneously active, in beach training lanes with each given the maximum 30m square the acreage removed from training availability would be less than 4.4 acres of the 191+ acres available (128 – NAB Ocean; 63.9 – SSTCS). If all 22 simultaneously active nests were established only at NAB Ocean, using the maximum buffer they would occupy 3 percent of the training lane acreage. If the number of simultaneously active nests were doubled to 44 but the buffer was halved the area occupied between SSTCS and SSTCN would still be only 2 percent of the beach. This is but one minimization measure that might be recommended if needed. Again, the absence of the Biological Opinion does not allow the public to evaluate the consequence of the proposed actions.

Knowing how dramatically the nest numbers of the terns on the beach at NAB increased, I can understand that someone unfamiliar with plover biology might be fearful of the same kind of problem arising with the snowy plovers. However, their nesting strategies are completely different. This is not a species that ever nests in large or dense colonies. Even the current density found at NBC is exceptional. The differences cannot be emphasized enough and the their requirements for recovery are not currently being met.

There is not adequate compensation identified for increased losses of terns and plovers that may occur as a result of heightened training tempo in what are the most concentrated nesting areas, The lack of adequate compensation is of particular concern in light of the continued reproductive failures at these sites for the last eight years.

The level of unrestricted public use of all the training areas is not accurately portrayed with the beaches at NAB Ocean being described as closed to the public so that the effect of the removal of protective markers in the southern lanes would not be significant. The beaches at NAB Ocean are used constantly by the public coming both from Coronado and from Silver Strand State Beach as well as by people from nearby military housing. The NAB beach has been identified on the Park website as a recommended walk from the adjacent State Park. Despite military presence, suspected vandalism of snowy plover nests and take of snowy plover chicks has been documented at NRRF. Vandalism of Navy property in the training lanes is also a regular occurrence. Off-leash dogs are constantly present at NRRF. The signs providing rules and identifying training areas are few, many of them have fallen down, some are covered with graffiti, and all are ignored. There is currently little to no enforcement by military personnel of restrictions on recreational activity. The ability to control public recreational activity is critical to any successful resources program regardless of the project alternative approved.

The Delta beaches which are mitigation for the loss of least tern nesting habitat at Naval Air Station North Island need to be evaluated for the presence of contaminants. The sites are subject to management constraints based on the presence of ordnance and have not been evaluated for contaminants. The presence of the former argues strongly for evaluation of the latter. Future clean-up of ordnance may affect the availability of these sites. As the Delta beaches are the fallback nesting location for terns and plovers displaced by increased training at SSTC the quality of the sites should be assured.

I applaud the efforts the Navy has expended in its management of endangered species at NBC and it is the Navy's demonstrated ability to support both training and natural resources that has set the standard for resource management for much of the country.

Sincerely,

Elizabeth Copper

### E.1.29 Shannon and William Davis

Mar. 5, 2010

Mr. Kent Randall, Dept. of Navy
Naval Facilities Engineering Command South West – Code OPME

2730 McKean St., Bldg. 291
San Diego, CA 92136-5198

Re: Silver Strand Training Complex Draft EIS

Training at the expense of endangered species is our concern. Endangered species are to be restored to a point that they are removed from the federal list.

We are opposed to the training activities, if you won't put protective fencing around each Endangered San Diego Fairy Shrimp's Vernal Pool habitat complex at the Navy Silver Strand Training Complex. Without fencing, foot traffic, military dogs, and vehicles may irrevocably destroy, by crushing impacts, the cysts, eggs of the San Diego Fairy Shrimp in dry season. While the EIS states it will try to avoid the vernal pools when they are wet, it clearly states that it expects there to be foot traffic in dry season.

The Navy is committed to complying with all applicable federal law, regulations and policies. Current management of vernal pools restricts all activities from the pools at all times. Environmental programs and policies have been developed to protect and improve air, water, and land, cultural resources, and national resources. The protection of natural and cultural resources has become an integral part of planning for training on S.S.T.C. However, the protected sanctuary of the vernal pools is about to change for the worse from foot traffic, other traffic, pyrotechnic chemicals, and hydrocarbon residue from overhead aircraft. Chemicals introduce poisons into the pools. Hydrocarbons cover the surface of the water and restrict oxygen from the air reaching the water in the pools. Over time, the cumulative effect leads to destroying the ecological habitat of the vernal pool.

The San Diego Fairy Shrimp ( Branchinecta sandiegonensis ), species code K049 101, has been designated an endangered species in 1993 by the federal Environmental Protection Act of 1973.

Why not designate 6 acres as a fairy shrimp pool complex preserve as the pools are separated on the order of meters? Currently, it looks like there are three complexes of pools at S.S.T.C.-S . In that the antenna array is no longer being used, which has a diameter of approximately 944 feet, that has an existing perimeter fence around this antenna array, which occupies an area of approximately 16 acres and could add 10 new available acres for training and set aside 6 new available acres for the fairy shrimp pool preserve. Figure 3.11-4 ( Ephermeral Pools ) shows the occupied pools have an area of 4.65 acres. Training could use the area between the pool complexes, but not through the pool complexes.

History has recorded the steady decline of the San Diego Fairy Shrimp vernal pools. These pools have existed for thousand of years. The major decline started in the 1940 to 1950 time period because of World War II. Additional decline occurred between 1979 and 1986 from urban development.
Before development there was approximately 28,500 acres of vernal pool habitat in San Diego County.

By 1986, only 7% of those acres remained. On February 3, 1997 it was reported that 70% of the remaining vernal pools were on N.A.S. Miramar or Camp Pendleton. By 1995 95% of the vernal pools were destroyed. In 2001 it was reported that 2,400 vernal pools existed. Between 2002 and 2003 only 3% of the vernal pools remain. In 2002, under President George W. Bush, a federal judge invalidated the critical habitat for the San Diego Fairy Shrimp. In 2009 President Barack Obama went to the National Environmental Protection Agency and ordered that all the protections of the endangered species that had been dismantled during the Bush era be put back which reestablished the critical habitat for the San Diego Fairy Shrimp.

So, the pools are down to 3% remaining. Most (70%) are on government property. Some of the pools do not have the San Diego Ferry Shrimp which makes the pools that do have, become more significant in importance. Development was the main cause of the decline in the pools. Now the Navy wants to develop S.S.T.C. – S which will further the decline of the pools if not protected as a fenced pool complex preserve.

We are patriotic and want our service men and women to have the best training. They deserve nothing less. Détente, the easing of strained relations, also applies to nature. A constant vigil of good stewardship needs to be kept for the endangered species to get off of the federal list. Thank you for considering our comments on this important matter.

Respectfully, Shannon and William Davis

Mail to 1185 East Lane, Imperial Beach, CA 91932-3227

### E.1.30 Ed Degenhart

Representing: Private Individual

Organization:

Name: Ed Degenhart

Date: 3/12/2010 9:48:19PM

Subject: Other

Comment: I live just up the street from the helicopter base in Imperial Beach and have acclimated to the touch and go operations there for the past 20 years with no incidents or harm to the environment. I have no issue with the proposed increase in training and trust the US Navy to protect our environment and community's health and safety. I also respect the will of the Naval leadership to get their people the highest and best training for their call to service by our government. Anyone who is willing to risk their lives for our country has my total commitment and support to be properly trained to perform their duty. May God Bless our Servicemen and thank you for your service to our country Sincerly, Ed Degenhart

### E.1.31 William Dick

Representing: Private Individual

Organization:

Name: William Dick

Date: 3/6/2010 10:22:16AM

Subject: Land Use

Comment: I have no problems with the Navy increasing the frequency of excercises on the Strand. My condominum is right above the SEAL compound and I have a direct view of activities to the south and west. I fully support all military activities on the Strand. I am never bothered by the military excercises and the Navy seems to be very responsible by minimizing noise when holding night activities. The Navy and the SEAL teams are part of my commmunity and make living at Coronado Shores that much more exciting and enjoyable!! I love them.

### E.1.32 Bill Dimmock

Representing: Private Individual

Organization:

Name: Bill Dimmock

Date: 3/9/2010 8:35:43PM

Subject: Noise

Comment: Imperial Beach is a very quiet and peaceful community. We enjoy the quiet of the evenings and walks along the beach. We feel that this training facility has and will interupt the peacfulness of our nights and our use of the beach. I understand the need for training, but feel that Imperial Beach is such a family area that training needs to be moved to a less populous area that would not limit the training times and days that are required to create the perfect military personel. There must be balance and we have lived in, although not perfect, balance with the military for over 20 years. Extended training hours and area would not only affect the harmony we have acheived it would destroy the quality of family life in Imperial Beach. Please consider the option that allows us to continue as is.

## E.1.33 Cheryl Dimmock

Representing: Private Individual

Organization:

Name: Cheryl Dimmock

Date: 3/9/2010 8:47:27PM

Subject: Other

Comment: We bought our home in Imperial Beach over 20 years ago. Although we could have moved anywhere, we chose this special area to raise our children. We felt at that time that there was no where on earth that offered all the advantages that were offered here. We knew that IB had a questionable reputation and that we would be sharing our area with a strong military presence, but these were small prices to pay to live in such a diversified area. Not only culturally, but biologically. The mornings spent on the beach, watching the seals and porposises. The afternoons spent over by the bay observing sea birds and turtles. The times we watched the military training were all special times of great education for my children. The best scenario would be for the Navy to find another location and allow the area to go back to a natural and untouched state. We need to protect all the environment from human encrouchment and no where in the state do we have such a fragile area as we have been entrusted with here in Imperial Beach. Since, I know that this possibility is just a dream, please consider the option of keeping the training and land use as you have been doing and not extending the hours and amount of use here. There are schools and children and real people who need to continue with their lives, without having to be stressed over the noise, additional traffic, diminished access to the beach and the possibility that all the wildlife that is habitating and at this point thriving, will be affected by our careless use of what is an area of such living beauty. We need to consider other options. The decision to add addtional training here would diminish our quality of life and what price is the Navy willing to pay for that.

## E.1.34 William Dorr

Representing: Private Individual

Organization:

Name: William Dorr

Date: 3/9/2010 9:03:36PM

Subject: Public Health and Safety

Comment: My concerns deal with the new use of Training Lanes 11 through 14, currently referred to by the Navy as SSTC-South. Let's be clear, until approx. 2 years ago, the Navy did not use this section for assault / beach access training or helicopter sortes. Now it's called SSTC-South? When did that happen? This half-moon shaped piece of land is bordered on one side by the ocean. The other side is surrounded literally by YMCA Camp Surf, which is attended by over 10,000 local children annually; Westview Elementary School, Imperial Beach; Over 500 private homwowners in Imperial beach; San Diego Bay National Wildlife Refuge; Coronado Cays, a residential community of 1200 homes, Silver Strand State Beach Park used by over 1 million people a year; Loew's Coronado Hotel, which adds tremendously to the local economy and tax base and finally Camp Able, which serves Handicapped and challenged children and adults from throughout the southern CA area. SSTC-North and SSTC-South are separated on the ocean side of the strand by the CA Silver Strand State Beach Park. To have 2200 helicopter sortes and assault and beach access training, including the discharge of munitions will harm the area marked SSTC-South and have a very negative environmental impact on the surrounding community. If this is to be used for training, it should be very low impact and classroom type training. Confine the assault and sorte exercises to SSTC North, Lanes 1 to 10, where it has always been. The noise, pollutants, increased traffic and air quality will be harmed further in an area historically used for outdoor activities and wildlife sanctuary. The SSTC-South did not exist 2 years ago. That area has always been the antenna site. Nothing could have less of an impact on the area than an antenna site. To now convert it to overt and dnagerous training and use the argument that the community should expect it is ridiculous. The helicopter traffic alone poses a huge potential for disaster to surrounding community sites that I just listed. The nosie is well above what is has been historically. The Navy has let helicopters fly throughout the south bay area not heeding to the restricted flight corridors or following the agreed upon protocol. The ocean corrifor is never used. To now triple the helicopter flights from 770 to 2200 a year and add the assault training at SSTC-South in the middle of residential locales, all less than 1/2 mile away is putting the public in danger unnecessarily. Continue to train in Lanes 1 to 10 and leave the antenna site, Lanes 11 to 14 for non-invasive, non-polluting activities.

## E.1.35 Douglas Dribben

Representing: Private Individual

Organization:

Name: douglas dribben

Date: 3/6/2010 1:17:22PM

Subject: Military Training Activities

Comment: As a frequent tourist to Coronado, I especially enjoy seeing the Seals, the helicopters, and the ships offshore in exerciises. This shows me where my defense tax dollars are going, and makes me proud to be an American. I salute the men of the Seal Teams and those men and women who support them, and encourage more exercises. The exercises do not damage the enviironment, and sharpen our defense capabilities. Do not think for one minute that they are not under observation by those who may be on the receiving end of the exercises one day, so they act as a wonderful deterrent to those who would do America harm. Please allow the Seals to expand their exercises as they desire.

## E.1.36 Beverley Dyer

March 6,2010

Naval Facilities Engineering Command, Southwest
Attn: Mr. Kent Randall-Silver Strand Training Complex EIS
1220 Pacific Highway, Building l, 5th Floor
San Diego, Ca 92132

It was a shock on February 23rd to read in the San Diego Union of the Navy plans to increase the training along the Coronado coastline many times over the previous use. Even though I have lived in my home in Coronado Cays for over 30 years, never have we been contacted nor informed of this plan which has been studied for 10 years. Now we are allowed only two weeks to make any comment.

Since there have been no public nor individual contacts previously made with the local population during your Environmental Impact study few, if any, of the local population were aware of these drastic changes. The noise of helicopters and other aircraft, besides leaving an oily residue are already a hindrance without your increasing it three-fold. Blasts of gunfire and detonation already awaken us, create a dangerous odor. You expect that humans and all living creatures will not be affected by an increase of 10 times?

It was totally unethical and unprincipled for our government supported Navy to inhibit us from previous information. Why didn't the study include the many people who live on the Strand, the hotels, the many guests and tourists and campers who spend time in the area? Were the various organizations that sponsor beach activities informed and questioned? In which way was the human factor studied? We would like an answer.

At the poorly attended Coronado meeting at the Coronado Recreation Center on February 25 it was obvious that few people knew anything about your plans even though Environmental Impact report had begun 10 years ago.

Unfortunately, the public has only been given until March 9th to make comments concerning this issue. Is that fair?

Sincerely,
Beverley Dyer
Beverley Dyer
93 Trinidad
Coronado,ca

## E.1.37 Marilyn G. Field

MARILYN G. FIELD
1101 FIRST STREET, APT. 208
CORONADO, CA 92118
(619) 437-6553
mfield1@san.rr.com

March 6, 2010

Naval Facilities Engineering Command, Southwest
ATTN: Mr. Kent Randall - Silver Strand Training Complex EIS
1220 Pacific Highway, Building 1, 5th Floor
San Diego, CA 92132

Mr.Randall:

I am writitng with comments on the Navy's proposed expansion of training activities on the Silver Strand:

1) The Navy should not be increasing its operations on Coronado. Coronado is a small residential community which is already impacted by Navy traffic , noise and pollution. This has greatly increased with the nuclear aircraft carrier homeporting operations about 10 years ago. It is inappropriate to increase the burden on this small community when the Navy has other sites which might be used for training which do not burden any community - Camp Pendleton springs to mind and there are other sites as well. It may not be quite as convenient but it is unfair to ruin a small community in the name of Navy convenience, not necessity.

2) NEPA requires that all impacts related to a proposed course of action be analyzed in the EIS. However, the Navy has deferred analysis of the impacts from helicopter trips to and from the training areas. I believe this violates NEPA.)

3) Helicopter sorties will increase by about 300%. If helicopters and fixed wing aircraft take off from North Island and transit to the training sites on the Silver Strand they should be required to fly over the ocean at a sufficient distance from land so as not to disturb residents on the ocean side of Coronado. No aircraft should be permitted to fly to or from the training areas over the Bay. Residents along the Bay are already impacted by Navy helicopter noise. The Bay is so narrow that it is not possible for aircraft to fly far enough away from residences to eliminate or minimize noise.

4) The EIS describes the folllowing activites: triple the helicopter sorties, new (presumably larger) helicopters and amphibious craft, pyrotechnics, pile driving, nighttime helicopter hovering for 1- 2 hours, 50% increase in training incidences, almost tenfold increase in firearm firings and admits there may be sleep disturbances and communications disruptions. Yet the EIS concludes that there will not be sigificant noise increase because the training is dispersed over a larger area. On this basis, no mitigation is proposed. It is not credible that these activities will not cause significant noise increases to the residents of adjacent areas. These disturbances cannot be mitigated and therefore should not be permitted.

5) The EIS notes that berms will be built in places along the Strand. This will effectively wall off the view of the ocean which residents and tourits enjoy.

6) The new and expanded training activities and the construction activites noted (including retail, recreational, housing and restaurant facilities) will increase traffic which is already greatly overburdening Coronado. There is no good solution to mitigate traffic and the Navy has been unwilling to contemplate any solutions which would significantly reduce the Navy's traffic . No activities which increase Coronado traffic should be permitted.

Respectfully submitted,

Marilyn Y. Field

### E.1.38 Marilyn Field

Representing: Private Individual

Organization:

Name: marilyn field

Date: 3/6/2010 12:14:12AM

Subject: Military Training Activities

Comment: The Navy should not be increasing its operations on Coronado: Coronado is a small residential community which is already being severely impacted by the Navy's operations. Coronado and the Navy share this small island but the Navy's increase in operations over the past 10-15 years has created noise, increased traffic and air pollution. It is inappropriate to increase the burden on this small community - in essence ruin with further increases in noise, traffic, air pollution and adverse visual impacts when the Navy has other options for training which would not burden any community- Camp Pendleton springs to mind. It may not be as convenient but it is unfair to ruin a small community in the name of Navy convenience.

## E.1.39 William S. Field

# Department of the Navy
## Silver Strand Training Complex
## Draft Environmental Impact Statement

### Public Hearing Comment Form

**Location:** ____________________ **Date:** ____________________

**Thank you for providing comments on the U.S. Navy's Silver Strand Training Complex Draft Environmental Impact Statement (EIS).** Please provide comments no later than March 9, 2010. Comments may be submitted at the meeting, by visiting the project Web site at www.silverstrandtrainingcomplexeis.com, or via U.S. Postal Service to the address below.

Helicopter noise on San Diego Bay is already a major annoyance, especially in the summer. The ramp up in training on the Silver Strand will increase dramatically helicopter flights (up to 3x I am told), including flights from new helicopters to be stationed at North Island.

We live on the Bay in Coronado (Coronado Point). Any significant increase in helicopter traffic over the Bay will make living there intolerable. In part this is because Navy pilots fly at less than 500 feet most of the time, but even at higher elevations the noise is a nuisance.

At the meeting I was told that helicopter traffic patterns are not included in the EIS. This appears to be a violation of NEPA, which requires the total impacts of any project be included in an EIS.

***Please Print***

1. Name William S. Field
2. Address 1101 First St #208
   Coronado, CA 92118

1. Please check here ☐ if you would like to be on the mailing list.
2. Please check here ☐ if you would like your name/address kept private.

Please give this form to one of the U.S. Navy representatives, place in the drop box, or mail by March 9, 2010 to:

**Naval Facilities Engineering Command, Southwest**
**ATTN: Mr. Kent Randall - Silver Strand Training Complex EIS**
**1220 Pacific Highway, Building 1, 5th Floor**
**San Diego, CA 92132**

## E.1.40 Gregory Fischer

Representing: Private Individual

Organization:

Name: Gregory Fischer

Date: 3/5/2010 3:05:59PM

Subject: Noise

Comment: As a resident of Imperial Beach for 18 years, I have a few comments. The east view from my residence on Seacoast Drive looks down the center line of the Navy's OLF runway approximately 1/2 mile away. There are helicopters conducting flight operations on most days. The noise is not at all a problem. What I hear is the sound of freedom. I truly want these pilots and air crew to be as proficient as possible in defense of our country. As for the Silver Strand Training Complex, I want our Navy SEALS to conduct as much training as they need, no matter the noise,in the proximity of their base along the Silver Strand, recognizing their importance and vital mission for our defense. No bird, fish, ground cover or sensitive ear should have a higher priority over the vital training of our Navy SEALS. Thank you for the opportunity to comment.

## E.1.41 Vincent J. Flynn, M.D.

Mr. Kent Randall
Sliver Strand Training Complex EIS
Naval Facilities Engineering Command Southwest
1220 Pacific Highway
Building 1, 5th Floor
San Diego, CA 92132. Dear Mr. Randall: This is in regard to the Silver Strand Traning Area the navy proposes to expand. I am a native of Coronado and have watched the navy's activities all my life in and around the Silver Strand. For the most part, they have taken good care of the natural resorces in the area and I have no complaints. But I must object to the increased activity in and around the old Fort Emory, the area just north of Imperial Beach. Much has changed since WWII when that area was so very important to national security. It has been repopulated with the wild species that were there 100 years ago, they have reclaimed it for their own. In my opinion, it would do much harm to the environment to reclaim this area for navy purposes. The navy should leave it alone and allow the public access to the beach area. There is still alot of beach area available to the navy at North Island and Camp Pendleton. Give the citizens a break and do not extend your already large claim on the small area of Coronado. Sincerely, Vincent J. Flynn,MD 1021 Adella Ave. Coronado, CA 92118

### E.1.42 Jeffrey G. Foster

**Department of the Navy**
**Silver Strand Training Complex**
**Draft Environmental Impact Statement**

**Public Hearing Comment Form**

shotgun blasts
FR 136
to 1450
Helo Sorties
FR 778
to 2220

**Location:** Imperial Beach **Date:** 2/23/10

**Thank you for providing comments on the U.S. Navy's Silver Strand Training Complex Draft Environmental Impact Statement (EIS).** Please provide comments no later than March 9, 2010. Comments may be submitted at the meeting, by visiting the project Web site at www.silverstrandtrainingcomplexeis.com, or via U.S. Postal ~~Service to the~~ address below.

18% increase in Sound-generating activities

The projected increase in activities could ~~create~~ cause a noticable difference in the peacefulness of north I.B. Please choose the No-action alternative and maintain current level of activities. IB residents should be considered first and foremost in making this decision as we will be the most impacted.

Beach access and the bird life along the Silver Strand are also coveted and are part of what make this a special place. Please leave the current situation as-is.

Choose the No-action alternative and do the extra training elsewhere where the public will not be as impacted.

***Please Print***

1. Name Jeffrey G. Foster
2. Address 674 Cherry Ave
   Imperial Beach, CA 91932

1. Please check here ☐ if you would like to be on the mailing list.
2. Please check here ☐ if you would like your name/address kept private.

Please give this form to one of the U.S. Navy representatives, place in the drop box, or mail by March 9, 2010 to:

**Naval Facilities Engineering Command, Southwest**
**ATTN: Mr. Kent Randall - Silver Strand Training Complex EIS**
**1220 Pacific Highway, Building 1, 5th Floor**
**San Diego, CA 92132**

### E.1.43 Frank Gaines

Representing: Private Individual

Organization:

Name: Frank Gaines

Date: 3/12/2010 10:05:59PM

Subject: Land Use

Comment: the need has long been established as has the wise stewardship of our military on the lands needed. I totally support the request and the uses identified. Frank Gaines

### E.1.44 Gerd Geissler

Representing: Private Individual

Organization:

Name: Gerd Geissler

Date: 3/30/2010 9:57:24PM

Subject: Noise

Comment: Having lived in Imperial Beach next to the Naval Antennae for over 40 years we are familiar with Naval Warfare training (which has only increased in recent years). We have not complaned one bit about the noise at night (bomb blasts and machine gun fire) nor the increased helicopter traffic OVER our houses. Now you are telling us we will not only have this noise continue but it will be for longer hours and be even more disruptive to our once quiet neighborhood? The helipcopter take offs and landings echo off the walls as it is and you want to do hundreds more? We are living in this community and we respect the Navy but feel that they do not respect us back. We deserve peace and quiet. The noise concerns we have are real and I don't think any of you would want to relocate your beautiful home to right across from a loud, disruptive training facility so why are you making us do that? You already take half the Strand for your training--leave us to our peaceful part down in Imperial Beach.

### E.1.45 Gerd Geissler

We are on Silver Strand and Carnation. The traffic goes directly in front of our lot. We are concerned about excessive speed and traffic backing up along Silver Strand. We would like to recommend that the northerly gate be used for access into the base. We would also recommend considering a light at Silver Strand and Palm Ave. Speed limit needs to posted. Also concerned about noise levels after 10 pm.

### E.1.46 Lilo Geissler

Representing: Private Individual

Organization:

Name: Lilo Geissler

Date: 3/30/2010 10:06:35PM

Subject: Traffic or Transportation

Comment: We live along Silver Strand Boulevard and have had to contend with traffic going in and out of the Naval base at all hours. The people who are driving take no heed to the fact that this is a residential area and should be driven at under 25 mph. They speed out of the base at about 40-50 mph putting chidren and pets at risk. Now you say you want to increase training which would in turn increase the number of cars using Silver Strand Blvd. as their route? Why should we have to put up with the dangerous conditions these cars pose? Why do we have to fear an accident will occur when these hazardous drivers are speeding along our negihborhood roads? We do not want the heavy traffic congestion along our peaceful street and we do not want the added pollution associated with so many extra cars. Why not open the gate along the Silver Strand (after the berm) and make that available if you are to continue with more traning excercises? Our neighborhood was not built to be a thoroughfare for large amounts of cars and we don't like the dangers they would bring.

### E.1.47 Dani S. Grady and Ralph J. Greenspan, Ph.D.

1020 Glorietta Blvd.
Coronado, CA 92118
March 9, 2010

Dear Mayor Tanaka and Council,

We are writing to express our serious concern and opposition to the Navy's planned expansion of military exercises on The Strand. There are several reasons for our opposition: human health, environmental concerns, impact on residential atmosphere, and impact on the local economy.

Our family is proud of the Navy and strongly supportive and proud of our military, and we understand the need for expanded military training. The eldest son in a Coronado family with whom we are very close is currently in the Navy Seal training program, and so we have an additional personal connection with the need for the best training possible. Over the past few years, the level of military exercises in Coronado has been increasing in both frequency and intensity. It is plainly audible from our home on Glorietta Blvd. Thus, we have been patient with the expanded use of these training areas, but now feel that the noise levels we currently experience are near the tolerable limit. We feel strongly that the place to expand such operations, however, is not Coronado, but the Navy's more isolated sites at Camp Pendleton and at the offshore islands.

The noise we experience at our home, however, is not the only reason for our concern. There are many more:

Human health – One of the principal consequences of expanded war exercises on The Strand would be noise pollution, which is well documented to cause hypertension, high stress levels, tinnitus, hearing loss, sleep disturbances, and harmful emotional effects. The radius affected by this noise pollution extends well beyond the area immediately adjacent to the site, given the magnitude of the noise and the efficiency with which sound travels over water, thus exposing the entire southern half of Coronado.

Another major effect would be air and water borne pollutants, toxic debris, and shoreline contamination from toxic chemicals that are carried in or produced by exploded ordinance. These include toxins and carcinogens such as depleted uranium, mercury, and lead, as well as irritants and irritant producers such as titanium tetrachloride, red and white phosphorus. This is to name just a few of the ordinance-associated chemicals known to be harmful to humans.

Loss of residential atmosphere – We have just spent several years instituting a new revision of zoning requirements based on the widespread sentiment that Coronado residents wanted to preserve their village atmosphere. Nothing will destroy that atmosphere more quickly or thoroughly than the frequent and continual sounds and smells of war exercises.

Our troops are crucial to our safety and we support them, their training, and their families. Many of them and their families also live here in Coronado. Proper support requires that we provide appropriate separation between domestic living arrangements and war simulations. This is especially relevant given the widespread occurrence of PTSD and related disorders in returning service personnel.

Ecological impact – The Navy's own Environmental Impact Statement[1] acknowledges that there will be a significant impact on marine ecology, including bioaccumulation of chemicals in the food chain, death from exposure to toxic chemicals and bomb blasts. In addition to direct physical harm, there is also the impact of noise on animal life in the reduction of usable habitat, which in the case of endangered species hastens the path towards extinction. The Navy's training use of sonar has already increased the deleterious exposure of marine mammals, and this expansion will further increase the burden of noise pollution on them.

Local Economy – The Hotel Del is Coronado's major tourist destination, and it sits adjacent to the area where these exercises would be increased. The noise and smell from these activities would effectively ruin anyone's stay at the hotel, or at any of the nearby hotels. The repercussions for Coronado's standing as one of America's most desirable tourist and vacation destinations would be rapid and detrimental, and this would be felt as a permanent blow to the local economy and tax base.

In short, we feel strongly that the proposed increase of Navy exercises on The Strand would be certain to have severe and long-term detrimental effects on the quality of life in Coronado, lasting well beyond the period of time in which the exercises actually occur. For this reason, we urge the City Council and Mayor to take a strong stand against such expansion of activities.

Sincerely,

Dani S. Grady

Ralph J. Greenspan, Ph.D.

[1] http://silverstrandtrainingcomplexeis.com/Documents/Silver_Strand_Draft_EIS[1].pdf

## E.1.48 Ralph Greenspan

Representing: Private Individual
Organization:
Name: Ralph Greenspan
Date: 3/10/2010 10:19:58AM
Subject: Military Training Activities
Comment: My wife and I are writing to express our serious concern and opposition to the Navy's expansion of military exercises in Coronado. Our reasons include: human health, environmental concerns, impact on residential atmosphere, and impact on the local economy. Our family is proud of the Navy and strongly supportive of our militlary, and we understand the need for expanded military training. Over the past few years, the level of war training exercises in Coronado has been increasing in both frequency and intensity. It is plainly audible from our home on Glorietta Blvd. We have been understanding of it up to now, but the noise levels we are experiencing currently are near the tolerable limit. We feel strongly that the place to expand such operations, however, is not Coronado, but the Navy's more isolated sites. The noise at our home is not the only concern: Human health -- One of the principal consequences of expanded war exercises in Coronado is noise pollution,which is well documented to cause hyhpertension, high stress levels, tinnitus, hearing loss, sleep distrbances, and harmful emotional effects. The radius affected by this noise pollution extends well beyond the area immediately adjacent to the site. Given the magnitude of the noise and the efficiency with which sound travels over water, this exposes the entire southern half of Coronado. Another major effect is air and water borne pollutants, toxic debris, and shoreline contamination from toxic chemicals that are carried in or produced by exploded ordinance. These include toxins and carcinogens such as depleted uranium, mercury, and lead, as well as irritants and irritant produces such as titanium tetrachloride, red and white phosphorus. This is to name just a few of the associated chemicals known to be harmful to humans. Loss of residential atmosphere -- Our troops are crucial to our safety and we support them, their training, and their families. Many of them and their families also live here in Coronado. Proper support requires that we provide appropriate separation between domestic living arrangements and war simulations. This is especially relevant given the widespread occurrence of PTSD and related disorders in returning service personnel. Environmental impact -- The Navy's own EIS acknowledges that there will be a significance impact on marine ecology, including bioaccumulation of chemicals in the food chain, death from exposure to toxic chemicals and bomb blasts. In additino to direct physical harm, there is also the impace of noise on animal life in the reduction of usable habitat, which in the case of endangered species hastens the extinction process. The Navy's training use of sonar has already increased the deleterious exposure of marine mammals, and this expansion will further increase the burden of noise pollution on them. Local economy -- The Hotel Del Coronado is Coronado's major tourist destination, and it sits adjacent to the area where exercises are increasing. The noise and smell from these activities would effectively degrade anyone's experience of staying in Coronado. The repercussion for Coronado's standing as one of America's most desirable tourist and vacation destinations would be rapid and detrimental, and this would be felt as a permanent blow to the local economy and tax base. In short, we strongly feel that the the proposed increase of Navy exercises in Coronado would be certain to have serious and long term detrimental effects on the quality of life in Coronado, lasting well beyond the period of time in which the exercises actually occur. For this reason, we take a strong stand against such expansion.

## E.1.49 Reiko Gregory

Representing: Private Individual
Organization:
Name: Reiko Gregory
Date: 3/30/2010 8:54:30PM
Subject: Military Training Activities
Comment: As a native San Diegan of over 50 years and one who has enjoyed the serenity of Silver Strand from Coronado to Imperial Beach for many years, especially as a natural habitat for many birds and other animal species, I am appalled that the Navy is requesting to expand its activities there. I call on all those in power to keep the Navy activities out of these areas. Save our natural habitat, save the Strand. We don't need more military buildup. We need to preserve our peaceful natural habitats and our beautiful environmental surroundings.

## E.1.50 Steven Gregory

Representing: Private Individual

Organization:

Name: Steven Gregory

Date: 3/30/2010 9:01:51PM

Subject: Other

Comment: As a San Diego resident for more than 30 years, I have enjoyed Silver Strand and the peace that it offers. Increasing military activity in this location would be harmful both from an environmental standpoint and aesthetic standpoint. Silver Strand is not only a resource for San Diego residents, but for tourists as well. And while the EIS does address the impact the increased military activities would have on terrestrial animals, the full impact is never certain, and the impact on aquatic flora and fauna is unknown and therefore a "risk" that should not be taken. I fully understand the need for training, but not at the expense of the environment and people. The military would be better served increasing moral, cultural, and ethical training, which would create a more enlightened military, rather than one that knows how to kill. I call on the people in charge to not increase military activity in this area. Our dwindling resources do not need to come under attack from our own military.

### E.1.51 Robert Hrodey

Representing: Private Individual

Organization:

Name: Robert Hrodey

Date: 3/7/2010 12:36:26PM

Subject: Other

Comment: Having visited the Coronado area several times over the years, we always enjoy the presence of the military and their training in the area. It reminds us of where we are, how we got there and what it takes to remain free to travel about. If the folks upset with additional training of our armed forces to allow them to better perform their duties, let THEM (the protesters) take up arms and put it on the line for us. That should settle the debate!

### E.1.52 Carol Humphrey

Carol Humphrey

Dear Mr. Randall,

As a resident of Coronado, I am writing to express my support for the Navy exercises as I am profoundly grateful for all the military does. With appreciation,

Carol Humphrey

### E.1.53 John Hunter

DEAR UNITED STATES NAVY, FEBRUARY 25, 2010

I WRITE BECAUSE I AM TIRED OF OTHERS SPEAKING FOR ME. I HAVE LIVED ABOUT 55 FEET FROM THE BASE SINCE THE SUMMER OF 2002. THE BASE HAS NEVER BEEN A PROBLEM. THE PROBLEMS IN THE NEIGHBORHOOD ARE NOT RELATED TO THE BASE. PLEASE CONTACT ME IF YOU WISH TO DISCUSS WHAT I FEEL ARE ETHICS VIOLATIONS REGARDING COMPLAINTS TO YOUR EXPANSION.

GO FOR IT!

THANK YOU FOR ALL YOU DO,

JOHN HUNTER
512 4TH ST
IMPERIAL BEACH, CA 91932

### E.1.54 Miriam Iosupovici

Representing: Private Individual

Organization:

Name: Miriam IOSUPOVICI

Date: 3/22/2010 9:49:19PM

Subject: Social or Economic Conditions

Comment: Choosing to do this in one of the most beautiful beach environments in the US, close to major population centers that need a peaceful resource, seems a poor choice.

Representing: Private Individual

Organization:

Name: Miriam IOSUPOVICI

Date: 3/22/2010 9:49:19PM

Subject: Water Resources

Comment: We already have problems with pollution in this area. What will the effect be on the military if they contact illnesses during training? What will increased pollution effects be from training vessels?

Representing: Private Individual

Organization:

Name: Miriam IOSUPOVICI

Date: 3/22/2010 9:49:19PM

Subject: Noise

Comment: I simply don't trust that the noise levels will NOT be intolerable at the increased level proposed. I don't want to hear the echo of bombardment PERIOD. What ab the fact that we have many vets living here. Will there be increased PTSD responses to the sounds? Nothing I have read discusses this potential issue, one I am aware of as a mental health professional. Helicopter overflight noise already impacts my environment at present levels. Increases predicted will be intrusive. We have no idea what the impact will be on birds utilizing the Tijuana Estuary, part of the Pacific Flyway, despite the EIS document's assertions.

Representing: Private Individual

Organization:

Name: Miriam IOSUPOVICI

Date: 3/22/2010 9:49:19PM

Subject: Birds

Comment: The Pacific Flyway is under this area. Over 350 species of birds may be impacted, assertions to the contrary that they would not be. Imperial Beach has a difficult economic situation and visitation to this area due to bird life is one of the few income generating parts of our economy. Why would birdwatchers choose to come to an area where they are forced to watch birds with an incessant sound of helicopters, even assuming this wouldn't alter migration patterns (an assumption that strains credulity) The Silver Strand plan to increase training will inevitably negatively impact the nesting and fledgling of Least Terns due to increased foot and vehicle traffic. This Least Tern project has been successful until now. Why should we believe this EIS will be enforced after it is approved?

## E.1.55 Rina Kelley

February 24, 2010

Kent Randall
NAVFAC Engineering Command Southwest Code: OPME
2730 McKean St, Bldg 291
San Diego, 92136-5198

Subj: Lack of Navy Stewardship for Public Health and Safety in Imperial Beach

Sirs;

On the occasion of the meeting this date on your proposed expansion of activities at your SSTC Complexes and associated EIR I want to take the opportunity to inform you about your lack of attention and dangerous disregard of your property in Imperial Bch which has created a dangerous condition for years.

Your misuse of the word "Stewardship" in your Eis to expand training activity in your SSTC may serve the Fairy Shrimp and Snowey Plover well, but your neglect for the welfare of the inhabitants of my City who have been subjected to your dangerous threatening activity for years is deplorable.

You are hereby put on notice that first, your steel Seawall outside of the Camp surf fence at the Beach has huge holes and serves no purpose except to attract children and has become a serious hazard to the safety and welfare of all of us. Its jagged rusted steel rim and bottom are hazardous and constitute a daily accident-waiting-to-happen for the numerous children who climb upon it both within and without the confines of Camp Surf. Since these children have little supervision anyway , you must take control and remediate this problem. This rusty steel nuisance has fallen in such disrepair that it has not served a purpose for at least ten years, and I fear for my own as well as the safety of others whenever I approach it to get down to the beach area. Would you have us wait another ten years for you to remediate and remove it. Hopefully not, now that you are formally on notice with Legal effect. Your personnel--police and others entering the camp at Antenna Station (SSTC South) often speed down Carnation avenue when your personnel should instead be using Silver Strand St in mornings which goes directly to their station. Please post signs on your side of Carnation, the North side, with warnings to slow down as numerous children and people frequent that area to the corner going to and from the Beach.

I feel like I live in a War Zone in summer when SEALS shoot guns and explode munitions within SSTC SouthEast. Could you please put a time limit on this activity so I can sleep at night and provide a schedule of upcoming events so I can leave town. Also, your planes from NASNI fly late overhead doing exercises in violation of agreements you have made with our Congressional and Civic leaders. Please don't allow this activity to continue past 9PM and afford us a timetable so I can leave town with my animals and children.

Your YMCA Camp is a nuisance, continuing to play loud music and solicit screaming and yelling well past the 9PM agreed-upon time. Please have this activity cease. (Read the Police Report on your Camp Director, Mr Thompson who assaulted my friend a Navy SEAL's wife next door when she went over to tell him to turn down the music and was 8 months pregnant and later lost her baby). I feel forced to sell my home which I must further depreciate by declaring in Real Estate papers that I live in a War Zone due to the above activity which threatens and annoys constantly in Summer months. A former Air Force Officer, I cannot begin to understand how the Navy can be allowed to perpetrate such damage on a Community when my fellow Air Force personnel would never have dared. Why don't you go to Corregador or the Phillipines where you can conduct your endless and mindless training missions. General MacArthur drove out the Japanese over there so they can't hurt you anymore- Unless you drive a Toyota. Or better still, Puerto Rico where the Air Force goes, or Haiti. In short I protest this EIS which, in the aggregate, continues to wreak more havoc on my Community. And I have no doubt that in a few years, with the perverbial Camel's Nose already in the door, you will be sending invitations to a like event.

Signed,

Rina Kelley
137 Carnation AV, IB

## E.1.56 Ann S. Kennedy and General Edward Baumer

March 19, 2010

Naval Facilities Engineering Command
Attn: Mr. Kent Randall
Silver Strand Training Complex EIS
1220 Pacific Highway, Building 1, 5th Floor
San Diego, CA 92132

Dear Mr. Randall,

I am a resident of Coronado and I live at Coronado Shores in El Mirador and overlook your facility from the 16th floor. The address is Ann Kennedy, 1820 Avenida del Mundo, #1603, Coronado, Ca 92118.

I have learned that the Department of the Navy is planning on increasing the levels of training at the Silver Strand Training Center. I hope that you can provide the level of quiet enjoyment that I have experienced for the last 8 years as I am a full time resident.

Sincerely,
Ann S Kennedy

Ann S. Kennedy
1820 Avenida del Mundo, 1603
Coronado, Ca 92118
619-522-9999

This letter is also from
General Edward Baumer
1820 Avenida del Mundo #1504
Coronado, Ca 92118

### E.1.57 C. Kennedy

Representing: Private Individual

Organization:

Name: C Kennedy

Date: 3/9/2010 3:29:42PM

Subject: Miltary Training Activities

Comment: I have just submitted a comment, and Iam wondering if you have received it?

### E.1.58 Celeste Kennedy

Representing: Private Individual

Organization:

Name: Celeste Kennedy

Date: 3/9/2010 3:32:37PM

Subject: Military Training Activities

Comment: I have just submitted a lengthy comment, but when I pressed the ADD COMMENT button it was deleted. I gave many reasons and examples for my position in my former comment, and I am reluctant to retype it all. In general: I am opposed to the increase in Naval Training Exercises at the Silver Strand Complex Naval Training Area. We are long time residents and homeowners in Coronado and we have witnessed the increase in traffic, noise, and pollution of this gem of a town which has the U.S. Navy as it's neighbor. While not all negative environmental impacts are attributable to the Navy, the fact is that many of them are, and when you combine them with the already overwhelming levels of noise, traffic, air and water pollution, it makes no sense to increase it all by ramping up Navy Training Exercises on the Strand. Helicopter flights down the bay are very noisy and bothersome. The exhaust which we can see coming out of those machines is certainly unhealthy. Increasing their activity is unacceptable. The gunfire we hear with the war games and training is a frightening and bothersome sound for civilians such as ourselves. Please do not increase the amount of gunfire we must hear. I imagine the amphibious craft are gross polluters of the sea as well. While it is admirable that the Navy has participated in the Least Tern preservation efforts, we would like to see efforts towards preservation of clean air, water, and peace and quiet as well. Coronado has grown over the years and has become densely populated with the addition of the Coronado Shores and Cays residential projects. All areas of Coronado, as well as all areas of the southern San Diego bay and coast, are affected by Naval training exercises. Please do not increase any of it, as we are already enduring way too much. Perhaps consider Camp Pendleton as a spot to increase the training exercises. It provides a vast coast and inland area which affects far fewer civilian residents. Thank You

## E.1.59 Gary Klopp

Representing: Private Individual

Organization:

Name: Gary Klopp

Date: 3/29/2010 10:27:21PM

Subject: Air Quality

Comment: As a SBC and active duty member of NSW since 2000, I feel the need to convey some of my concerns. I do sympathize with the balancing act of training our warriors economically, efficiently, and to the standard that our country and NSW warriors require and deserve. I fully understand that our countries security is at stake; however, the amount of training and location of that training must be balanced with the surrounding communities and environment. Many studies have proven that people who live near airports have a much higher than national average of cancer due to all the exhaust and fuel that is released into the air. Under the proposed plans, helo flight hours would increase dramatically certainly affecting the air quality surrounding Imperial Beach and outlaying areas. Camp Pendleton offers large training areas to include military air space, small and heavy weapon ranges, beach access for amphibious operations, ammunition storage, helo landing sites, and various supporting facilities and infrastructure. This area is much larger than the limited area on the strand and there is much more open acreage between San Diego and San Clemente. Although not as convenient to NAB Coronado or the Advanced Training Center, it is close and would meet the "balancing act" that I stated earlier. The impact at Camp Pendleton would be much less felt than here on the strand.

Representing: Private Individual

Organization:

Name: Gary Klopp

Date: 3/30/2010 12:05:27AM

Subject: Noise

Comment: As a SBC and active duty member of NSW since 2000, I feel the need to convey some of my concerns. I do sympathize with the balancing act of training our warriors economically, efficiently, and to the standard that our country and NSW warriors require and rightfully deserve. I fully understand that our countries security is at stake; however, the amount of training and location of that training must be balanced with the surrounding communities and environment. With the proposed increase of helo operations, noise pollution would increase dramatically affecting ALL citizens of Imperial Beach, especially those like myself and our family that live close to the beach and existing training areas. If the amount of helo operations and training that you are proposing already existed, then certainly we would have no right to complain, but we bought our home and have lived here since 2002. We chose to make this our home and to retire here because we like the peacefulness and small town feel of I.B. We enjoy listening to the sound of breaking waves and wildlife, not the sound of helos. If we wanted to hear flight ops all the time, we would have bought our home by the airfield. It is currently 2010 and one plane has flown directly overhead and 3 helos have passed by while I type this. I do not believe it is fair that we should have to suffer through increased noise when other training areas exist that would meet the Navy's NSW training requirements. Camp Pendleton offers large training areas to include military air space, small and heavy weapon ranges, beach access for amphibious operations, ammunition storage, helo landing sites, and various supporting facilities and infrastructure. This area is much larger than the limited area on the strand and there is much more open acreage between San Diego and San Clemente. Although not as convenient to NAB Coronado or the Advanced Training Center, it is close and would meet the "balancing act" that I stated earlier. The impact at Camp Pendleton would be much less felt than here on the strand. My wife and I sincerely hope that you will find alternative training sites that already exist that can handle a larger capacity of training that will not be nearly as detrimental to a small beach community such as I.B. which already faces so many challenges in these tough economic times. V/R Gary and Nicole Klopp

Representing: Private Individual

Organization:

Name: Gary Klopp

Date: 3/30/2010 12:05:27AM

Subject: Other

Comment: Although Imperial Beach is an extremely unique small town beach community, we continue to struggle economically for several reasons: Our proximity to the Mexican border and Tijuana, degraded water quality due to runoff and pollution from Mexico, lack of small business infrastructure, school ratings, and past stigmas are just a few of those reasons. Even with all the challenges I.B. faces, we have a lot in our favor, and every year brings more and better change albeit slowly. If you push forward with the proposed increases of training, helo operations, and live fire, you will certainly hinder this city and the people of I.B immensely. This area, and the surrounding area just can't handle the volume of increased training that you are proposing. Property value will be affected and home ownership will decrease. It will be even harder than it already is to attract new families to our town with all the noise and disruption that will certainly be experienced if your training proposals get approved. You currently aren't conducting training in front of the Hotel Del or the area between the hotel and North Island, or even the beaches on North Island, why I.B.? Because we don't hold the clout and financial means as a community that Coronado does? Other training areas already exist that would meet the Navy's NSW training requirements. Spare I.B.

Representing: Private Individual

Organization:

Name: Gary Klopp

Date: 3/30/2010 12:05:27AM

Subject: Air Quality

Comment: Many studies have proven that people who live near airports have a much higher than national average of cancer due to all the exhaust and fuel that is released into the air. Under the proposed plans, helo flight hours would increase dramatically certainly affecting the air quality surrounding Imperial Beach and outlaying areas.

Representing: Private Individual

Organization:

Name: Gary Klopp

Date: 3/30/2010 12:20:14AM

Subject: Noise

Comment: As a SBC and active duty member of NSW since 1990, I feel the need to convey some of my concerns. I do sympathize with the balancing act of training our warriors economically, efficiently, and to the standard that our country and NSW warriors require and rightfully deserve. I fully understand that our countries security is at stake; however, the amount of training and location of that training must be balanced with the surrounding communities and environment. With the proposed increase of helo operations, noise pollution would increase dramatically affecting ALL citizens of Imperial Beach, especially those like myself and our family that live close to the beach and existing training areas. If the amount of helo operations and training that you are proposing already existed, then certainly we would have no right to complain, but we bought our home and have lived here since 2002. We chose to make this our home and to retire here because we like the peacefulness and small town feel of I.B. We enjoy listening to the sound of breaking waves and wildlife, not the sound of helos. If we wanted to hear flight ops all the time, we would have bought our home by the airfield. It is currently 2010 and one plane has flown directly overhead and 3 helos have passed by while I type this. I do not believe it is fair that we should have to suffer through increased noise when other training areas exist that would meet the Navy's NSW training requirements. Camp Pendleton offers large training areas to include military air space, small and heavy weapon ranges, beach access for amphibious operations, ammunition storage, helo landing sites, and various supporting facilities and infrastructure. This area is much larger than the limited area on the strand and there is much more open acreage between San Diego and San Clemente. Although not as convenient to NAB Coronado or the Advanced Training Center, it is close and would meet the "balancing act" that I stated earlier. The impact at Camp Pendleton would be much less felt than here on the strand. My wife and I sincerely hope that you will find alternative training sites that already exist that can handle a larger capacity of training that will not be nearly as detrimental to a small beach community such as I.B. which already faces so many challenges in these tough economic times. V/R Gary and Nicole Klopp

Representing: Private Individual

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Name: Gary Klopp

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Subject: Air Quality

Comment: Many studies have proven that people who live near airports have a much higher than national average of cancer due to all the exhaust and fuel that is released into the air. Under the proposed plans, helo flight hours would increase dramatically certainly affecting the air quality surrounding Imperial Beach and outlaying areas.

Representing: Private Individual

Organization:

Name: Gary Klopp

Date: 3/30/2010 12:20:14AM

Subject: Environmental Justice

Comment: Again, having been a member of the NSW community since 1990 and a NSW operator since 1994, I have seen a lot. Although the Navy has taken big steps in recent times to address environmental concerns, and as a nation, we have become much more aware of our environment and how our actions affect everything around us, the amount of detrimental effects on the environment along the silver strand training areas will increase drastically. Unused ammo (blanks) get dumped over the side. Food wrappers, MRE packaging, various operating items (550 chord, line, rubber bands, night sticks, etc) all get mixed into the environment. Shell casings, links for the ammunition, fuel oil from the zodiacs, exhaust from the craft and air assets, batteries, etc. Even with the best of intentions, all this is unavoidable. Men get wet, cold, hungry, tired, mentally and physically exhausted, and everything always goes wrong at the worst possible time. Believe me, I know from experience! The precious beaches that encompass and surround these training sites provide endangered habitat and wildlife refuge and the ability to recreate. These species of animals and plants struggle for survival everyday in a world that continues to build and shrink there natural habitat. The noise pollution, air pollution, water pollution, and human pollution that is simply unavoidable during the types of amphibious operations that will be conducted with alarming frequency will only continue to make the environmental concerns bigger. Along with all of these issues, is the simple fact that people live here to enjoy the beach, wildlife, and ocean. Increasing the training that you are proposing does nothing to benefit anyone or anything in I.B or the Silver Strand. Please use training areas that already exist that can better support the large volume of training that you are proposing.

## E.1.60 James M. Knox

# Questions and Comments on the Silver Strand Training Complex Draft Environmental Impact Statement of January 2010

This was a very long and complex report. I have tried to put my concerns and questions in the order in which they are considered in the IES. There are numerous redundancies of the many issues considered in this report, many without cross reference locations, consequently some of my questions and concerns are also redundant. I have tried to refer to the specific location in the EIS when addressing a concern or question. The questions and concerns presented here apply only to the SSTC-S.

3.1.2.3.2 Beach Activities
How many more activities and restrictions will take place over and above what is done now at SSTC-S?

3.5.1.4.2 & 3.5.1.5.2 Pacific Ocean
Contaminants
Your report states that most of the contamination of the area is cause by sewage from the river mouth and/or the South Bay Ocean outfall. Storm water runoff has a relatively minor influence on local water quality.
Table 3.5-5
Will increased training at SSTC-S cause more contaminates to reach the ocean by storm water runoff. Rain events occur mainly in the winter when ocean currents in the area are north to south. Were seasonal changes in ocean water movement taken into account when the findings on contaminants were formulated?

3.5.1.5.2 Pacific Ocean
Silver Strand State Beach does have day and overnight use numbers that were not included in this report.
I would question the conclusion that the information presented is not representative of the use of the municipal beach in Coronado. The report, in other sections, extrapolated information that was used for conclusions without complete numbers.
Navy recreational areas (Gator Beach and Fiddler's Cove) should not be included as recreational opportunities. They have restricted access and are not open to the general public.

3.6.1.5.2 & 3.6.1.5.3
Will LCACS be used on both Purple 1 and Purple 2?

3.6.1.6
The Navy should also notify residents. The sound of M16's and 50's along with concussion grenades without notice very late at night or early in the morning can lead to apprehension if a person does not know that training is taking place. Explosions and small arms fire are easily detectable from my home, and loud enough to wake me up.

Table 3.6-5 Helicopter Pass-by Sound
It has been my experience that the Helicopters used during training are, during many of the evolutions, closer then stated in the table.

3.6.2.3.1 Traffic on ST-75 (local roads)
Silver Strand Blvd in Imperial Beach leads to the main gate of the South Complex. How much will traffic increase on this residential street? How will this increase in traffic affect the acoustical environment of this residential neighborhood?

3.6.2.3.2
New training activities will increase helicopter use. (TRAP) (N9, Table 2-2)
Disagree with conclusion that noise level will not change. Each flight is a separate event, with individual consequences regarding sound. Weather, temperature, wind direction, and pilot skill all contribute to each event. Suggesting that the helicopters will always be in their assigned flight lanes without data is an assumption. The helicopters get out of their flight lanes many times (personal observation). Training evolutions may have variations that are not foreseen. This fact needs to be taken into consideration when making conclusions. More use equals more sound in the adjacent residential areas.
Citing the ambient sound of the surf supplies no useful data without knowing; the size of the surf, the direction of the swell, the direction and strength of the wind, and the tidal level. None of this information is contained in the table.

3.6.2.3.4 Amphibious Training
Increase from 10,000 to 13,800
LCAC 8 to 40 (increase of 5 times current)
I must disagree with the conclusion. While the average sound during each evolution may not increase the amount of times of discomfort will increase by a factor of 5. (40 instances verses 5 instances). Each time an LCAC lands is an individual event with individual consequences regarding sound Depending on wind conditions I can easily hear the LCACs when they are used on the purple beaches at the north end of the South complex.

3.6.2.3.5 Munitions
Sound generating activities will increase by 48%. How much of this 48% will be at the South complex and at what times of the day or night?

3.6.2.3.7 Summary Alt 1
Finding of no adverse effects. The last paragraph states the sound levels would increase during all days and hours of the week with no notice to residents. I would disagree with the conclusion of no adverse effects. Residential areas will be affected.

3.6.4 Table
Why were no residents of Calla or Citrus Avenues interviewed?

Table 3.6-11 Summary of Effects
Mitigation: Please add notifies residents and local emergency personnel.

3.14.1.4.2 Palm Avenue & 3.14.1.4.3
The description is wrong. To continue West on Palm after the four way stop at 3rd street you must be in the left hand lane. The right hand lane on Palm is right turn only. This causes large backups at times at the four way stop and also makes it very hard to turn left onto Palm from Silver Strand Blvd. Palm Avenue has been restriped for two lanes West of Third street until Seacoast Drive. Rainbow Drive is striped for two lanes.
What counting devices were used and when was traffic counted by SANDAG?

3.14.1.4.4
The entrance to Silver Strand Blvd. from Palm Avenue has changed in the last year. It is now a sharp right hand turn to a narrow road that slowly winds left and widens. Why was no study to measure ADT done by the Navy?

3.14.1.5.2 SSTC-S
The Camp Surf entrance is on the West side of Silver Strand Blvd, half a block from the entrance gate to the Training Complex.

3.14.2.2.2 Ground Transportation
Last paragraph: No data on Silver Strand Blvd. to support conclusion.

3.14.2.3.1
249 trip in means 249 trips out for a total of almost 500. This is a significant increase in traffic on a short residential street.

3.14.3 Mitigation Measures
I would suggest opening the North Gate for groups of over three vehicles to help reduce the approximately 500 daily trips to the South Gate on such a short residential street as Silver Strand Blvd.

4.2.1 Table 4-1
Why does sand need to be removed and relocated? Where is the sand that is removed being relocated?

4.3.6
Sounds associated with redevelopment in Imperial Beach have nothing to do with sounds that come from training activities in the South Complex.

Thank you for considering my suggestions and questions.
James M Knox
235 Calla Avenue
Imperial Beach, Ca. 91932
(619)423-8152
jksurf@cox.net

Resident of Imperial Beach since 1951 (before it was incorporated as a city)
Attended Imperial Beach Elementary School, Mar Vista Junior (now Middle) School
Graduated from Mar Vista High School in 1966
BA San Diego State University, 1970
MA Azusa Pacific University 1979
Retired High School Teacher (23 of 36 years teaching spent at Mar Vista High School)
30 years experience as a Seasonal Beach Lifeguard

### E.1.61 N.J. Kuebler

Representing: Private Individual

Organization:

Name: N. J. Kuebler

Date: 3/14/2010 3:48:44PM

Subject: Traffic or Transportation

Comment: I would encourage the EIS to do a more thorough study of the traffic impact on the Silver Strand/Hwy. 75. I read the interview Delphin Lee did with KPBS in which she commented that current traffic is 1% of the throughput there. My address is a "rim" home in the Coronado Cays residential area. Weekdays, I can tell what time it is from the volume/noise of traffic, in spite of double paned windows and two useless "sound walls" along the perimeter of the complex here.

Representing: Private Individual

Organization:

Name: N. J. Kuebler

Date: 3/14/2010 3:48:44PM

Subject: Other

Comment: I believe the residents of Coronado, Imperial Beach and the Silver Strand areas could use more information published or mailed in regard to this EIS study. I ran across terms in online pages regarding the study such as "elevated causeway system", "fluid transfer system", "new platforms and equipment", and "new training". Without knowing what those are, how can we consider the impact they might have? The full pdf document would not download for me, and there are many who cannot access it at all or make it to the public meetings. I hope you will use your resources to make the information we need more available.

### E.1.62 Stephen LaPalme

Representing: Private Individual

Organization:

Name: Stephen LaPalme

Date: 3/14/2010 11:38:52AM

Subject: Military Training Activities

Comment: Your comment dropdown list should allow you to comment on several issues since many are interconected. I am VERY MUCH AGAINST the military increasing it's activities and foot print in the silver strand area. If anything they should be considering downsizing and eventually closing the bases since they are incompatible with domestic and social harmony. Any considered activities should be relocated to the Camp Pendelton base due to it's substantial land area and distance from populated locations. Military drones and the removal of personnel from Afganistan and Iraque make this increase in activity unwarrented and unneccesary. As general and president Dwight D Eisenhaur said, "beware the military industrail complex". Increased military activities = increased military contracts= a negative draw on society and the economy. Thank you, Stephen LaPalme

### E.1.63 Barbara Lathrop

March 25, 2010
Barbara Lathrop
91 Kingston Ct. W.
Coronado, CA 92118

Naval Facilities Engineering Command, Southwest
Attn: Mr. Kent Randall – Silver Strand Training Complex EIS
1220 Pacific Highway, Bldg.1, 5th floor
San Diego, CA 92132

Re: Silver Strand Training Complex EIS

Dear Mr. Randall

As an owner and resident of the Coronado Cays I would like to express my very serious concerns regarding the proposed increase of training and helicopter flights along the Silver Strand. At present helicopters are flying over the Cays although it was my understanding this was not to happen. With the proposed increase of helicopter flights by 185% this is frightening to me.

The expanded activities will disrupt the lives, well being and sleep of the residents of the Cays considerably unless the paths of travel to and from the training areas are limited to at least 1000 yds off of the ocean and into the bay on the bay side. All residents on the Silver Strand will be affected as well as beach users at the Silver Strand Beach Park, a park used by many all summer. I live halfway between the bay and the ocean and am disturbed by the current helicopters flying now and the proposed night flights and increases will cause great distress and disturbed sleeping that will affect the health and quality of life for us all. The entire Strand is a recreation area used by runners, joggers and bicycle riders and the increased training with the noise and smoke from some of this training will destroy one of the loveliest areas available for these pursuits.

I beseech you to give my requests your consideration to preserve the environment of this beautiful area.

Yours truly,

Barbara Lathrop

## E.1.64 Becki Lock

Representing: Private Individual

Organization:

Name: Becki Lock

Date: 3/30/2010 12:54:52PM

Subject: Military Training Activities

Comment: To Whom It May Concern, this is in response to the request to increase training activity along Silver Strand State Beach and IB. While we understand the need to train and perhaps to increase training, many of us do not feel as if the area can sustain the levels of ramped up training you are requesting. This is not a "not in my backyard" issue. This request for increased activity is just plain too much in a relatively small space. There has to be more alternatives and/or a creative way for the Navy to get the training they require (share with Pendleton?) without causing so much potential harm. Quality of life will be severely impacted. Too much noise (often late at night) will cause much disruption to the community which supports you. Beyond that, most are very concerned about the environmental impact. The stretch of beach is very narrow and the many protected species of bird are at risk. Further, the multitude of requested beach landings, more concussion type grenades, more land pollution, and more fuel polluting the water, means there is obvious potential to inflict a lot of damage to the sea life. Please know that we as a community want to continue to support the military. However, the request to increase training to the levels stated is not supported. Many won't state their objection out of fear and feelings of helplessness. So, please consider the community (as we do pay our taxes to support you) when determining what is appropriate.

### E.1.65 William and Erna Lockhart

# Department of the Navy
## Silver Strand Training Complex
## Draft Environmental Impact Statement

### Public Hearing Comment Form

**Location:** IMPERIAL BEACH **Date:** 2-23-10

**Thank you for providing comments on the U.S. Navy's Silver Strand Training Complex Draft Environmental Impact Statement (EIS).** Please provide comments no later than March 9, 2010. Comments may be submitted at the meeting, by visiting the project Web site at www.silverstrandtrainingcomplexeis.com, or via U.S. Postal Service to the address below.

Please see attached comments

***Please Print***

1. Name WILLIAM + ERNA LOCKHART
2. Address 611 SILVER STRAND BLV.
IMP. BEACH, CA. 91932

1. Please check here [X] if you would like to be on the mailing list.
2. Please check here [X] if you would like your name/address kept private.

Please give this form to one of the U.S. Navy representatives, place in the drop box, or mail by March 9, 2010 to:

**Naval Facilities Engineering Command, Southwest**
**ATTN: Mr. Kent Randall - Silver Strand Training Complex EIS**
**1220 Pacific Highway, Building 1, 5th Floor**
**San Diego, CA 92132**

William and Erna J. Lockhart
611 Silver Strand Blvd
Imperial Beach, CA 91932
619-429-4060

March 2, 2010

Naval Facilities Engineering Command, Southwest
ATTN: Mr. Ken Randall – Silver Strand Training Complex EIS
1220 Pacific Highway, Building 1, 5th Floor
San Diego, CA 92132

Mr. Randall:
We attended the presentation in Imperial Beach, February 23. Unfortunately, we had to leave before all the comments had been heard, but we were encouraged to voice our concerns, and here are ours:

Concerns: Traffic on Silver Strand Blv. Leading into the radio station
Noise factor due to increase in the sorties
Number of exercises
Concern for children's safety at Camp Surf.
Height of platforms etc. to be built
Effect on Property values

We have lived in North IB for 20 years - just a few houses from the gate leading to the radio station. We are enjoying an unobstructed view from our balcony from Point Loma to Coronado to Silver Strand, unbelievable sunsets, sound of the surf – peace and tranquility, and we like it that way. Even Camp Surf took care not to disturb the views when they expanded.

We understand the need for training to stay alert. Believe us, we are all for the military- (my husband is a WWII D-Day 13 veteran with the RAF.) But having the peace in this, as yet undiscovered, quiet little town suddenly being disturbed by that huge increase in sorties (up to 2200) , firearms (from 150 to 1400) and training excercises to 5,343 – and in addition the mine-fields, vernal pools, and disruption of the life of endangered species - is a lot to ask of us.

5,343 exercises – There are 365 day a year! So how many a day, month? Time of day? And how many here at beaches white and purple..? Will the helicopters take off from and land close to North end of IB? -

Is it not possible to incorporate the training with the all the area you have now and have had for 60 years.?

Yes, it is nice for our nice young military men to be able to go home to their own beds – but what about us, the residents, who will have our nights and sleep disrupted? And the building of "platforms" - will they obstruct the view?

Children at Camp Surf - Concern for their safety with possible discharged bullet casings, mine debris? not to mention the air pollution from the helicopters.

Effect on property value, with the increased noise and disturbances. Who would want to buy (now) prized beach properties when they will be having the noise of helicopters and machine guns to contend with?

Would suggest that in addition to notifying the fire station and police station of upcoming exercises, why not place a notice in our local paper, The Imperial Beach Eagle with a date ( of course, if that is not a secret) so we will not be concerned when we hear the machine gun fires.

Last but not least, the speed of cars must be controlled on Silver Strand Blvd. There are children, not only in Camp Surf, animals, bicyclist and elderly slow walking People crossing the street. We would like to see a 25 miles zone and a speedbump On Silver Strand Blvd.

You asked for comments, - and we are giving you ours. Not that we expect to get answers to our concerns directly, but perhaps through some of the additional meetings you no doubt will be conducting some of them will be addressed. We hope so.

Thank you for your time.

Sincerely yours,

William + Erna Lockhart

William and Erna Lockhart

## E.1.66 Donna MacKersie

Representing: Private Individual

Organization:

Name: Donna MacKersie

Date: 3/18/2010 11:23:03PM

Subject: Military Training Activities

Comment: I have been a homeowner in/resident of Imperial Beach since 1993, and I am very concerned about the Navy developing the Silver Strand further for military training, killing more flora and fauna in that delicate area, and creating additional noise in Imperial Beach, which is already inundated by helicopter noise. I am aware that some people are impervious to noise, but I am not one of them. Since I've lived in I.B., I've been awakened MANY nights by loud helicopters circling my area, typically around 11-12pm, either Border Patrol or Sheriff agents, searching for illegals or whatever they're doing. Additionally, since, after 40 years as a legal secretary, I have been largely unemployed for the past year and a half and have been spending a lot of time at home during the weekdays, there is a CONSTANT roar of airplane engines that we must suffer through during the daytime hours. I understand that there is value in training near the shoreline, but is it not possible to create training locations in areas where we residents and the flora and fauna of the area will not be negatively affected? What about the vast areas in Otay Mesa -- why not train out there? I feel the same about this as I do about the idiocy of building ANOTHER stadium in downtown San Diego, which is already heavily overcrowded, traffic is impossible, etc., etc. -- why don't they build a stadium in Otay Mesa? It's close to San Diego, and there's a huge amount of space out there, and they wouldn't be wasting oceanfront space and creating additional traffic and noise problems for local residents! I cannot even imagine what the traffic would be like if they built a stadium in the National City beach area as was being considered! I-5 is a nightmare as it is during rush hours -- are these developers really that clueless, or are they only looking for increased income? The attorney promoting building the Chargers stadium says that events there won't conflict with the rush hour -- who does he think he's fooling? Please -- train elsewhere! The Olympic Training Center built in the east where there was space -- certainly the Navy can do likewise. I do not want to have to sell my home and move elsewhere because the noise has become intolerable. Donna MacKersie, 869 5th Street, Imperial Beach, CA 91932

## E.1.67 Zeke Mazur

Since the military requires exclusive use of the beach at certain times; I would like the Union Tribune, on its weather page, to list when the beach is closed.

## E.1.68 Patricia W. McCoy

**March 8, 2010**

Mr. Kent Randall
Naval Facilities Engineering Command Southwest
Code: OPME
2730 McKean St. Bldg. 291
San Diego, CA 92136-5198

Dear Mr. Randall:

Thank you for the opportunity to address issues of concern in the Draft Environmental Impact Statement at the Silver Strand Training Complex.

First, let me state that I do understand the U.S. Navy's need for combat training readiness to accomplish their mission in various arenas around the globe.

However, I do believe there are some items that could be changed enough to make life bearable for people in Imperial Beach, particularly those of us who reside in the northern portions of the city.

We have been good neighbors to the Navy in all the years this base has been operational. Now we are asking you for a small quid pro quo. Since some of the noise related exercises are really not mitigable we would request that you consider an earlier cessation of noise causing events, perhaps to 10:00 P.M. This seems eminently reasonable on a work night. The neighborhoods and your soldiers could be home and in bed at a reasonable hour and would conform to demands as outlined in the DEIS that military personnel not be deployed out of country to do this type of training. Many of us have to be up early for work and some of these workers are employed at North Island.

We had a dog park opened by the Navy under Captain Gianni (now Admiral) for our use but it was taken away and closed. We would ask that this facility be reopened for use when it is inadvisable to use the beach. This way neighbors can exercise their companion animals and have a pleasant place to go.

While you are not expanding the footprint of operations there is concern over the increased intensity of those exercises. The Navy has done a good job with their stewardship of the endangered California Least Tern and the Western Snowy Plover. There is concern for continued viability of these birds due to their habits of beach foraging and nesting, a behavior honed after many thousands of years of developmental evolution. These traits are not changed overnight just because we have a use for their habitat. Protection of vernal pools is essential for the survival of button celery and fairy shrimp. These species may seem unimportant and inconsequential in the scheme of things but I would emphasize that they are indicators of the state of our living environment. The environment is the underpinning of life for all living things including civilian and military alike and the mission of the Navy is to protect not only the civilan population of this country but also the land that sustains us.

As you state in the DEIS, this area is unique and as far as I am concerned it is uniquely beautiful and irreplaceable in its current form. I urge you to go the extra mile to protect the nation's endangered species and avoid a "take" of any of them.

As a former California Coastal Commissioner I have seen well meaning uses degrade and destroy entire ecosystems on which we all rely.

The comment period is all too short for a document ten years in the making. It would be greatly appreciated if the comment period could be extended at least another 45 days to accommodate those who would still like to respond to this eight hundred plus page document.

In conclusion I would like to remind you of the inconsistency of water quality due to sewage contamination particularly in the winter months. I do not like the idea of your young service people working in water whose quality leaves, at times, a lot to be desired. I would suggest you implement a water testing component into the document as part of your operations.

I noticed a deficiency in the document where there is no mention of climate change and sea level rise. I realize this is a NEPA document and it may not cover this topic. I would like to see realistic measures taken to cope with sea level rise. How do you propose to deal with these climate change issues in order to protect our investments at this site?

Thank you again for the chance to respond the SSTC DEIS

Sincerely

Patricia W. McCoy
132 Citrus Ave.
Imperial Beach, CA 91932
PMCCOY@aol.com

## E.1.69 Deb McKay

Representing: Private Individual

Organization:

Name: Deb McKay

Date: 3/2/2010 3:49:48PM

Subject: Other

Comment: I find access to the draft EIS problematic. While the electronic version is available in pdf, it is an extremely large file that takes time to download. Accessibility to the document would be enhanced if it were available in smaller, downloadable files. An excellent example of this is the format used by the Southern California Range Complex EIS website whereby you can search for information by chapter or section. I can dig down to the areas that interest or affect me and not have to wade through the entire, voluminous document.

## E.1.70 M. Dan McKirnan

Representing: Private Individual

Organization:

Name: M. Dan McKirnan

Date: 3/30/2010 12:42:56PM

Subject: Birds

Comment: The Recovery Plan for least terns is old and based on outdated information so there is no valid way to conclude that the additional take by alternatives 1 and 2 will not further jeopardize the species. Can the EIS provide a Species Viability Analysis that reflects current knowledge and cumulative impacts? Alternatives 1 and 2 describe the potential taking of the endangered least tern and snowy plover with the expanded military activity. I understand the law that allows incidental taking of birds during military readiness activity. What specific actions will you take in adaptive management if it is determined that excessive taking of least terns and snowy plovers is occuring? Military training in Alternatives 1 and 2 will produce significant noise impacts that could flush significant numbers of migratory birds in the Bay and along the Strand. As you referenced, this impact is more detrimental to birds naive to noise created by military activity. What adaptive management strategies will you use to study noise effects on migratory birds and make appropriate adjustments to protect birds during the migratory season? I applaud the Navy for their past efforts to protect the endangered least tern and snowy plover. However, I am not convinced that the proposed Alternatives 1 and 2 will adequate protect these species.

Representing: Private Individual

Organization:

Name: M. Dan McKirnan

Date: 3/30/2010 12:42:56PM

Subject: Environmental Justice

Comment: I am not convinced that the proposed increased military training activity in SSTC-S in Alternatives 1 and 2 does not raise the question of environmental justice for the City of Imperial Beach. As you indicated, this community has more poverty, 16.8% of persons living below the poverty line compared to 7.6% for the City of Coronado and 11.3% for San Diego County. Imperial Beach also has a higher % of Hispanics (43.9%) compared to Coronado (13.1%) and the County (29.9%). This community will experience more noise related to the military training activity with Alternatives 1 and 2.

Representing: Private Individual

Organization:

Name: M. Dan McKirnan

Date: 3/30/2010 12:42:56PM

Subject: Other

Comment: 4.3.3.1 Global Climate Change Table 4-3: Greenhouse Gas Emissions describes a doubling of emissions in tons/year with either Alternatives 1 and 2. The Secretary of the Navy has established several goals for the Navy's consumptions of fossil fuels with hybrid vehicles by 2015 and alternative energy sources including wind and solar by 2020. Alternative 1 and 2 will increase CO2 emissions by 60,554 tons/year. Why can't this EIS describe specific actions at SSTC, NASNI and NAB to offer at least 50% offsets in alternative and renewable energy for Alternatives 1 and 2?

Representing: Private Individual
Organization:
Name: M. Dan McKirnan
Date: 3/30/2010 12:42:56PM
Subject: Other
Comment: 6.2 Relationship between short-term and long-term productivity. The EIS describes military activities in Alternatives 1 and 2 as long-term. Does this mean these areas will be needed for decades? What if our need for military readiness declines in 5 or 10 years and peace breaks out? What adaptive management procedures will be undertaken to restore lost habitat and species impacted by this military activity? I endorse the No Action alternative and urge the Navy to reconsider the use of the vast Camp Pendleton site for this surge period of training.

### E.1.71 Tracy McPherson

Representing: Private Individual
Organization:
Name: Tracy McPherson
Date: 3/13/2010 11:18:49AM
Subject: Military Training Activities
Comment: March 12, 2010 Ladies and Gentlemen: I simply want to say that the city Councils of Imperial Beach ( the no growth/no change/no communication council) and Coronado City Council ( the now yuppified group that has forgotten that the U.S. Navy has supported them for decades) need to get their collective heads out of the sand or wherever they are and get out of the way. You have a job to do, Train these people and help keep America America. Go Navy. I am in the flight path of the helicopters and I do hear the gunfire occasionally. I am right across S75 from the old ComCenter.. I am reminded every time I hear this or the jets from Norls, those are o our planes and guns, the voices I sometimes hear are American.. Thank You God I am safe today and tonight. I am a civilian, my former/late husband flew Willie Victors out of North Island. God Bless All of You, Do your Job as it needs to be done. With Aloha, Tracy McPherson

### E.1.72 Robert Miller

Representing: Private Individual
Organization:
Name: Robert Miller
Date: 3/26/2010 2:05:10PM
Subject: Land Use
Comment: Growing up in San Diego just before and during the Second World War and living in San Diego, Coronado and Imperial Beach allows for a perspective on this ribbon of sand known as the Silver Strand. I lived in the Coronado Shores for over ten years and looked out on the Strand many times each day. Being in Imperial Beach for the past fifteen years I have been up and down the Strand countless times, mostly driving, but occasionally on foot. This site is world class – sun, warmth, light, open space, mild climate, ocean breezes, ocean, beautiful beaches, harbor, blue skies, aquatic activities – you name it. Housing, lodging and recreational facilities and military activities existing alongside habitat preservation and restoration makes for a unique combination that has been developed over the decades and cannot be found anywhere else. However, walking from North Island all the way to Camp Surf in Imperial Beach it is obvious that this narrow spit of sand is past the saturation point and cannot tolerate more human activity without there being a wholesale change of character. This area is overwhelmed by traffic, military, civilian and recreational activities and plainly, to me, has passed the tipping point. Sincerely, Robert E. Miller

### E.1.73 Ronald and Nancy Mires

Representing: Private Individual

Organization:

Name: Ronald & Nancy Mires

Date: 3/30/2010 4:30:27PM

Subject: Other

Comment: While everyone should be concerned about all the items on the subject list, we also should be aware that the Navy has always been a good neighbor in Coronado and tries it's best not to disrupt people's lives or the habitat more than is absolutely necessary. Coronado is a Navy town and we should be happy and proud the Navy is so prominent in our community. Some citizens may be inconvenienced by heavy traffic for a few hours each day and there may be some impact on the beaches or the birds, but it's a small price to pay for the freedom we enjoy from having a highly trained military force. We're in two wars at the moment and there is a need to train more troops..so we all need to let the Navy get on with their hard work. I know many of our neighbors who don't feel comfortable commenting publicly share our thoughts. We're behind the Navy and it's fine training operation 100%.

### E.1.74 Roland Moritz

Representing: Private Individual

Organization:

Name: Roland Moritz

Date: 3/30/2010 7:42:00PM

Subject: Public Health and Safety

Comment: As a resident in the Coronado Cays, and a retired USNR officer previously stationed on a DDR in San Diego in 1953. My new bride and I rented in Coronado during that period and decided at that time that Coronado would be our eventual retirement location. Since 1997 we have been fortunate to be living that dream. The news of the Navy's plans to impact our paradise in such a huge way comes as a great shock and disappointment to us. We have always been happy with the thoughtful and considerate presence of the US Navy in our beautiful community of Coronado. I must point out, however, that the aircraft passing overhead on their landing approach to North Island Naval Air Station does result in noticeable pollution in the air we breathe as well as the layer of fuel and exhaust deposited on our community as the aircraft pass overhead. This, when multiplied as a result of the proposed large increase in air traffic over our area will certainly result in considerably aggravated detrimental healh impact to our citizens. And, as Coronado and the Coronado Cays populations are made up of many retirees, the health impact would undoubtedly be even greater. And, of course, the added noise pollution must not be overlooked. With regard to the EIR, I would respectfully request that my concerns be received with consideration and the good Navy neighbor policy which has been appreciated over the years. Let me conclude by suggesting that a location for such a large amount of air traffic should take place in largly unpopulated areas such as the Marine Base at Camp Pendleton, and other such underpopulated areas. Sincerely, Roland Moritz

### E.1.75 Omar Nicieza

Naval Facilities Engineering Command,Southwest.
Attn.: Mr. Ken Randall-
Silver Strand Training Complex EIS,
1120 Pacific Highway,Building 1,5th. floor,
San Diego,CA.92132

Dear Mr. Randall:

I live in Montego 4,at the Cays,just in front of the ocean
I am 80 years old and my wife is 70.
I worked hard for my weekly check until I was 72.My wife did the same. and now our golden years are plagued by the excessive
noise of the helicopters that deprive me to sleep , and the intrusive black dust that keeps my wife obsessed with cleanliness
Now to crown the situation,comes your 10 years in the making draft: Lets occupy the rest of the open spaces; lets go from 700
flies to over 2,000...
I understand the frustrations of the Ministry of Defense with the uncertain results of the regular troops after many years of war
in Irak and Afghanistan.I understand that with strategic attacks with drones and tough professional Seals,we could obtain
better results...

BUT, TO PROTECT ME YOU WANT TO MAKE MY LIFE MORE IMPOSSIBLE TO LIVE ??

In my working life,I invented a motto that hanged in my office and showed to any big shot that disagreed with a position I took:

" LOGIC SHOULD SUPERSEDE AUTHORITY "

I wish you or your superiors could read it today and think about it...

Hopping for a positive replay,

Respectfully,

Omar Nicieza

Omar Nicieza

### E.1.76 Laura Orozco

Representing: Private Individual
Organization:
Name: Laura Orozco
Date: 3/29/2010 9:49:34PM
Subject: Traffic or Transportation
Comment: Hi I would just like to say that I would not be very happy if the increase in training would mean more "night flying" by planes and helicopters over our houses. The noise at night would not make any of the Cay's Resident's happy Thanks in advance for listening Thanks for your service and all that you do to keep us safe The Orozco Family

## E.1.77 Cathy Potter

Representing: Private Individual

Organization:

Name: Cathy Potter

Date: 3/29/2010 6:37:40PM

Subject: Military Training Activities

Comment: Dear Sirs, We were very disappointed to read that you are planning to expand the Navy's training program in Coronado. The areas we've seen on maps for this increased activity seem way too close the the lovely Hotel Del Coronado and the residential towers south of the hotel. It seems the increased activity and noise will be detrimental to the enjoyment and safety of the beach by residents and visitors. We strongly urge you to reconsider your plan and move the training farther down the beach or use other sights such as North Island or even Camp Pendleton away from residential areas.

## E.1.78 Ann Price

Representing: Private Individual

Organization:

Name: Ann Price

Date: 3/12/2010 11:17:17PM

Subject: Military Training Activities

Comment: Our Military is in need of every training resource it can utilize. While I am all for protecting the environment I feel that the Navy needs to have areas to train in order to protect the American people AND the environment. We need to start thinking about human life first, then nature preserves, etc.

## E.1.79 Deirdra Price, Ph.D.

March 19, 2010

Naval Facilities Engineering Command
Attn: Mr. Kent Randall
Silver Strand Training Complex EIS
1220 Pacific Highway, Building 1, 5th Floor
San Diego, CA 92132

Dear Mr. Randall,

I am a resident of Coronado and have lived in Coronado Shores for 26 years.

I recently learned that the Department of the Navy is planning to increase the levels of training at the Silver Strand Training Center. Our family hears the training that goes on throughout the year. It is already loud and obtrusive. We live under a flight path that has substantially raised its activities in recent years. Planes and now helicopters not only fly more often, they fly closer to our buildings at all hours of day and night. In the past, planes flew out further over the ocean instead of buzzing close to our residences.

To discover that you are proposing to increase training from 3926 annual activities to 5543, helicopter sorties from 800 to 2200, and firearm discharges from 150 to 1400, the noise will further disrupt peaceful living. Helicopter noise is grating on the nerves and you are expanding their sorties by nearly two-thirds.

I understand that we share Coronado island. The Navy has to take into account that you operate around civilians who live in Coronado. So your sensitivity to our home life is of utmost importance. The Navy has many facilities around the country. So if you choose to expand your training in a residential neighborhood, you must look out for the residents.

I hope you will come up with a solution that includes flying planes and helicopters further out over the ocean when training and landing as well as designing your training schedule and location to be as least intrusive as possible.

We hope for some semblance of peace and quiet in our home and neighborhood. You are the one to make sure this happens.

Sincerely,

Deirdra Price

Deirdra Price, Ph.D.
1710 Avenida Del Mundo
Coronado, CA 92118

### E.1.80 Ambassador John Price

Ambassador John Price

Tuesday, March 23, 2010

Naval Facilities Engineering Command
Attn: Mr. Kent Randall
Silver Strand Training Complex EIS
1220 Pacific Highway, Building 1, 5th Floor
San Diego, CA 92132

Dear Mr. Randall,

I am writing to you today to express my concern regarding the Department of the Navy's plan to increase the levels of training at the Silver Strand Training Center. My wife, Marcia, and I purchased unit #1507 in the La Perla tower in 1990 and have spent a considerable amount of time at the Shores with our family and friends. I am deeply concerned with the increased levels of training and the impact it would have on the Coronado Shores and surrounding community.

I would appreciate the Navy's cooperation and efforts to maintain the quiet atmosphere which currently exists at the Coronado Shores.

Sincerely,

Ambassador John Price

## E.1.81 The Sack Family

1780 Avenida del Mundo
#404
Coronado, CA 92118-4011
March 20, 2010

Navy Facilities Engineering Command, Southwest
Attn: Mr. Kent Randall
Silver Strand Training Complex EIS
1220 Pacific Highway, Building 1, 5th Floor
San Diego, CA 92132

Subject:

Expansion of Training Activities along the Silver Strand, Coronado

Dear Sir,

This family fully supports the expansion program which we have seen in the local newspapers and as received in a separate mailing to our home.

We have lived at the Coronado Shores with a unit facing the beach/ocean for many years and have nothing but respect and support for the training that goes on for the Navy Seals and associated military activities both in the ocean and on the strand.

We also would point out that those who bought property or otherwise decided to live in the area were fully cognizant of the presence and importance of the military training and associated activities in this area and do not feel that their complaints are justified.

Feel free to use/present this letter in any hearings or reviews that may be underway.

Respectfully,

Edgar A. Sack

The Sack Family

## E.1.82 Ray and Loretta Saez

March 17, 2010

Mr. & Mrs. Ray Saez
33 St. Christopher's Ln
Coronado Cays
Coronado, CA. 92118

Naval Facilities Engineering Command, Southwest
1220 Pacific Highway
Building 1, 5th Floor
San Diego, CA 92132

ATTN: Mr. Kent Randall – Silver Strand Training Complex EIS

Dear Naval Facilities, et al,

We have major concerns about the proposed expansion of increased training activity along the Silver Strand. Increasing the helicopter sorties from 778 per year to 2,200 is unacceptable. The helicopters make a significant noise when they pass anywhere near our home. We do not want to live under the conditions occurring around Ream Field. We looked at homes by the Tijuana Estuary in Imperial Beach before we purchased our home in March 1991. Homes in that area are significantly cheaper than the one we purchased because the helicopter noise is intolerable for most people. Our quality of life, health & financial situation would be decreased 100% if sorties were increased to the degree stated.

The endangered species living on the bay need to be protected in order to continue to exist on this earth. The Navy should respect that. Another consideration is the amount of noise firearm discharges create. We are sometimes awakened at night by that noise. It seems that the Navy wants to take over most of the area not already inhabited by animals and people. We agree that training our military is important but it should not be at the expense of the quality of life of those of us who live near by. Please consider protecting endangered species including humans by scaling back the training sites, helicopter sorties and firearm discharges. Let's create an environment in which we can live together as good neighbors.

Very truly yours,

Ray Saez
Loretta Saez

Ray & Loretta Saez

### E.1.83 Elizabeth Schulman

**ELIZABETH SCHULMAN**

**15 THE POINT**

**CORONADO, CA 92118**

March 23, 2010

NAVAL FACILITIES ENGINEERING

COMMAND, SOUTHWEST

Attn: Mr. Kent Randall

Silver Strand Training Complex EIS

1220 Pacific Highway

Bldg. 1, 5th Floor

San Diego, CA 92132

Dear Mr. Randall:

I have reviewed the EIS regarding the USN's proposal to intensify training along the Silver Strand. I excerpted the following two paragraphs as follows:

*Alternative 1, the Navy's preferred alternative, is designed to meet Navy and Department of Defense (DoD) current and near-term operational training requirements. It meets the selection criteria listed in Section 2.1.2. Under Alternative 1, the Navy would increase the tempo of training, introduce new platforms and systems into training, conduct existing routine training at additional locations within SSTC training areas, introduce new platforms and equipment, and increase access and availability to SSTC training areas. The tempo of training would be increased to meet 100 percent of Navy NTA requirements. This represents an increase from the baseline tempo of 3,926 activities to approximately 5,543 activities annually. New platforms and equipment would include replacement of Amphibious Assault Vehicles with Expeditionary Fighting Vehicles, an updated Offshore Petroleum Discharge System, and the MH-60R/SSeahawk Multi-Mission helicopter.*

*SSTC is located in a populated coastal area, and its use for realistic military training is constrained by adjacent residential, commercial, recreational, cultural, and sensitive natural resource uses. As part of the Navy's commitment to sustainable use of resources and environmental stewardship, the Navy incorporates measures that are protective of the environment into all of its activities. These include employment of best management practices, standard operating procedures, adoption of conservation recommendations, and other measures that mitigate the impacts of Navy activities on the environment.*

NFEC,SW
March 23, 2010
Page Two

*Some of these measures are generally applicable and others are designed to apply to certain geographic areas during certain times of year and for specific types of Navy training. Mitigation measures covering habitats and species occurring in the SSTC have been developed through various environmental analyses conducted by the Navy for land and sea ranges and adjacent coastal waters. These mitigation measures are issued to units and commands participating in an exercise.*

The EIS is long and detailed. Therefore, I stopped incorporating salient passages. The report itself states that the impact of alternative two is not substantially different than the impact of the first alternative.

While the law requires a lengthy and detailed EIS, common sense does not. The report's brief description of the adjoining areas says it all. The populated coastal area simply cannot support more than fifteen hundred additional sorties and deafening helicopter flights. The children (mostly military family kids) at the Strand Elementary School will be unable to concentrate on their studies and may likely suffer hearing impairment. The families in military housing will equally suffer from increased noise levels. Motorists will be increasingly distracted by the sorties on the beach leading to a possible increase in vehicle accidents.

An increase in the demise of wildlife seems to have been written off as "friendly fire." Exactly how many birds and sea life are expendable? Do we have a ratio demonstrating how many human lives will be spared as a result of increasing the intensity of training at the expense of wildlife?

Is the USN expecting to increase the number of recruits to be trained at the location? It appears the number of recruits is limited by demographics and the lack of a draft. The peninsula-type geography of the area limits the number of recruits who can be run through any program. The Navy Seal Program is reported to have a 2/3 "dropout rate." It appears the Navy Seal training program is sufficiently difficult.

Common sense dictates this expansion should not be approved.

Very truly yours,

Elizabeth Schulman

Cc: Coronado Eagle & Journal

## E.1.84 Teresa Scott

Representing: Private Individual
Organization:
Name: teresa scott
Date: 3/17/2010 12:41:46PM
Subject: Military Training Activities
Comment: We live in the Coronado Cays and I and my family strongly support the Navy's training requirements. You folks please do what is needed to train our fine military and we the local community will do our patriotic duty to support you. Thank you for serving our country.

### E.1.85 Timothy Searfus

Representing: Private Individual
Organization:
Name: Timothy Searfus
Date: 3/12/2010 9:42:37PM
Subject: Military Training Activities

Comment: The requirements of properly training sailors for future missions in support of our country's strategic goals cannot be subjugated to the voices of a relatively small group of people who complain about potential negative effects on marine life, noise pollution and other potential effects of increased training but in fact this group only looks out for it's own selfish interests, i.e., their over-valued coastal properties. I lived in Coronado from 1969 until 2003. "New Money" moved into Coronado in the early 80s and since then various actors have incessantly complained about the Navy and how the Navy is inconveniently disturbing their tranquility; after all, these folks paid dearly for their homes on Ocean Blvd and Coronado Avenue and they conveniently forgot about the monument at Sunset Part at Gate 5 of North Island that says the Navy's first Navy Flying School was established around 1915 at North Island. Huh, so the Navy was there first eh? The Navy bends over backwards to maintain harmony with nature and the Snowy Plover and California Least Tern are direct benefactors of Navy determination to conserve nature. Hell, if it weren't for Camp Pendleton, the Greater Southern California Megalopolis would extend from Ventura County to Tijuana. The increased training activities and concomitant construction in support of this are critical to national security and we as a people owe a debt of gratitude to the U.S. Navy.

### E.1.86 Louis Semon

Representing: Private Individual
Organization:
Name: Louis Semon
Date: 3/13/2010 6:25:02AM
Subject: Military Training Activities

Comment: My wife and I welcome all activities of the military. We have been living on Coronado both in the Cays and now downtown and found no changes in our quality of life. Continue with the great mission at hand. Thank you. Louis and Mary Semon.

### E.1.87 Robert Shugert

Representing: Private Individual
Organization:
Name: Robert Shugert
Date: 3/2/2010 9:27:02AM
Subject: Noise

Comment: I live in the Coronado Cays. I served 5 years in the US. Air Force and 5 years in the National Guard and I strongly support our Military including the U.S. Navy, U.S. Army and Marines that will be involved in increased military training in the adjacent area to my home. I am concerned about the increased helicopter noise that will result from the sunstanial increase in "sorties" down the south bay and over my home. I have "learned to live with the present noise" , but to increase it by ten times would certaintly impact my life style as well as potentially lowering the value of not only my home but the 1200 homes that exists in the Coronado Cays. I hope that when training that involves helicopters will be limited to day time hours and that the flyway be either out over the ocean or down the middle of south bay. Thank you for your consideration.

## E.1.88 Marie Simovich

Representing: Private Individual

Organization:

Name: Marie Simovich

Date: 3/18/2010 2:58:17PM

Subject: Terrestrial Plants or Animals

Comment: My comments focus on vernal pools and particularly Branchinecta sandiegonensis. 3.11.1.4.2 Please use current references from the primary literature. This section is poorly referenced and does not reflect a current and solid understanding of the subject. Give details of the vernal pool surveys that were done in reference to B. sandiegonensis including number of pools surveyed, whether surveys were both wet and dry as required by the US Fish and Wildlife Service, the density of cysts in pools, the number of seasons surveyed, the number of fillings surveyed etc. 5.10 The mitigation section lacks sufficient details to evaluate. 5.10.5 Foot traffic should be severely restricted. Any path can result in altered hydrology and potential pool drainage. Population surveys should be done more frequently than every five years. Plans should include modifications for dry years. Populations should be evaluated for viability and increasing or decreasing population reproduction via both live animals and the cyst bank. Other floral and faunal elements should be monitored. The full crustacean community should be evaluated for richness and composition and this should be included in restoration, mitigation, monitoring and criteria for success plans. Efforts should focus on maintaining not only viable populating of fairy shrimp, but a vernal pool community with species diversity appropriate for the area.

## E.1.89 Kent Smith

Representing: Private Individual

Organization:

Name: Kent Smith

Date: 3/30/2010 9:54:47PM

Subject: Geology and Soils

Comment: I have reviewed many of the outlines for and against the increased use of the Silver Strand beach for training. My opinion is undecided because there are many positives and negatives to both sides of this important and relatively permanent decision. I am concerned that no mention has been made of the fact that there are underground tunnels or observation pits that were put in place 30 years ago that may still exist between the shoreline and the roadway. These should be included in any analysis of the environmental impact. As a frequent user of that beach when it more available to the public there were two occasions when I noticed military personnel observing the ocean and beach from ground locations that had to enjoy at least six feet of excavation for it to occur. It is unlikely that these structures (if they still exist) would pose a challenge to the type of wildlife in question but a total lack of mention in an environmental impact statement is not appropriate.

## E.1.90 Yvonne Stowe

Representing: Private Individual

Organization:

Name: yvonne stowe

Date: 3/26/2010 1:26:55AM

Subject: Military Training Activities

Comment: The noise from the training that is currently going on is bad enough without more! Sometimes they come so close to the top of our three story condo building it is down right scary. Please reconsider for those of us who live near by. We can't even talk on a cell phone outdoors facing the ecstasy when the copters are going up and down!

### E.1.91 Anna Stump

Representing: Private Individual

Organization:

Name: Anna Stump

Date: 3/11/2010 2:16:27AM

Subject: Public Health and Safety

Comment: I was driving home down the Strand late the other night when out of nowhere I heard machine gun fire, pretty close. I had my car windows closed. I was very startled. If I was not a resident of the area, I would have freaked out, maybe swerved off the road in fear. I feel there should be signs warning drivers, bikers and joggers that military exercises are happening, especially at night. I've also experienced driving through heavy smoke from military beach activities that is distracting and even cuts visibility. Thanks for your consideration. Anna Stump resident, Coronado Cays

### E.1.92 Rick Taylor

Representing: Private Individual

Organization:

Name: Rick Taylor

Date: 3/11/2010 1:45:29PM

Subject: Noise

Comment: I previously lived in a beach community when the Navy upped fighter jet training flights during the war in Vietnam at a nearby Naval air station. Complaints were many and frequent, but were silenced when the CO hung a wall banner facing the residential area which was most vocal. It read, PARDON OUR NOISE; IT IS THE SOUND OF FREEDOM. That is applicable here and now, as well as a like comment re beaches and bird sanctuaries - the Navy was here first and used these beaches unfettered long ago.

### E.1.93 Kimberly Tolles

Representing: Private Individual

Organization:

Name: Kimberly Tolles

Date: 3/29/2010 4:07:39PM

Subject: Noise

Comment: As a 20-year resident of Coronado and homeowner in the Coronado Cays (and currently homeowners association board member), I am extremely concerned about the Navy's training complex proposal from the point of view of increased noise, increased numbers of aircraft, more air fuel pollution than we alreacy get, live fire next to homes and public beaches and nighttime activities. I felt the Navy's presentation before the Coronado Cays Homeowners Association Board understated the potential changes represented by this plan to the point of possibly being untruthful. I agree completely with the concerns expressed in the City of Coronado's letter and with the letter from the City of Imperial Beach. Training activities are necessary, of course, and have always been conducted in our extremely small community but to increase them to the extent proposed by the Navy amounts to reckless public endangerment.

### E.1.94 Gary Trieschman

# Department of the Navy
## Silver Strand Training Complex
## Draft Environmental Impact Statement

## Public Hearing Comment Form

Location: Imperial Beach Date: 2-23-10

**Thank you for providing comments on the U.S. Navy's Silver Strand Training Complex Draft Environmental Impact Statement (EIS).** Please provide comments no later than March 9, 2010. Comments may be submitted at the meeting, by visiting the project Web site at www.silverstrandtrainingcomplexeis.com, or via U.S. Postal Service to the address below.

create public viewing area of exercises (of course w/ security clearance) and involve public in reason for training

***Please Print***

1. Name Gary Trieschman
2. Address 442 Daisy Ave
   Imperial Beach, Ca 91932

1. Please check here ☐ if you would like to be on the mailing list.
2. Please check here ☐ if you would like your name/address kept private.

Please give this form to one of the U.S. Navy representatives, place in the drop box, or mail by March 9, 2010 to:

**Naval Facilities Engineering Command, Southwest**
**ATTN: Mr. Kent Randall - Silver Strand Training Complex EIS**
**1220 Pacific Highway, Building 1, 5th Floor**
**San Diego, CA 92132**

### E.1.95 Normandie Trovato-Wilson

There are a lot of complex factors in play when it comes to evaluating the impact this will have on endangered and threatened species. Of my particular concern is the training in the vernal pools. 90% of California's vernal pools have been destroyed due to development. I believe the Navy is committed to maintaining environmental integrity at the Silver Strand complex-however, protecting a vernal pool is not as simple as erecting a barrier around a WSP nest. There are hundreds, if not thousands, of species that coexist within vernal pools and it seems impossible to predict the effects that training in the vernal pools would have upon these species, including the endangered San Diego Fairy Shrimp. Extinction, and the loss of these sensitive habitats, is forever. Also of special concern is the fact that the California least tern is still in decline and there seems to be little explanation as to why, and there is no species recovery plan for the terns. More information needs to be gathered about the Least Terns and the Western Snowy Plovers- especially information on how the species are doing from Oceanside all the way to the border- before making a choice about the use of the 3 shipping lanes during the breeding season. There seems to be little to no mention of mitigation within the current EIS, which is also concerning. In addition, there is no mention of returning to the current state of use should Navy training levels decrease in the future. I realize the Navy is not predicting such a reduction, but there should be a stipulation that should Navy training levels decrease in the future, that the use of the land would revert to the way it is now, should the Navy end up going with Alternative #1. I compliment the Navy on their commitment to environmental stewardship. It is refreshing to see the military take such a stand for environmental integrity. It gives me hope. Ultimately, there is very little way to predict the effects that these changes would have on the WSP and the California Least Tern and until more answers are provided as to these species' progress, it seems hasty to change while these species are still making efforts to recover. A solution could be to gradually phase in these changes over the next 1-5 years and chart the progress of the endangered species. An alternative for the vernal pool training would be to conduct some training around/in a vernal pool which is in poor condition, and chart the effects (weeds, etc) of foot traffic around the vernal pools. This would also provide the Navy with time to figure out mitigation measures for the use of the vernal pools and test solutions for the inevitable problems and imbalances in the ecosystem which will result once foot traffic is allowed in the vernal pools. Thank you for reading my statement.

### E.1.96 Joan Van Der Hoeven

3-15-2010

RE:

SILVER STRAND TRAINING COMPLEX EIS

I WOULD LIKE TO SUPPORT PROPOSED NAVAL TRAINING ENHANCEMENTS ALONG THE SILVER STRAND COASTLINE OF SAN DIEGO. FAR TOO MANY OF OUR NATIONS TRAINING RESOURCES ARE COMPROMIZED BECAUSE OF PUBLIC STUPIDITY IN PURCHASING RESIDENTIAL PROPERTIES IN AREAS DESIGNATED FOR MILITARY USE. WHEN OUR COUNTRY IS AT WAR IT IS NECESSARY FOR OUR TROOPS TO TRAIN AS MUCH AS POSSIBLE FOR SAFETY'S SAKE. WAR DOES NOT RUN FROM 8-5, AND THERE ARE OBVIOUS REASONS WHY TRAINING AT NIGHT OR ON WEEKENDS IS REQUIRED. THE NAVY HAS OBSERVED HIGH STANDARDS OF HAZARDOUS MATERIALS MANAGEMENT. BEACH ACCESS IS AVAILABLE TO THE PUBLIC IN NUMEROUS ALTERNATIVE AREAS - OUR COASTAL COMMISSION ASSURES THIS. THE ADDITIONAL TRAFFIC & NOISE ASSOCIATED WITH NAVY TRAINING FOR A NATION AT WAR SHOULD BE REGARDED AS AN ACCEPTABLE CONSEQUENCE FOR PROVIDING TRAINING THAT COULD SAVE LIVES.

Joan Vander Hoeven
AICP

Joan Van Der Hoeven
2330 1st Ave. Unit 406
San Diego, CA 92101

### E.1.97 Susan and Monte Weddle

Susan & Monte Weddle
3848 Coronado Ave.
San Diego, CA 92107

Naval Facilities Engineering Command,
Southwest
Attn: Mr. Kent Randall
Silver Strand Training Complex EIS
1220 Pacific Highway, Building 1
5th Floor
San Diego, CA 92132

Dear Sirs:

We are responding to the article in the Union Tribune concerning the possible increase in the number of sorties being proposed by the navy. We sincerely hope that you will listen to our concerns.

We live in Point Loma and have been greatly concerned over the increase in helicopter and fighter jet noise. The possibility of vastly increasing the number of sorties is unacceptable to us.

We recognize the necessity for properly trained troops and we certainly appreciate what our troops do for us. But before you increase the level of noise and vibration in our neighborhood we would like some facts. You stated in the article that the recent number of sorties has been at 700+ in the past year. How many sorties were practiced in 2008 and 2007? Our guess and fear is that the number of sorties has been increasing continually over recent years.

We certainly agree that naval troops must be properly trained, but we also want the navy to continue to be good neighbors with our community. To that end, we oppose any increase in the number of sorties in Imperial Beach, Coronado, and Point Loma.

Thank you for listening. We look forward to hearing from you.

Sincerely,

Susan J. Weddle
Monte R Weddle

Susan J. and Monte R. Weddle

### E.1.98 Dewey Wells

Representing: Private Individual
Organization:
Name: Dewey Wells
Date: 3/6/2010 12:02:19PM
Subject: Military Training Activities

Comment: My wife and I have visited your area and think the strand is very nice. However, we really think military needs (as in SEAL training) must come first. We would love for our SEALS to use the strand as much as they need to for training. Keep in mind that the military is the only reason we enjoy the freedoms we do.

### E.1.99 Richard Willson

Representing: Private Individual
Organization:
Name: Richard Willson
Date: 3/29/2010 10:16:45PM
Subject: Military Training Activities
Comment: I support the Navy's expanded use of their Coronado training facilities. We must all make contributions to protect our country. Accepting some inconvenience is a reasonable contribution for the civilians of Coronado to make in support of the Navy's role in defending our county and its interests.

## E.1.100 Karen S. Wright

KAREN WRIGHT

154 Calla Ave
Imperial Beach, Ca 91932

Naval Engineering Command Southwest
Attn: Mr. Kent Randall
Silver Strand Training Complex EIS
1220 Pacific Highway
Building 1, 5th. Floor
San Diego, Ca 92132

Dear Mr. Randall:

I have lived at 154 Calla Ave Imperial Beach since 1962. I have invested a lot to improve my home. My bedroom windows overlook the Silver Strand Training Center. In all those years I have enjoyed the view and the quiet. Occasionally the navy would use the beach for landing boats and men or for running on the beach. But until the last year or so, I haven't heard gunfire, explosions, or frequent helicopters.

Now I understand the navy intends to increase the intrusive noise events. Intrusive noise events will destroy the peace of our neighborhood. Please reconsider and move the noisy training to Camp Pendleton where there is no peaceful neighborhood to destroy.

Sincerely,

Karen S. Wright

Karen S. Wright

## E.1.101 Susan Yamagata

Representing: Private Individual

Organization:

Name: Susan Yamagata

Date: 2/8/2010 8:07:19PM

Subject: Traffic or Transportation

Comment: Comments on Silver Strand Training Complex I live right next to the entrance of the Training Complex. One problem that only happens when it rains is the storm drain (It makes a 90 degree turn just to the east of the guard bldg.) and it gets plugged up and is insufficient to handle the water flow. It backs up, floods and makes a small pond then runs over your entrance road. But, the main problem these past number of years is the speed / traffic when vehicles enter or depart the base gates. I have spoken with many of my neighbors and we have contacted the city of Imperial Beach. They have used a mobil speed detector machine on occasion. But, we would like you to consider more permanent and enforceable options. A few suggestions are: 1) There is a Stop sign when exiting the base, but no one uses it. There is a speed bump when exiting the base, but anyone driving fast out of there just bottoms out a bit and continues on at a fast speed. If you would require all exiting traffic to stop at the stop sign, then cars would not be at such a high speed as they leave the base. 2) Neighbors have suggested installing a Stop sign at Silver Strand Blvd. and Carnation Ave. 3) Neighbors have suggested installing at least two speed bumps, maybe three along Silver Strand Blvd. 4) Install 25 mph speed signs. 5) Install a Pedestrian crossing that requires drivers to stop. Drivers race down the street, because they like to drive fast, they are late, or they are trying to beat the automatic gate when they see someone ahead of them already has the gate open. And this is specifically for my situation. I drive a small car and when I back out of my driveway, I cannot see down the street when there are cars parked in front of my neighbors. (There are usually vans, suvs, or large trucks.) If I am lucky I can see a little 2 foot opening between the vehicles and I sit and watch that opening to see if anything passes in front of it. But, lately there haven't even been any of those openings. In addition, I have to look towards the inside of the base to see if any vehicles are driving down the road to exit, because I know they will not stop at the stop sign. Then there is the driveway for Camp Surf right across the street, (they should put up stop sign also), because during their busy season their guests just pull out without looking to see if anyone is exiting the navy base. So, I am trying to monitor three different directions without having a clear view. Sometimes, the only thing I can do is look at the guard to see if he is looking down the street or getting up, because, then I know a vehicle is coming from at least one direction. 6) I was wondering if you could install a convex mirror outside of the base that shows oncoming traffic on Silver Strand Blvd. that I would be able to use. I know this is not really your concern, but I am afraid with increased traffic due to your plans, the odds of me making it out of my driveway without getting hit are getting worse for me. Thank you for considering my comments on your future plans.

## E.1.102 Susan Yamagata

Representing: Private Individual

Organization:

Name: susan yamagata

Date: 2/24/2010 1:10:10PM

Subject: Traffic or Transportation

Comment: I attended the Public Hearings Open House in Imperial Beach. Thank you for providing this opportunity for one-on-one discussions with representatives who could offer clarification on various topics. I spent most of my time at the Community Interests desk talking about traffic safety on Silver Strand Blvd. leading up to the entrance of the complex. They suggested that I write additional comments or suggestions. First off one of the representatives mentioned that they were uninformed about the complaints that many neighborhood residents have voiced about the speeding drag racing and problems pulling out of driveways or side streets when on-street parking blocks a clear view of oncoming traffic. Some of these problems were brought to the attention of Imperial Beach traffic control. In the past (though not for a number of years) an electronic traffic monitoring machine was placed on our street to remind drivers to slow down. I know of one time when a traffic ticket was issued but heard that it was thrown out of court as "entrapment". As part of your review, I'm guessing that you've asked the city of Imperial Beach to share any information gathered over the past seven years. I was also told that there are "warrants" that a situation must meet in order to be able to install anything from a speed limit sign to a stop sign to any other traffic control measure. Examples given were things like numbers of tickets issued, numbers of accidents, numbers of complaints, numbers of deaths. But the problem with those limitations is that after a flurry of complaints by neighbors especially about the speeding problem, nothing lasting was done to address this ongoing situation and it seemed pointless to email or call or leave another message with the City and no messages were ever responded to after calling and leaving a message at the phone number listed on the sign at the Training Complex entrance. Another problem that comes up is who has jurisdiction over street safety issues. I believe the west side of the street at Camp Surf might belong to Coronado and the rest of the street is the responsibility of Imperial Beach. It would benefit the neighborhood if all three parties including the Navy would join together to try and address residents' concerns. I have a feeling that many people who have complained about the traffic in the past have not taken part in this "Comment" opportunity. It would serve community relations if additional outreach was attempted. I suggest that you ask the city of Imperial Beach to set up the electronic message board on Silver Strand Blvd. closer to Palm Avenue so that the people coming out of the other side streets will see it. If you flashed a message: "Traffic safety issues? Please comment here or visit www.silverstrandtrainingcompleseis.com." And then provide a drop box and blank comment forms right next to the sign. I have seen parents with young children crossing Silver Strand Blvd. on there way to the school just around the corner. They do not always go down to the corner crosswalk, because there is a little parkway next to the El Tapatio Restaurant that is a shortcut. In my previous comments I submitted I listed "pedestrian crosswalks" (maybe like the kind with signs that are on Seacoast Drive?) Another traffic issue is pulling out onto Palm Ave. from Silver Strand Blvd. It seems that there were more street parking spots added on Palm which can cut down on visibility to see oncoming traffic. There are stop signs at 3rd and to the west on Palm Ave. at the corner of the 2nd. With planned increase in traffic for the Complex it would help if you would consider a traffic light or a three-way stop at the corner of Palm and Silver Strand Blvd. If all else fails and Silver Strand Blvd. does not meet the "warrants" to take any traffic control actions, I suggest that the Navy consider using temporary signs. In the past I have spoken to some of the trainers who work at the complex. They told me that every time a new group comes in to start training, they give a speech about speeding and other traffic do's and don'ts when traveling through this neighborhood, but that the majority of participants are young and full of fire and will on occasion disregard these warnings. Maybe at the beginning of each training period a set of temporary signs could be used on the exiting side of the street. Example: First and foremost an enforced "STOP" sign before exiting the base. Then a "25 mph" speed limit sign. Then a friendly reminder that you are driving through a "Neighborhood". I have run out of room on this form and will finish my comments on another form.

Comment: continuing my comments from previous comment form ID # 8-650-1 ... But, the problem with this is it doesn't address cars coming into the base or problems with visibility for residents to pull out of side streets or their driveways when you're not sure how fast a car might be coming down the road. Also, if the warrants are not met for street signs etc. then maybe the Navy could install signs like those listed above on their property before the exit gate, then you wouldn't have to meet the warrants? My last suggestion is that you check the schedule for planned complex activities, then come down and sit in your car on our street and see for yourself. The street is not always busy, but traffic is heaviest in the a.m. as trainers and participants are arriving or later when leaving after a training exercise. This visit would not take into consideration the after hours traffic throughout the night or over the weekends. Thank you in advance for at least considering these issues and concerns. I'm hoping that this time some discernible action will be taken to alleviate some of the unsafe traffic situations.

## E.2 COMMENTS FROM ORGANIZATIONS

The comments in this section were received in written form by organizations, agencies, tribes and individuals

### E.2.1 Airport Trust

LEON E. CAMPBELL
ATTORNEY AT LAW
7825 FAY AVENUE, SUITE 200
LA JOLLA, CALIFORNIA 92037
TELEPHONE (858) 459-4064
FAX (858) 454-8636
puente1888@aol.com

February 24, 2010

Naval Facilities Engineering Command
Southwest
Attn: Mr. Kent Randall-Silver Strand
Training Complex EIS
1220 Pacific Hwy, Building 1, 5th Floor
San Diego, CA 92132

Dear Mr. Randall:

I represent Donald W. Rogers, Trustee of the Airport Trust, a private trust which has the proprietary interest in an exclusive license under Patent No. US 7,469,859 B1. The patent was issued on December 30, 2008 and describes an airport design having three 12,000 foot runways, a 2,000 acre footprint, two levels surrounded by water, access to the shore by underwater tubes and located in South San Diego Bay.

Enclosed are (1) Aerial photograph of the bay with the airport superimposed; (2) Description of Proposed Airport dated February, 2010; and (3) Copy of patent.

The site of the airport has been carefully selected to avoid interference with marine traffic, habitats, other air traffic and is outside the amphibious base security zone.

The trustee welcomes the expanded use of the Silver Strand provided it does not conflict with the proposed airport. At this time no conflict is apparent except amphibious operations within the bay which would involve water area within the boundaries of the airport.

The proposed airport includes a second entrance to the bay, as shown in the photograph. The advantages are discussed in the description. Such advantages include its use for military vessels. The second entrance is not essential for the proposed airport, but would have beneficial effect to the area, including environmental benefits.

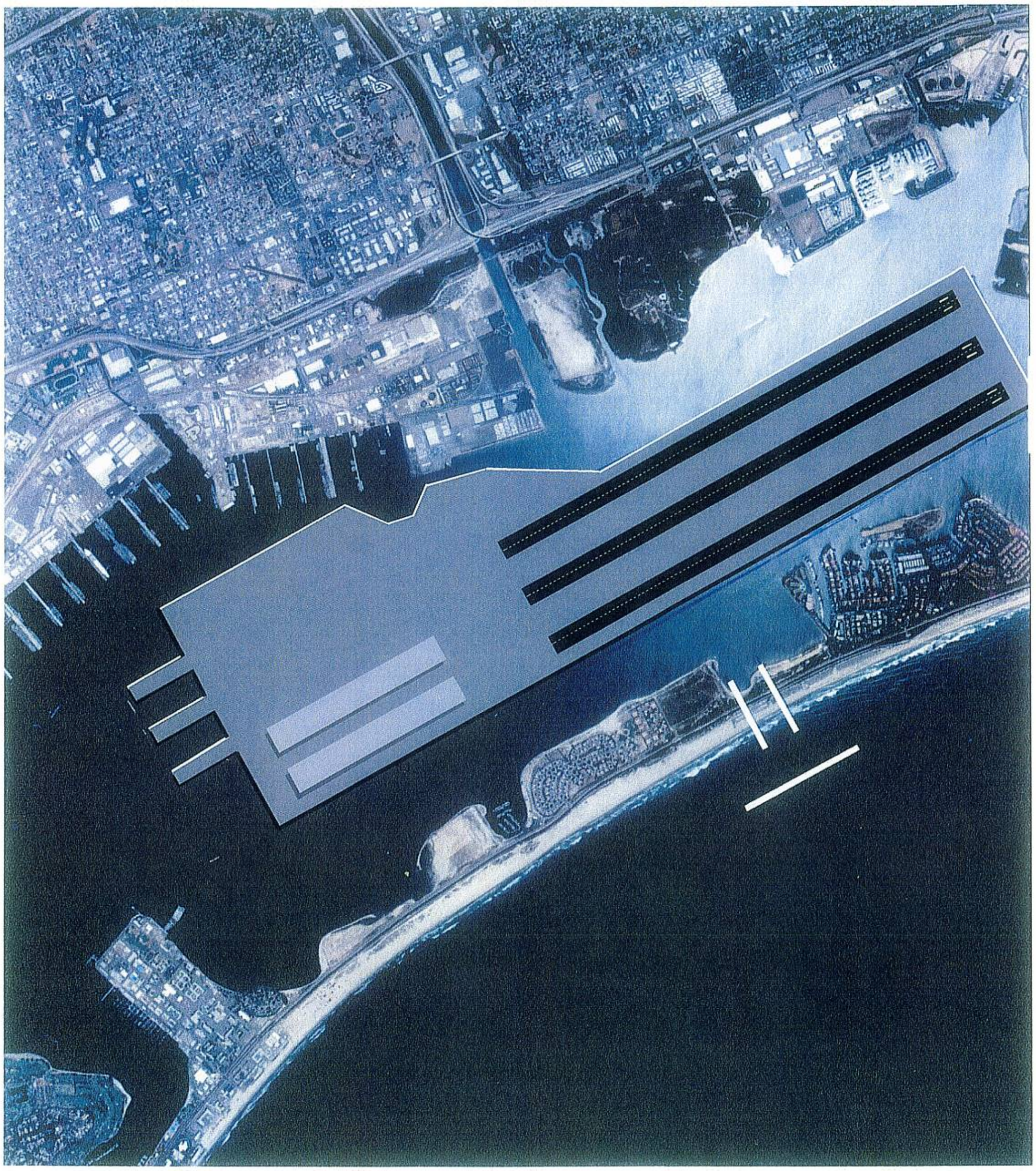
Over 50 years have been spent and recently over $17 million in a futile effort to find an alternate airport site to Lindbergh Field which will reach its capacity circa 2020 with no room to expand with any additional runways. The proposed airport is the *only* feasible solution.

It is requested that any expanded use be consistent with the proposed airport.

Sincerely,

LEON E. CAMPBELL

# Proposed New San Diego Airport Footprint



### E.2.2 California American Water

CALIFORNIA
AMERICAN WATER

Mr. Kent Randall
Naval Facilities Engineering, Southwest
Silver Strand Training Complex, EIS
1220 Pacific Highway, Building 1, 5th Floor
San Diego, CA 92132

Dear Mr. Randall,

I recently read in the San Diego Union-Tribune, the Monday, Februrary 22nd edition, that the Navy is utilizing a larger amount of the property on the Silver Strand Training Complex and will be having a larger footprint of operations at that site. I would like to remind those of you responsible for this property that California American Water Company has a 16" cast iron water main that traverses the base from the south end to the north end of it. This main provides a connection between Imperial Beach and Coronado, feeding the Coronado Cays along with the Navy Base. This main was installed in 1912 and has been in continuous service since then. I would make you aware of this critical main so that you always take into consideration the location of the main when you make plans to install new infrastructure on the base. Last year at the very north end of the base there was some sort of large poly-ethylene pipeline bored from the road to the Pacific ocean. It was bored in very near proximity to our 16" main and I believe we all dodged a bullet when that main was not damaged. Also, there are a number of vehicles parked in the same area near the fence along Hwy 75 on a day to day basis that are adjacent to two air/vaccum valves we have on the 16" main. I would hope that the vehicles never hit one of those valves and knock them off as it would create a bit of damage and cause us to shut down the 16" main which would put the base out of water and create a low pressure issue in the Coronado Cays. Thank you for your consideration with regards to my comments.

Wayne A. Leisch

Wayne A. Leisch , Operations Supervisor
(P) 619.435.7504 (C) 619.571.5279

### E.2.3 California Coastal Commission

STATE OF CALIFORNIA – NATURAL RESOURCES AGENCY ARNOLD SCHWARZENEGGER, *GOVERNOR*

**CALIFORNIA COASTAL COMMISSION**
45 FREMONT STREET, SUITE 2000
SAN FRANCISCO, CA 94105-2219
VOICE AND TDD (415) 904-5200

March 18, 2010

Kent Randall
Silver Strand Training Complex EIS Project Manager
1220 Pacific Highway
Building 1, 5th Floor
San Diego, CA 92132

Re: Coastal Commission Staff Comments, U.S. Navy Draft EIS for the Silver Strand Training Complex (STCC)

Dear Mr. Randall:

Thank you for the opportunity to comment on this DEIS. We agree with the Navy that the proposed expansion of training at the STCC will affect coastal zone resources, and we appreciate that the DEIS states that the Navy will submit a consistency determination for these activities. Please consider these comments in preparing your consistency determination.

Our most significant concerns are: (1) overall increases in noise levels from the large increase in levels of training activities, and in particular, the effects of such noise on habitat and public recreation; (2) expansion of training into currently protected sensitive habitat areas, in particular: (a) least tern and snowy plover nesting areas in Boat Lanes 8-10 in STCC-North (which are currently off limits to training during the nesting season); and (b) vernal pools in STCC-South; and (3) the proposal to limit the number of plover nests to be protected to no more than 22 nests. Despite the length of the document, it remains unclear as to why these decisions have been made and how decision criteria will be analyzed to determine whether such training is needed in these areas.

The Navy has narrowly construed the available alternatives being considered, in terms of those brought forth in the final analysis. The extensive increases in loud activities warrants serious consideration of conducting at least some of them, including the more intrusive ones, in less heavily populated areas, for both social and resource protection reasons. If the Navy does proceed as proposed, it will need to provide a more detailed and compelling explanation to establish that there are no available less damaging alternatives. We understand the concept of keeping training near the home base, but given that Camp Pendleton is within the same county, a clearer explanation is needed for dismissal of use of this site for the activities proposed in sensitive areas. Stating it is rejected based on the need to "achieve training tempo requirements" does not provide the reviewer with any information with which to assess this assertion.

DEIS Comments
Navy SSTC
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We understand that decision-criteria were used and are listed in the DEIS (on page 2-1). However the analysis explaining why the criteria are applied in certain situations (e.g., a statement on page 2-2 is that relocating some activities to STCC-S would conflict with criteria 2 and 6) is not provided. Also, we note that page ES-5 states the Navy bases its need projections on models of future exercises. While we inherently support and understand the Navy's need to train, without the modeling assumptions and additional information, it is difficult to weigh future training needs against environmental and social impacts.

Given that the Navy is proposing a significant expansion of training, which will increase conflicts with habitat protection, it would appear that listed species such as snowy plovers and least terns warrant *increased* protection, whereas the DEIS appears to be proposing simply to maintain the status quo (at least with respect to the number of snowy plover nests). We would argue that the increase in activities in Boat Lanes 1-7 would seem to make it all the *more* imperative that these species have an area set aside (during the nesting season) and left undisturbed.

Alternatives eliminated from further consideration include training at locations other than the STCC. It is not clear why proposed training in Boat Lanes 8-10 during the nesting season, which the Navy estimates (based on its models) to occur approximately 24 times/year, could not be relocated to Camp Pendleton, or why Camp Pendleton beaches could not "provide a realistic training environment that simulates real world littoral combat conditions."

The criteria provided by the Navy (DEIS, page 2-34) indicate these Boat Lanes would be used either: (a) when other suitable lanes are occupied, or (b) "if [lane] attributes make them more suitable for meeting training needs than other available training lanes." Examples of such attributes include beach topographic conditions, distance from other training locations, and a need for diversity in training locations. These criteria appear overly broad, and we believe there should be a much greater burden needing to be satisfied before the Navy would use these lanes. We question why, for example, if the Navy is able to modify beach topography for the purpose of attempting to discourage nesting in heavily trained areas, the Navy is not also able to modify beach topography to provide desired *training condition* topography in other areas (and thereby avoid Lanes 8-10 during the nesting season). If feasible, such an alternative should be explored for both Camp Pendleton beaches, as well as the remaining Boat Lanes at the STCC. If infeasible, the Navy should explain why.

The Navy's stated argument for eliminating the alternative of protecting all the snowy plover nests, rather than limiting protection to only 22 nests, is not well explained. Stating a third nest in a given training lane "could render the entire lane unusable" appears speculative, depending on the location of the nests. We would like historic information about conflicts the Navy has experienced in training in these lanes over, say, the past decade. For example, how often have there been more than two active plover nests within a given lane, and what has this meant for Navy training? Has the Navy had to cancel, modify, or relocate training? Is it a given that more than two active nests in a lane at one time makes the lane unusable? If

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so, please explain. Wouldn't the location of the nests (including proximity to each other, as well as to nests in other lanes) have an important bearing on this question? Has the Navy been able to successfully train in a lane when nests have exceeded two in that lane?

In addition, if there were greater numbers of nests, but most of those were in Lanes 8-10, which the Navy indicates would be used sparingly, then would it not be easier to protect more than 22 nests? Also, it is not clear how the number 22 was derived, when there are 14 Boat Lanes. If the number was derived from the number of lanes times two nests/lane, shouldn't that total be 28 nests?

It is also not clear from the document how the Navy intends to phase in the increased numbers of activities. If the timing of the increases allows sensitive areas proposed for training to be off limits for several years (or some other period) until they are needed, that should be considered as an alternative as well, or at least explained. We recognize that the Navy states these areas will not be used unless needed, but it would be helpful to understand the pace of the proposed increases.

We have similar concerns over the proposal to expand training to allow foot traffic in vernal pools. The DEIS does not make a compelling case that these pools could not be avoided. At a minimum, it is not clear why fencing (and thereby avoidance) of at least the smaller vernal pools could not be conducted consistent with training needs.

It appears from the discussion in several sections of the DEIS that the primary reason for dogs on the beach is for their exercise, and the primary *training* activities necessitating dog use occur at or near buildings (i.e., away from beaches and sensitive areas). We understand that the dogs are trained not to disturb wildlife, but wildlife may still be intimidated by dogs to the extent they could abandon nesting areas, especially in the cumulative context of overall increases in training levels. Is there a reason, for example, why dog runs could not be excluded from Boat Lanes 8-10 during the nesting season, with their exercise limited to other areas?

Page 3.6-24 states that loud activities would occur infrequently at night or on weekends. Can the Navy provide an estimate of the amount of proposed increases in loud noise-producing activities on weekends, holidays, and at night?

The reference on page 3.6-25 to noise mitigation (referring to Section 3.6.2) is presumably meant to be a reference to Section 3.6.1.6. Also, that section is rather vague. We would appreciate it if the Navy would spell out in greater detail how noise effects on sensitive species and on recreation will be factored into decisions on locating and timing training.

Page 3.9-12 discusses marine mammal monitoring during underwater detonations and pile driving. The discussion should describe how much training the marine mammal observers will receive. Also, we will want to be added to the list of entities contacted in the event of an

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observed marine mammal injury. We will also want to receive any monitoring reports on snowy plover, least tern, and/or vernal pool habitat impacts that the Navy may be providing to the U.S. Fish and Wildlife Service.

Page 3.1-15 references a new activity affecting public access, referenced as N14. New activities are only numbered N1-N11, so this may be a typo. Please identify this activity.

Page 3.12-26, Fig. 3.12-11, contains a graph showing plover nesting through 2008. Does the Navy have 2009 data for snowy plover nest numbers? If so, please provide, for all the sites shown in Fig. 3.12-11. Also, are there any plover nests yet this year? Please keep us apprised of current nest numbers and locations as the season progresses.

The City of Coronado's comments on the DEIS (Item No. 27) state that the ferry service to NASNI has been discontinued. As this service was, in part, mitigation for traffic impacts from the homeporting of nuclear aircraft carriers, please update us on the status of the ferry service.

Page 3.7-44 contains an error message.

Thank you for this opportunity to comment on this important Navy DEIS. If you have any questions about these comments, or about preparation of the Navy's upcoming consistency determination, please feel free to contact me at (415) 904-5289.

Sincerely,

MARK DELAPLAINE
Manager, Energy, Ocean Resources
and Federal Consistency Division

cc: San Diego District Office (Deborah Lee)
U.S. Fish and Wildlife Service
National Marine Fisheries Service
Cities of Coronado and Imperial Beach
California Dept. of Parks and Recreation
California Dept. of Fish and Game

### E.2.4 California Department of Fish and Game



capacity, the Department administers the California Endangered Species Act, the Native Plant Protection Act, as well as other provisions of the California Fish and Game Code and Title 14 of the California Code of Regulations that afford protection to the State's fish and wildlife. The Department is also responsible for marine biodiversity protection and restoration in coastal marine waters of California. Pursuant to our jurisdiction, the Department would like the following concerns and issues regarding the project adequately addressed in the Final Environmental Impact Statement (FEIS).

**Biological Impacts and Mitigation Strategies**

Increasing repetitive Navy training activities along with decreasing existing conservation measures may cause long term impacts and significantly add to cumulative impacts to terrestrial and marine species and their habitats. The Department has the following comments, concerns, and recommendations: 1) the FEIS should more fully analyze and address the potential cumulative or long term coastal ecosystem impacts associated with each phase and type of the proposed increased training/construction; 2) the FEIS should include additional studies and/or increased biological monitoring, additional conservation measures, and mitigation plans for the potential long term impacts to listed and sensitive terrestrial and marine species, rare and unique coastal strand habitat, and State- and federally-listed marine birds and their nesting habitat. 3) the Department views the Navy's proposed mitigation and decreases in avoidance and minimization measures for sensitive or listed species and the sensitive coastal strand, dune and eelgrass habitats, as insufficient protection and compensation from cumulative impacts.

1) Cumulative or Long Term Impacts not fully Addressed in the DEIS:

The FEIS should address the potential for the following types of impacts and show how they will be avoided, minimized, mitigated and monitored for SSTC-North and South and Bayside Training Ranges as applicable:

- During bird nesting and California grunion (*Leuresthes tenuis*) spawning season the fully protected and state and federally endangered California least tern (*Sternula antillarum browni*) and the California species of special concern and federally threatened Western snowy plover (*Charadrius alexandrinus nivosus*) as well as other sensitive bird species and their habitats may potentially be impacted due to the proposed significant increases in vehicle, air and foot/dog traffic in the intertidal and upland areas of SSTC-North and South and bayside. A proposed buffer zone limiting bird nesting distribution and a proposal to eliminate sensitive habitat markers is described in the DEIS and indicates that the Integrated Natural Resources Management Plan (INRMP) for this area has been revised recently to support such a proposal. The Department was not aware that the Coronado INRMP (2002) was revised recently to support and accommodate a reduction in bird conservation. Additionally, the biological resource discussion does not clearly identify an analysis on how these sensitive species could potentially be affected due to cumulative impacts.

- After near shore disturbances, (training activities and construction), an increase in opportunistic, non-native, terrestrial and marine species may be seen within the project vicinity. An increase in non-native species would cause

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increased disturbance of ecosystem processes and decreased native biodiversity. This may be due to spreading/dispersal of non-native species during construction or from non-native species aggressively taking advantage of a newly disturbed area.

- Significant and repetitive vehicle, helicopter, and detonation impacts to terrestrial and marine biological resources, including sensitive and listed birds, may occur at the site causing cumulative impacts. Some of these effects may include the destruction of marine plants and algal species and their substrate such as surf grass, eelgrass and kelp species. Vehicle impacts from driving in the intertidal and on the beach may cause impacts to the kelp wrack on the beach used for forage and shelter by various terrestrial and marine species, including western snowy plovers that feed primarily on terrestrial and aquatic invertebrates (brine flies, brine fly larvae and brine shrimp). Significant burial or destruction of fish and their habitat from detonations may also occur at scattered rock bottom habitats that are found immediately offshore of the project site, thus reducing the prey base for California least terns that feed primarily on small fish. Vehicles may also impact active California least tern, Western snowy plover and other listed and sensitive bird eggs, chicks and nests. Helicopters flying over actively-nesting California least terns and western snowy plovers may flush adults off the nest and leave the eggs and chicks vulnerable to predation.

- Coastal strand habitat is an important and diminishing California natural resource and supports a unique ecological community (Dugan and Hubbard, 2009). The DEIS does not discuss the impacts to biodiversity and the uniqueness, importance and sensitivity of strand habitat nor how it should be conserved due to proposed increase in impacts.

- Significant fragmentation of marine and onshore habitats may occur due to the proposed increase in training activities and detonations in the intertidal, subtidal and upland. This may cause a reduction in habitat suitable for native species distribution especially as it relates to eelgrass on the bayside training range and onshore sensitive bird breeding, roosting, and foraging habitat.

- There are known Pismo clam, *Tivela stultorum,* beds near SSTC-North and South training ranges that are surveyed by the Department every year. Invertebrates are an important part of near shore and beach ecology. In particular, Pismo clams, a state managed and sensitive species, tend to develop high concentrations or beds on flat beaches in the surf zone and at the mouths of bays, rivers and estuaries. This makes them more susceptible to Navy vehicle training, detonations or burial impacts. Impacts to Pismo clams, as well as other concentrations of marine invertebrate species, should be identified, monitored and mitigated. The DEIS should have addressed the potential for these types of impacts.

- Sea level rise should be analyzed and addressed in the FEIS as a potential cumulative impact to unique and dwindling coastal strand habitat, eelgrass habitat and bird nesting habitat on beaches in southern California.

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2) <u>Concerns and Recommendations related to Potential Cumulative and Long term Impacts:</u>

Since the property leased by the Navy at SSTC-North is state-owned property and SSTC-South and bayside is adjacent to Silver Strand State Beach, the Department expects that a higher level of adherence to standard practices, as well as proposing additional mitigation and conservation measures for protecting sensitive coastal ecosystems and biological communities, will be practiced by the Navy as the tenant and neighbor of such land. The following comments and recommendations should be considered and addressed in the FEIS:

- Mitigation for 1.13 acres of eelgrass habitat loss is proposed in the DEIS based on Navy estimates. An enhanced monitoring and surveying program is recommended for the remaining eelgrass habitat that may be adversely affected before, during and after the proposed training activities and construction. The Department is concerned that the actual impacts to eelgrass and eelgrass habitat in this area may be significantly higher at the bayside Navy training range due to cumulative or long term impacts of proposed increased training.

- Monitoring plans that incorporate adaptive management for developing marine wildlife and habitat conservation measures are recommended. Monitoring plans should be developed in collaboration with the resource agencies. Experienced and qualified independent biologists should be retained to adequately implement the biological monitoring and studies.

- The Department recommends marking and avoiding all western snowy plover and California least tern nests and any suitable nesting habitat to offset impacts to these species that may occur as a result of the disturbances and activities (e.g., foot and vehicle traffic) associated with military training exercises.

- Existing buffer zones and signs to designate sensitive habitat (e.g., for California least tern and western snowy plover) should continue and be increased in the future for the proposed training increases on State property.

- The project should include a vehicle route plan that sufficiently avoids and minimizes impacts to sensitive species and habitats. The vehicle route plan should include, but not be limited to, the following areas: a) pismo clam beds and grunion nests; b) identified sensitive bird breeding, roosting, and foraging habitat and other significant biological areas of the intertidal, strand, and dunes; and c) beach wrack and eelgrass.

- Helicopters flying over actively-nesting California least terns and western snowy plovers should stay at least 500 feet above the ground to avoid flushing adults off the nest and leaving the eggs and chicks vulnerable to predation.

- To assess impacts of training activities on the California least tern and western snowy plover, the Department recommends annual documentation of the distribution of California least terns and western snowy plovers at SSTC-N in relation to the timing, number, type, and distribution of training activities in each training lane during the breeding seasons for these sensitive species.

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- The Department recommends increased enforcement of civilian and non-training trespass at SSTC-N to reduce impacts to the California least tern and western snowy plover.

- The Department recommends that the FEIS address the potential occurrence of Pacific pocket mouse and coast horned lizard, and the potential for long-term conservation of these species on-site.

- Grunion season monitoring and avoidance/minimization strategies should include but are not limited to the following:

  a. When grunion monitoring surveys indicate grunion habitat exists on site, and significant grunion runs are seen, avoid sand disturbing activities during the grunion spawning season. The Grunion spawning season is typically March 1st to August 31st.

  b. If avoiding the grunion spawning season is not feasible, then the Department recommends development of spawning and egg avoidance, minimization and monitoring plans for significant spawning events on site.

  c. Predicted grunion spawning runs should be monitored prior to, during and post training or construction by a qualified grunion biologist.

  d. Avoid sand disturbing activities in the intertidal areas during the two-week incubation period after significant spawning runs are seen. Subsequent monitoring should also indicate that no additional spawning has occurred before proceeding with sand disturbing activities. Identifying and marking grunion nests and use of buffer zones is another avoidance option.

  e. In order to determine significant grunion spawning on the beach, monitoring plans should generally include four nights of monitoring with the first night being the night of the new or full moon. At least two hours of monitoring, the first day to begin after the peak high tide and the 2nd, 3rd and 4th days of monitoring should begin at least one-half hour before peak high tide. Two hundred grunion or more seen over the four day predicted spawning run beginning with the night of the new or full moon should be sufficient to indicate significant spawning activity.

3) Conservation Planning for Future Impacts to Listed and Sensitive Marine and Terrestrial Species and their Habitats.

The Department recommends that existing methods and criteria to designate species buffer zones and sensitive habitat should be revised to provide adequate fish and wildlife protection in order to accommodate the Navy's future proposed activities on and adjacent to state property located at SSTC-North and South and the Bayside. Such proposals should be approved by the resources agencies.

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The Department appreciates the opportunity to review and comment on the DEIS. As always, the Department is available to discuss our comments and concerns. For marine issues, please contact Ms. Loni Adams, Environmental Scientist, at (858) 627-3985 Marine Region, 4949 Viewridge Ave., San Diego, CA 92123 or ladams@dfg.ca.gov. For bird and terrestrial issues, please contact Ms. Nancy Frost, Associate Wildlife Biologist, at 858-467-4208, South Coast Region, 4949 Viewridge Ave., San Diego, CA 92123, or nfrost@dfg.ca.gov .

Sincerely,

Marija Vojkovich

Becky Ota for Marija Vojkovich
Regional Manager, Marine Region

cc: Ms. Sandy Vissman, Fish and Wildlife Biologist
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Ms. Therese Muranaka, Associate State Archaeologist
California Department of Parks and Recreation, SD Coast District
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Ms. Vicki Frey
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Eureka, CA 95501

***REFERENCES***

*Dugan and Hubbard. 2009. Loss of Coastal Strand Habitat in Southern California: The Role of Beach Grooming. Estuaries and Coasts Journal. January, 2010. Pg. 1-11.*

### E.2.5 California Department of Parks and Recreation

Representing: Organization

Organization: California Department of Parks and Recreation

Name: Therese Muranaka

Date: 1/26/2010 6:57:31PM

Subject: Cultural Resources

Comment: As the California Department of Parks and Recreation archaeologist (Silver Strand State Beach) assigned to comment on this EIS, may I have contact information for your cultural resources staff for specific questions prior to my formal comments? Therese Muranaka, Ph.D., R.P.A. Associate State Archaeologist California Department of Parks and Recreation San Diego Coast District 4477 Pacific Highway San Diego, CA 92110 619-778-2553 tmuranaka@parks.ca.gov

### E.2.6 California State Parks

STATE OF CALIFORNIA - RESOURCES AGENCY Arnold Schwarzenegger, Governor

DEPARTMENT OF PARKS AND RECREATION
San Diego Coast District
4477 Pacific Highway
San Diego, CA 92110
(619) 688-3260 FAX (619) 688-3229

RUTH COLEMAN, DIRECTOR

March 9, 2010

Kent Randall
Naval Facilities Engineering Command Southwest
Code: OPME
2730 McKean St. Bldg. 291
San Diego, CA 92136-5198

Dear Mr. Randall,

California State Parks (CSP) appreciates the U.S. Department of the Navy (Navy)'s commitment to resource conservation in the southern San Diego region. This commitment is particularly evident with respect to conservation of California least tern and Western snowy plover. CSP appreciates the effort put into the Silver Strand Training Complex Draft Environmental Impact Statement (Draft EIS), including its documentation of our region's natural and cultural heritage and its review of the complex responsibilities charged to the Navy. CSP has several concerns with the proposed project with respect to sensitive species conservation, adequate mitigation for impacts to sensitive species, lack of specificity concerning increased presence of emissions and hazardous materials, and potential impacts to marine life within the adjacent off-shore property that is considered part of Silver Strand State Beach. This letter also includes comments on cultural resources for lands adjacent to park holdings, and questions the effects of increased ground and air traffic on the experience of visitors at Silver Strand State Beach.

The Draft EIS proposes:

- the continuation of current training and test and evaluation activities conducted within the study area;
- an increase in training tempo from baseline conditions and additions to types of training;
- the carrying out of existing, routine training at additional locations within SSTC established training areas;
- the introduction of new platforms and equipment;
- increased access and availability to existing beach and inland training areas.

Noted in section 3.1.1.5.2 SSTC-N Surrounding Land Use, and elsewhere throughout the document, the text and figures incorrectly refer to "Silver Strand State **Park"**, instead of the correct title of "Silver Strand State Beach". In addition, the document omits recognition of the Silver Strand Natural Preserve. A Natural Preserve is a CA State land designation used to identify the presence of highly significant natural resources. CSP feels that the Draft EIS should include specific mention of this land designation and also, where appropriate, denote its boundaries in figures within the document. Similarly, the Draft EIS should note the extent of marine area managed by CSP. California State Parks holds fee title to off-shore lands, 3 miles out, that include, roughly, boat lanes 3 through boat lane 10 and extends to the southern end of

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Silver Strand State Beach. CSP should be both considered and listed as an "affected jurisdiction" on the EIS Cover Sheet, and throughout the document as a whole.

CA State Parks understands that the Navy must allow for a significant level of flexibility when forecasting training needs, however we also feel that take of endangered species should be avoided or mitigated appropriately. The proposed expanded use of the training grounds, especially Beach Blue 2, Beach Orange 1, and Beach Orange 2, will most likely result in take of California least tern and Western snowy plover, and deter and disrupt current levels of nesting. CSP feels that the proposed mitigation for this take offered in the Draft EIS is inadequate to meet the standards of the U.S. and California State Endangered Species legislation. The Draft EIS lacks specificity with respect to training activities to adequately quantify potential take of protected species. Therefore, identification of an appropriate mitigation agreement prior to project implementation is difficult. Although options exist for additional on-site mitigation and avoidance, and those options should be further explored, we offer the following suggestions for a potential off-site mitigation scenario:

1. Commit to increased level of avian monitoring necessary to accurately quantify take of tern and plover resulting from the proposed actions in the Draft EIS.
2. Continue consultations with USFWS to develop an adaptive management agreement in which take of tern and plover is appropriately mitigated through suitable actions. Based on the success the U.S. Navy has had with the establishment of the 75-acre preserve at Delta North and South, it seems that a similar mitigation scenario could offer the appropriate long-term mitigation. Opportunities exist in the region for creation of additional off-site nesting locations.

It is the understanding of CSP that the Navy's current Western snowy plover avoidance protocol involves the buffering of each snowy plover nest that is located during the breeding season. The Draft EIS proposes to reduce this management action such that only 22 concurrent plover nests are buffered. This proposed decrease in avoidance measures, when coupled with the proposed increase in training, presents a management scenario in which take of Western snowy plover, above current levels of take, seems likely. The Draft EIS does not appear to include adequate mitigation for this increased take of Western snowy plover.

CSP ownership at Silver Strand State Beach extends 3 miles out to sea. This off-shore portion of Silver Strand State Beach generally includes Boat Lanes 3 through 10 and is adjacent to Boat Lane 11, which immediately borders Silver Strand SB to the south. The EIS fails to adequately consider the effects on this area or proposed appropriate mitigation of its actions. This area was created to ensure the public's continued enjoyment of the coastal marine environment. It is the Navy's responsibility, as part of the EIS, to delineate this state ownership and to evaluate the EIS proposals' potential effects on the public's use of this off-shore area.

In addition, the 3-mile marine area is eligible to be designated as a State Marine Protected Area. While CSP appreciates the consideration of marine life already included within the Navy's

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protocol for disruptions to the under-water acoustic environment we are concerned that existing activity and increases proposed in the Draft EIS will result in additional harm to marine life that use waters managed by CSP. CSP requests that activities involving acoustic disturbances known to damage marine life (pile driving, underwater detonations, SWAG operations, blasts, pyrotechnics, etc.) be located at distances far enough from ocean waters managed by CSP such that impacts to resources within these waters are avoided.

Current and increased naval activity in SSTC South, particularly in Beach White 1 and Beach White 2, may result in disturbance to Western snowy plover dependent upon protected habitat within the adjacent Silver Strand Natural Preserve, managed by CSP. CSP requests that the Navy inform CSP staff of training activities in this region such that CSP staff can accurately monitor potential impacts from these adjacent land uses. If negative effects are documented, CSP requests that the Navy work with CSP and USFWS to mitigate these negative effects.

CSP appreciates the Navy's assistance with the clean-up of expended materials that occasionally wash to shore on SSSB and the SSNP. CSP is concerned that some of the activities proposed in the Draft EIS will result in additional occurrences of munitions constituents and other expended materials on the public beaches managed by CSP. CSP requests that the Navy continue this cooperation and allow for increased communications and response for clean-up of future expended materials found on SSSB and SSNP. Additionally, CSP requests that Navy staff work with CSP interpretive staff to identify interpretation needs and public education and outreach necessary to protect the visiting public and CSP staff from these potential dangers.

CSP is concerned that the activities proposed in the Draft EIS will result in Naval activity (training exercises, aircraft fly-over, beach landings, traversing from SSTC North and SSTC South, etc.) on or over SSSB and SSNP. CSP is a public safety agency and as such is committed to protecting the resources and visitor experience on these beaches. CSP requests that any desired increased use of CSP-managed lands be approved by the CSP San Diego Coast District Superintendent prior to initiation.

The natural landform and habitat present within SSTC South is extremely unique and regionally rare. The Draft EIS proposes increased impacts to this valuable resource but fails to propose adequate mitigation. The proposed training in the vernal pools exemplifies this oversight. Every effort should be made to protect the vernal pool resources and other unique habitat elements found in SSTC South. Proposed activity within the vernal pools when dry has the potential to disrupt the soil integrity and the long-term sustainability of this habitat, the plant life and the San Diego fairy shrimp that occupy this niche. If the Navy must increase training within the sensitive habitats of SSTC South, the impacts should be quantified and appropriate mitigation measures should be undertaken.

Table 3.3-4, "Operational Emissions at SSTC and Portions of NASNI with Evaluation of Conformity" reports emissions increases of monitored pollutants at levels anticipated to be up to nearly 4 times the 'No Alternative' emissions estimation. Additionally, the Draft EIS mentions hazardous air pollutants (HAP's) but provides inadequate data for assessment of the current level

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of HAP's emitted by Naval activities and anticipated proposed increases. Given these proposed increases, and the apparent lack of data on HAP's, CSP feels that the Navy should increase its commitment to monitoring and reporting air pollutants throughout the region to all affected jurisdictions. Specific attention should be directed toward supplementing existing monitoring protocols with sampling stations and efforts that allow the Navy to identify the contribution of Naval-generated emissions, including HAP's, long-term, and to mitigate appropriately when necessary.

The Draft EIS contains a fairly extensive write-up on the policies, plans and regulations that govern the management of hazardous materials at SSTC however, given the relatively short public review period, an adequate review of these reference materials was not possible. The Draft EIS does note that, under the Preferred Alternative, the amounts of expended training materials would increase, the weight of expended flare and smoke canister residues would increase and the amounts of residues from detonations of underwater explosives would increase. The EIS would benefit from a more specific discussion of the updated offshore petroleum discharge system (ES-9). CSP is concerned with the health of the environment for the park visitors, State Park staff, local public, and the sensitive natural resources living in this region. Review of this section would be facilitated by the inclusion of data from studies that have evaluated of levels of hazardous materials in the local environment with particular inclusion of effects on sensitive receptors. CSP feels that, with the proposed increases in expended materials, the Navy should clearly outline and commit to a testing and evaluation protocol designed to identify the degree to which hazardous materials may or may not be emitted through the SSTC operations, and the levels at which they are accumulating in the local environment. Additionally the Draft EIR states that the Navy submits EPCRA 312, Tier II forms to the emergency responders (Fed Fire) and the San Diego County Certified Unified Program Agency (CUPA), and the EPCRA 313 Toxic Release Inventory (TRI) Form R to USEPA, with courtesy copies to the California Environmental Protection Agency (Cal-EPA) and the Regional Water Quality Control Board. CSP feels that we would benefit from updated knowledge on this subject and requests that these forms be submitted to the Peace Officer Lifeguard staff stationed at Silver Strand State Beach.

The Draft EIS does not include an adequate assessment of the potential negative effects of increased activities, especially amphibious and beach activities, on spawning success of the California grunion. This species is largely endemic to Southern California and requires undisturbed natural intertidal sandy beach habitat. The Navy manages a significant portion of this species remaining suitable spawning habitat. Potential negative effects to this species should be quantified, avoided when possible, and mitigated when necessary.

Given the level of detail for specific training schedules provided in the Draft EIS, it is also difficult to assess the long-term impacts of the proposed increased activities on rare and special-status plant species occurring within the SSTC (*Cordylanthus maritimus* ssp. *maritimus, Astragalus tener* var. *titi,* and others listed in Table 3.11-2). CSP shares conservation responsibility with many of these resources and is committed to providing high quality habitat for the successful persistence of these species. CSP feels that the proposed activities in the Draft EIS have the potential to result in significant negative population-level effects for these special-status and rare plants. Suggested additional mitigation measures for rare and special-status plants found in the SSTC may include such actions as:

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1. Annual population-level surveys that quantify various impacts from increased training activity;
2. Commitment to a regional rare plant conservation program in which unavoidable impacts resulting from increased training activities are mitigated through off-site restoration and enhancement. Contribution toward a special status and rare plant conservation seed-bank should also be explored;
3. Further consideration and implementation of on-site special-status and rare plant preserves and protected conservation areas.

Section 3.11 should address the potential occurrence of Pacific pocket mouse, and the applicability of SSTC South as a viable habitat for long-term conservation of this species.

Section 3.11 should address coast horned lizard presence and conservation.

Section 3.12 should more accurately address the level to which the SSTC is critically important to the long-term sustainability of healthy migratory and shore bird populations throughout the Pacific flyway. Potential long-term negative effects from the proposed increases identified in the Draft EIS should be more accurately quantified and appropriate mitigation and avoidance measures proposed.

Section 3.13 addresses cultural resources on lands adjacent to CSP properties. CSP reviewers found the history of dredging on the strand inadequate to review mitigating measures, and as a result, questioned conclusions such as:

> As mentioned in 3.13.1.1.2, the training areas in SSTC-North are located on fill deposits that resulted from the dredging of San Diego Bay and the construction of Zuniga Jetty. These fill areas have no potential for in situ heritage resource deposits (3.13-5).

From experience on adjacent CSP properties, the dredged areas are non-contiguous, and depending upon depths, cover cultural materials that should be addressed both in the SSTC-North and SSTC–South areas. Should the SSTC-South prehistoric sites assumed to be eligible to the National Register have been on CSP land, the 'Summary of Effects' (Table ES-2) conclusion that foot traffic is not an adverse impact would have been questioned. This is especially true to the west of the highway where CSP staff have noted cultural materials in shell middens located undisturbed within centimeters of the surface.

Regarding submerged cultural sites, underwater shipwrecks and other offshore cultural materials deserve better protection than promised avoidance. As reported in the cultural resource history, Manila galleons have been passing Silver Strand since 1565. The more deeply-submerged prehistoric materials would be difficult to impact with the increased operations described, but some of the submerged historic sites will be impacted by the activities in Alternatives 1 and 2. Assurances that more specific locations and depths will be recorded with the federal clearinghouse (the South Coastal Information Center), and that Navy cultural resource managers will take an active part in designing these avoidances is requested.

Kent Randall
March 9, 2010
Page 6

The EIS considers the potential effects on traffic flow and concludes that the capacity of Highway 75 will not be significantly affected. However, CSP is also concerned about the effects that the significant increase in military operations will have as a distraction to motorists on Highway 75. The potential for creating hazardous driving conditions due to military distractions may be exacerbated during peak beach visitation periods. The EIS should analyze this aspect of its proposals potential effects on highway safety and propose appropriate mitigations.

Nearly ½ million people visit Silver Strand State Beach each year, most during the spring and summer between April 30 and September 15. The EIS fails to adequately evaluate the effect that increased military operations will have on the visual experience these beach goers have grown accustomed to. Visitors come to Silver Strand to enjoy surf-play, wide sandy beaches and eye-level views of the ocean, frames by scenic Pt. Loma (to the north) and the Coronado Islands (to the south). The EIS needs to propose means by which the negative visual effects of increased military operations can be minimized, including, but not limited to, considering the seasonality of operations.

.

California State Parks appreciates the opportunity to comment on the DEIS and hopes that our comments contribute to a better project.

Sincerely,

Clayton Phillips
Acting District Superintendent
California State Parks
San Diego Coast District
4477 Pacific Highway
San Diego, CA 92110
cphillip@parks.ca.gov

### E.2.7 California State Parks

Representing: Organization
Organization: California State Parks
Name: Clayton Phillips
Date: 3/9/2010 8:16:53PM
Subject: Other
Comment: Please see our 5 page letter which was dropped in the mail this date, March 9, 2010. Please don't hesitate to call with any questions, Clay Phillips

## E.2.8 California State Lands Commission

STATE OF CALIFORNIA ARNOLD SCHWARZENEGGER, *Governor*

**CALIFORNIA STATE LANDS COMMISSION**
100 Howe Avenue, Suite 100-South
Sacramento, CA 95825-8202

**PAUL D. THAYER,** *Executive Officer*
(916) 574-1800 FAX (916) 574-1810
*Relay Service From TDD Phone* **1-800-735-2929**
*from Voice Phone* **1-800-735-2922**

***Contact Phone:*** **(916) 574-1814**
***Contact FAX:*** **(916) 574-1885**

March 22, 2010

File Ref: Silver Strand Training Complex
Draft EIS, US Navy, San Diego County

Mr. Kent Randall
Naval Facilities Engineering Command Southwest
Code: OPME
2730 McKean St. Bldg. 291
San Diego, CA 92136-5198

**Subject: Silver Strand Training Complex Draft Environmental Impact Statement, United States Navy, North Island, San Diego County**

Dear Mr. Randall:

Staff of the California State Lands Commission (Commission) has reviewed the above referenced document and offers the following comments on the draft Environmental Impact Statement (DEIS). We understand that this project has not undergone review under the California Environmental Quality Act (CEQA). Depending on what other State or local agencies have discretionary action over the proposed project, the CSLC may take the role of a Lead Agency or a Responsible or Trustee Agency under CEQA.

As background, the State acquired sovereign ownership of tidelands and submerged lands and beds of navigable waterways upon its admission to the United States in 1850. All tidelands and submerged lands, as well as navigable rivers, sloughs, etc. are impressed with the Common Law Public Trust.

The Public Trust is a sovereign public property right, in the nature of an easement, held by the State or its delegated trustee for the benefit of all the people. This right limits the uses of these lands to waterborne commerce, navigation, fisheries, water-related recreation, habitat preservation, open space, or other recognized Public Trust purposes. A lease from the CSLC is required for any portion of a project extending onto state-owned sovereign lands, which are under its exclusive jurisdiction. As to lands involving the Public Trust Easement, the property is subject to certain land use restrictions and public rights and any inconsistent use with the easement may be prevented by the CSLC.

CSLC has issued a lease to the Navy for a portion of the beach at the Silver Strand, Lease PRC 6319.9, between the Ordinary High Water Mark of 1941 and the Ordinary High Water Mark of 1948. The Pacific Ocean waterward of the Ordinary High Water Mark of 1948 is not covered by a lease from CSLC.

Kent Randall Page 2 March 22, 2010

Based on a review of the information provided, it has been determined that the Alternative 1 (Preferred Alternative) for the proposed project will be located within state sovereign lands under the leasing jurisdiction of the Commission. The U.S. Navy will need to apply to the Commission for a lease for that portion of the beach which is not currently covered by the existing lease.

The Commission will need to make a CEQA determination prior to consideration of lease approval. Based on the information provided in the DEIS, a CEQA document will most likely need to be prepared for the proposed project in order to cover our discretionary action (lease within state sovereign lands). The CEQA document would need to include all information required under Public Resources Code, section 21000 et seq., including identifying the project's potentially significant impacts and mitigation measures to clearly avoid or mitigate those significant impacts. Public review and all appropriate noticing of the CEQA document (CEQA Guidelines, sections 15072 and 15073), as well as a Mitigation Monitoring Program, will need to be completed.

In addition to the information provided in the EIS, the CSLC would need copies of any cultural resource reports completed on land under the jurisdiction of the Commission. Any artifacts found on lands under the jurisdiction of the Commission are considered the property of the state of California. Any disposition of these artifacts requires the approval of the Commission and a transfer of title may be required.

The Commission would also like to receive copies of the following documents:

- Applicable State regulatory agency permit applications prepared for the project; and
- California Coastal Commission Consistency Determination if or when available.

If you have any questions regarding the lease application process, please contact Alan Scott at (916) 574-1861 or by e-mail at scotta@slc.ca.gov. If you have any questions regarding environmental issues, please contact Christopher Huitt at (916) 574-1938 or by e-mail at huittc@slc.ca.gov.

Sincerely,

Marina R. Brand

Marina R. Brand, Acting Chief
Division of Environmental Planning
and Management

cc: A. Scott, CSLC
C. Huitt, CSLC
M. Brand, CSLC

### E.2.9 City of Imperial Beach, California, Office of the City Manager

City of Imperial Beach, California

OFFICE OF THE CITY MANAGER

March 5, 2010

Mr. Kent Randall
Silver Strand Training Complex EIS
Naval Facilities Engineering Command, Southwest
1220 Pacific Highway, Building 1, 5th Floor
San Diego, CA 92132

Dear Mr. Randall:

The City of Imperial Beach appreciates the opportunity to review and comment on the environmental document that assesses the potential impacts of the Navy's proposal to provide increased operationally and realistic training for naval personnel at the Silver Strand Training Complex (SSTC).

The City also appreciates the national security role that the Navy provides for the country. However, the City suffers fiscally and economically in not being able to fully exploit our beach-oriented resources for our tourist industry. The City has embarked upon an aggressive redevelopment program to enhance this economic base and make overall quality-of-life improvements to the City. The City is apprehensive that increased military activities in our area might result in impacts that would work against the City's efforts to provide an attractive and quiet environment in which to live and work. We believe that we can work together in mutually achieving the City's goals and the Navy's mission to provide adequate training for our military personnel. It is in this spirit that we offer the following comments on the environmental document:

1. Due to limited staff and time, our review was not as thorough as we wished. Also given the length of the document and approximately a decade it took to prepare, we request an additional review period of 45 days.
2. The DEIS does not adequately allow a reader to assess the current and proposed activities within each lane and thus it's difficult to distinguish the impacts in the southern zones from the northern ones, and the changes from current to proposed activities.
3. With the increase in aircraft activities and firearm discharges, we request that helicopter sorties and firearm discharges stop no later than 10:00pm and start no sooner than 7:00 a.m.
4. In light of the decrease in beach access due to the increase of training activities, we suggest three mitigation steps:
   a) The Navy create an alternative pathway running from the general vicinity of the western end of Carnation Street heading in a northeasterly direction along the perimeter of the southern boundary of the base (roughly the northern boundary of IB) to the eastern boundary of the base that parallels SR-75; then proceeding northward on an existing path

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currently available to the public until the path ceases a bit south of the Cays; then proceeding in a northwesterly direction on Navy property to connect with Silver Strand State Park. This would provide walkers, joggers, runners, bicyclists a north-south pathway/trail to mitigate for the loss of beach access.

b) People also walk their dogs along the part of the beach that will be greatly affected by the increased training, and therefore we suggest that the Navy create and maintain a "dog park" somewhere along the southern perimeter of the base somewhere east of Camp Surf. (The Navy had allowed the public to use an area just east of the entry gate on Silver Strand in IB as a dog park. The area is now closed to the public, but it is a possible site to mitigate the impact of the training activities that reduce access to the beach.)

c) The Navy should assist in funding beach sand replenishment efforts. For example, the Navy could help the Corps of Engineers with dredging the entry to San Diego Bay and placing the dredge materials (sand) nearshore or on the beach along the coast of Imperial Beach. The City prefers that sand be placed onshore because this is the best way to preserve our beaches. Preserving the beach between Carnation Street and the mouth of the Tijuana River would be a measure that mitigates the reduced beach access caused by the increase of naval activities along the Silver Strand north of Carnation.

4. In light of the overall increase in noise due to helicopter activities, firearms and other training activities, mitigation activities should include:

a) Strict adherence to flight patterns at Ream Field that will not allow fixed-wing and helicopter flights over homes in Imperial Beach.

b) There should be no helicopter training at Ream Field after 9:30pm. All flights should be heading back to their home base after 9:30pm.

c) Work with the City in developing a more effective notification system of planned training activities that have the potential to impact residents of Imperial Beach (in addition to the standard notification provided to our Public Safety Department when exercises involve pyrotechnics or firearm discharges).

5. Table 3.6-9 indicates that Camp Surf is situated further away from the noise source than the residential areas of Imperial Beach when the other tables show Camp Surf closer to the noise source than the Imperial Beach residential areas. Please explain.

**Table 3.6-9: Sound from Blanks used during Immediate Action Drills**

| Sensitive Receptor | Approximate Distance (feet/m) | Sound Level (dBA) | |
|---|---|---|---|
| | | Peak | One-Hour $L_{eq}$ |
| Coronado Shores | 5,950 / 1,810 | 74 | 67 |
| Rendova Housing | 2,260 / 690 | 83 | 75 |
| Military Family Housing / Silver Strand Elementary School | 5,370 / 1,630 | 75 | 68 |
| Coronado Cays | 13,110 / 3,990 | 68 | 60 |
| Silver Strand State Beach | 10,390 / 3,160 | 70 | 62 |
| Coronado Cays | 2,560 / 778 | 80 | 72 |
| Silver Strand State Beach | 890 / 271 | 80 | 72 |
| South Bay Biological Study Area | 8,790 / 2,672 | 81 | 73 |
| YMCA Camp Surf | 16,520 / 5,022 | 77 | 69 |
| Imperial Beach Residential | 13,820 / 4,201 | 75 | 67 |

Note: Peak noise levels and $L_{eq}$'s estimated from reference sound level of 99 dBA at 350 feet and the source-receptor distances shown above, assuming distance attenuation of six decibels per doubling of source-receptor distance for a point source.

Again, we extend our appreciation for your outreach efforts to involve our community in being able to comment on this document.

Sincerely,

Gary Brown
City Manager
City of Imperial Beach

cc: file
City Council
Greg Wade, Community Development Director
Jim Nakagawa, City Planner
Jim Benson, City of Coronado

## E.2.10 City of Imperial Beach, California, Office of the City Manager

# *City of Imperial Beach, California*

*OFFICE OF THE CITY MANAGER*

March 30, 2010

Mr. Kent Randall
Silver Strand Training Complex EIS
Naval Facilities Engineering Command, Southwest
1220 Pacific Highway, Building 1, 5th Floor
San Diego, CA 92132

Dear Mr. Randall:


The City of Imperial Beach appreciates the additional time the Navy has afforded the public to review and comment on the environmental document that assesses the potential impacts of the Navy's proposal to provide increased operationally and realistic training for naval personnel at the Silver Strand Training Complex (SSTC).

The City offers the following additional comments on the environmental document:

1. The City of Imperial Beach concurs with the comment by the City of Coronado that the DEIS does not adequately address the increased environmental impacts to surrounding properties that would result with the proposed activities. While the DEIS acknowledges that the preferred plan will result in increased impacts, additional or more effective mitigation measures are not proposed to reduce the impacts preferably to a level of insignificance. The lack of mitigation measures despite the major increase in activities and impacts seems, at best,

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illogical. Mitigation measures are necessary to reduce the significant impacts resulting from the increase in quantity and types of activities proposed.

2. The City also wishes to modify our previous comment of our letter of March 5, 2010 wherein the City proposed a pedestrian and bicycle path from Carnation Avenue to Silver Strand State Park. We would like to refer to this path as a "Proposed Coastal Mitigation Trail" due to the potential loss and/or adverse impacts to the existing and long-utilized beach access along the shoreline adjacent to the Navy Radio Receiving Facility (NRRF).

3. We request that the Draft EIR carefully analyze the impacts the increased activities will have on traffic on SR 75 and Palm Avenue to Interstate 5.

Again, we extend our appreciation for being able to provide additional comments on this document.

Sincerely,

Gary Brown

Gary Brown
City Manager

cc: file
City Council
Greg Wade, Community Development Director
Jim Nakagawa, City Planner
Jim Benson, City of Coronado

## E.2.11 City of Coronado, Office of the City Council – Carrie A. Downey

**CITY OF CORONADO**
**OFFICE OF THE CITY COUNCIL**

1825 STRAND WAY
CORONADO, CA 92118

CITY HALL
(619) 522-7320

March 30, 2010

By: email submittal and follow up hard copy

Naval Facilities Engineering Command, Southwest
Attn: Mr. Kent Randall – Silver Strand Training Complex EIS
1220 Pacific Highway, Building 1, 5th floor
San Diego, CA 92132

RE: Silver Strand Training Complex Draft EIS

Dear. Mr. Randall:

Thank you for extending the draft environmental impact statement (DEIS) public comment review period. It allowed me to speak with Coronado citizens that were unable to review and understand the DEIS prior to the earlier March deadline.

I submit these comments individually as a City Councilwoman for the City of Coronado [hereinafter Coronado] in which the proposed increased training will occur. I incorporate the concerns raised in Coronado's official comments submitted by Acting City Manager James Benson on March 4, 2010 and provide additional concerns as a parent with children in the Coronado Unified School District (CUSD), as a .business owner who works in the area covered by the proposed increased training and as a resident of the City of Coronado.

The citizens of Coronado appreciate and support the training of our military forces to insure their safety and efficacy when they are sent to perform their duty in hazardous conflicts around the world. However there needs to be a balance between developing realistic training scenarios on bases and ranges that are in the midst of highly developed residential areas. I provide the following additional recommendations for traffic, noise, and public safety mitigation. These actions would increase the cooperation between Coronado residents and the Department of the Navy (DON) for status quo operations, as well as for Alternative A increased tempo operations.

1. Mitigation Measure 3.16.2.4.1 Exercise Planning. The DEIS lists the blanket statement "The Navy considers public safety in planning its exercises. Factors considered in

## Coronado City Councilwoman Carrie A. Downey SSTC EIS comments

evaluating the impact of the training on public safety include proximity of the activity to public areas; access control; schedule (time of day, day of week); public notification…."

Considering isn't the same thing as doing. DON should notify the Coronado City Manager and CUSD Superintendent of ANY change in daily operations greater that 1% over the status quo. This is different than 1% over baseline in the DEIS. As the document point out the navy is attempting to get the historical activities NEPA compliant not what is currently taking place. " The U.S. military commenced operations in Afghanistan and Iraq as part of the Global War on Terror; the deployment of units overseas caused many range complexes, including SSTC, to experience temporary decreases in usage….Thus to include additional: A). personnel movements, B) equipment or supply deliveries, C) vehicle (including boats, cars, tanks, helicopter drop offs, etc.) that could increase traffic or noise levels, and/or security procedures at the base gates. In the past all of these activities have caused significant traffic delays among Coronado residents without explanation.

Currently the Department of the Navy notifies Coronado in advance of the deployment and return date of the aircraft carriers home ported in Coronado. This allows Coronado to make operational changes in the public safety and public works departments to have the appropriate city staff on hand to try to move civilian traffic should the need arise. Likewise the City Public Works Department makes sure Coronado does not schedule sewer repair work, or CALTRANS does not schedule road repair work on days where the military bases on Coronado will be experiencing increased traffic going to and from the bases. This system has worked well for large events such as movement of aircraft carriers but it would work equally well for events that do not rise to the level of a ship's movement but would increase traffic and noise in the surrounding community such as using the beaches and or base facilities as part of a Fleet exercise or other larger training evolution.

Should the Navy need to use all 14 of the beach lanes in the Silver Strand Training Complex (SSTC) at both ends of Coronado, this would undoubtedly raise the noise levels and traffic along the Silver Strand Highway past the Coronado Cays residential development and the Silver Strand Elementary School. Both contain sensitive noise receptors, as acknowledged on page 3.6.1.4.1. The advance notification to the CUSD Superintendent would allow the option to move planned outside activities at the Silver Strand School inside or reschedule them to avoid the additional noise and or distraction it would provide the students. It would allow notification to the parents living in the Cays to expect increased traffic on the strand during school drop off time in the morning to insure school start time is not delayed.

2. Silver Strand Elementary School. Although the DEIS identify Navy Housing areas on Naval Base Coronado within the SSTC, and the location of the Silver Strand Elementary School, Table 3.6-4 Acoustic measurements during Fleetex 2002 does not provide measurements for the Silver Strand School. Please provide those measurements or an explanation that they area was not measured or is too far to receive noise from Fleetex if that is appropriate.

Noise and traffic are not the only concerns for students and parents at the Silver Strand School. The lease agreement between to CUSD and the Department of the Navy is an example of how the military and community can work together to best serve the needs of military families

2

## Coronado City Councilwoman Carrie A. Downey SSTC EIS comments

and the community. The majority of the students educated at the Silver Strand Elementary School are dependants of active duty military service members, however there is a significant portion that reside in the Coronado Cays housing development that may not have exposure to military training or military weapons. The DEIS does not explain in depth what types and frequency of training will be visible to the students attending Silver Strand Elementary School.

Under Alternative 1, the DEIS states in Section 3.16.3.3 that "SSTC land training activities would not employ live ammunition, with the exception of shotgun shells for breacher training and small arms for training inside bunkers on SSTC-S. ….Flares, smoke grenades, and other small pyrotechnics unused in training do not release projectiles or scatter fragments, and thus have no potential for effects in the absence of direct contact."

While some students would enjoy glimpses or military training, others may become frightened by the sight of Navy SEALs coming ashore with weapons. The exact nature of the visuals students and staff at the school could be exposed to should be clarified. Additionally, if there will be no live weapons of any kind used within sight of the school that needs to be clarified. The teachers and staff should be aware in advance of what might distract their students during lessons and plan accordingly. Advance notice to the CUSD Superintendant would be appropriate mitigation.

Thank you for the opportunity for extended comments by the military. The relationship between the Coronado and the military is an important part of this community. No one likes surprises, least of all those responsible for planning municipal or educational organizations. I request that the Final EIS respond to the comments filed by Coronado on March 4th and address the issues I raised above with appropriate mitigation.

Respectfully,

Carrie Anne Downey

Carrie Anne Downey
Coronado Councilwoman

## E.2.12 City of Coronado, Office of the City Manager – James F. Benson

**CITY OF CORONADO**

1825 STRAND WAY
CORONADO, CA 92118

OFFICE OF THE CITY MANAGER
(619) 522-7335
FAX (619) 522-7846

March 4, 2010

Naval Facilities Engineering Command, Southwest
Attn: Mr. Kent Randall – Silver Strand Training Complex EIS
1220 Pacific Highway, Building 1, 5th floor
San Diego, CA 92132

Re: Draft EIS for Silver Strand Training Complex

Dear Mr. Randall:

The City of Coronado has reviewed the above document and concluded that further information and analyses are required to determine the cumulative environmental impacts associated with the planned activities for the Silver Strand Training Complex (SSTC). Of particular concern are the statements contained throughout the document that the military facilities and/or operations are not expanding; rather, just the frequency; therefore, no environmental mitigation is required.

The draft EIS contains several areas where it acknowledges new operations and new activities will be occurring at SSTC. If more military operations and activities will be occurring at SSTC, then more personnel will be arriving in Coronado, and more vehicles will be commuting to and through Coronado impacting local streets. Not only will the additional traffic lead to impacts to intersections currently at unacceptable Levels of Service, but the overall preferred plan of continued plus new activities and operations will lead to significant cumulative impacts on traffic, noise, greenhouse gas emissions, and the public's access to utilize the waters of the State, which, when considered together, should be mitigated.

Please revise the draft EIS to address the questions and concerns described on the attachment.

Of note is that the draft EIS does not appear to adequately address the expanded activities of the Preferred Alternative and associated traffic, noise, and coastal access impacts to surrounding properties within SSTC corridor, both individually and cumulatively. The draft EIS acknowledges increased noise impacts, durations, and sound levels; however, no mitigation is proposed based upon the assumption that activities currently exist and there will be an expansion over a broader area that will minimize noise impacts. The draft EIS needs to be revised to properly address, analyze, and quantify the items detailed in the list attached to this letter.

SSTC EIS
Page 2

Lastly, it was pointed out to the Coronado City Council at their meeting of March 2, 2010, that the citizens of Coronado have not had adequate time to review this document. Given the fact that the plan has been understudy since 2001, it would seem appropriate to provide the public with more than 45 days to review such a voluminous document. The City requests an extended public review and comment period for the EIS.

Thank you in advance for reviewing and responding to our questions and requests for further information so the City can adequately determine the scope of anticipated environmental impacts to the Silver Strand corridor associated with the Navy's Silver Strand Training Complex. The City also appreciates your serious consideration of an extended period of time to review the document to allow for full public participation and review of this important study.

Sincerely,

James F. Benson
Interim City Manager

JFB/mlc

Attachment: List of issues to be addressed in the draft EIS

cc: Mayor and Councilmembers
Tom Ritter, Assistant City Manager
Rachel Hurst, Director of Community Development
Ed Walton, Director of Engineering
Scott Huth, Director of Public Services
Ann McCaull, Senior Planner

ATTACHMENT

## LIST OF ISSUES TO BE ADDRESSED IN THE DRAFT EIS

1. The draft EIS acknowledges there will be new squadrons, flight patterns and helicopter training occurring at SSTC. The draft EIS fails to identify the location points where the helicopters will take off and the paths of travel to and from the training areas and any increased public safety risks to residents, school populations, and beach users due to the increased amount of flight activity as well as the increased frequency and noise associated with the increased frequency of activity. The draft EIS should address, quantify, and analyze these issues.

2. Section 3.1-12 notes that 80% of flight occurs over the water and aircraft are required to approach and depart from training activities over the water. Is there a map that shows this flight pattern? What is the flight pattern for the remaining 20% including both approach and departure locations? The draft EIS should address, quantify, and analyze these issues.

3. Section 3.1.2.3.1 notes a new activity, N8 Tactical Recovery of Aircraft and Personnel, would involve landing or hovering of helicopters at SSTC-S at nighttime. Where exactly within the southern area of the training complex would this activity occur? How many aircraft, how frequent and for what duration would this occur?

4. Section 3.6-26 discusses Acoustic Impacts associated with the Preferred Alternative. The draft EIS notes sound levels will remain the same but training events producing sound would increase in frequency. No mitigation is proposed. The draft EIS needs to analyze the noise impacts of the increased number of training events both individually and cumulatively.

5. Section 3.6.2.3.2 notes existing aircraft noise is increasing from 778 helicopter sorties per year to 2,220 per year representing a 185% increase. What is the duration and frequency of the sorties? The Amphibious Raid activity is noted to represent the most intense aircraft sound event at SSTC and the frequency of the events would increase to 18 per year. What is the duration of these events? It is not clear from the tables and maps where these activities would be located. An additional activity noted as Tactical Recovery of Aircraft and Personnel (TRAP) notes 5 helicopters could be employed and the activity would occur at night, lasting one to two hours. It does not appear to be identified in Table 2-2 and it is not clear where this activity would occur. Cumulatively, the analyses conclude the types of activities described have occurred over time and the only difference is the frequency and no mitigation is required. If the number of activities, duration of activities, and type of activities increases, the amount of noise will unquestionably increase representing significant changes in noise levels to the area and should be mitigated.

6. How do the planned flight paths for new helicopters (to and from SSTC) align with the current Airport Land Use Study for the military bases? How will these planned/proposed paths affect a study that is currently underway for the NAB and those existing uses within the project boundary?

7. The draft EIS does not identify the flight path and accident potential zones (APZs) areas for the helicopters and aircraft in transit to SSTC. The document references NAVFAC P-80.3 indicating APZ is not required. Provide documentation from the referenced document justify/explaining why none is required.

8. The Acoustic Environmental analysis notes there will be an increase in the frequency of aircraft; increase in amphibious vehicle training; increase with ELCAs and associated pile driving; increase in Breacher activities and use of shotgun blasts. The draft EIS notes while all of these activities will be generating increased noise levels, only the frequency of activity will be increasing; therefore, no mitigation is proposed. Mitigation is identified as the Navy's ongoing process and procedures to notify adjoining agencies/facilities when disturbances will occur. Public notification that noise impacts will occur does not mitigate the noise impacts experienced by students and school officials, residents and tourists.

9. Section 2.3, page 2-27 discusses Alternative 1 as the Navy's Preferred Alternative and is "designed to meet Navy and Department of Defense (DOD) current and near-term operational training requirements." How is "near-term" operational training requirements defined? Is there an estimate for how long these expanded activities, increased training tempos and operations will meet the 100% training needs as identified in the draft EIS? Is this for a period of 5 years, 10 years or longer? If some of the "new" activities and training operations need to be expanded in the future to meet Navy mission requirements, will a supplemental Environmental Assessment be completed?

10. The Purpose and Need section discusses "increased training tempo" from current baseline conditions. This needs to be better defined to be properly analyzed. For example, the baseline tempo of 3,926 activities indicates it is not associated with personnel. The Preferred Alternative indicates an increase in activities approximately 41% to 5,543 activities but there are no associated man hours to correspond to these activities. The draft EIS should be revised to address/clarify increased training tempo of approximately 41% without increased personnel.

11. Section ES 1.3.1 documents the increase of Naval Special Warfare personnel operating on NAB Coronado, equivalent to one additional Sea, Air and Land team. It also documents the realignment of the Explosive Ordnance Disposal groups, which has necessitated expanded use of the Southwest Region training venue, including SSTC. The Marine Corps will also increase the number of personnel cycling through training programs at SSTC. Finally, it discusses new platform, training equipment, and service life extension programs to keep up with current needs. All of the needs correspond to additional personnel training at SSTC but they are not quantified nor are their impacts on the community accounted for in the draft EIS. In particular, what are the impacts to daily traffic as these new personnel travel to and from NBC to participate in this training?

12. The Traffic and Circulation section notes there will be an increase in trips resulting from increased activities and operations; however, it will be less than 2% of the total daily traffic generated. The draft EIS acknowledges Gates 1 & 2 currently experience unacceptable Level of Service. The draft EIS notes that since the increased activity will amount to 2% of traffic, no mitigation is proposed. Any further decrease to the level of service to these intersections should be analyzed and addressed.

13. Section 4.3.14, Page 4-22 Transportation and Circulation cumulative analysis does not adequately analyze the impacts associated with the "increased tempo" of activities proposed with SSTC Preferred Alternative. Where are the estimated traffic generation rates to arrive at the conclusion of a less than 2% increase in traffic? How can an argument be made that since the number of employed are not increasing, therefore, there will be no increase in traffic? What about the new and expanded activities and training planned for SSTC? Where are these "employees" coming from when some of the activities are "new" to SSTC? The document should analyze all the trips associated with the increased training activities including commuter access to/from SSTC/NBC.

14. Table 2.1, Baseline and Proposed Tempos for SSTC Training Activities, identifies 78 training activities along with duration and number of events per year. The document should relate the activities to number of personnel. How many people are training under the baseline and how many will be training under the proposed activities?

15. Table 2-2, Proposed New Training Activities at SSTC for Alternatives 1 and 2, identifies 11 new activities. The document should relate the new activities to the number of personnel. How many additional people will be trained under the new activities compared to the baseline?

16. The draft EIS notes baseline activities will increase from 3,926 activities to 5,343. Many of the new activities are a result of new helicopter training activities such as 200 new mine hunting; 48 new helicopter mine detection; 100 helicopter activity; 48 MH-60s helicopters; 124-154 helicopter rope training; and 109 to 198 Close Quarter Combat with helicopter use. Amphibious Raise (with possible helicopter use) will expand from 6 days a year to 54 activities a year. Perhaps even more significantly, CRRC OTB Insertions and Pyrotechnics will increase from 4 day events approximately 52 times a year to 86 times a year. This change results in almost 365 days per year this activity will occur. The draft EIS does not analyze the cumulative impact of the entire new helicopter activities will have on the air when cumulatively combined. The draft EIS does not contain a section where analysis of combined activities along SSTC can be visualized and analyzed in terms of cumulative activities and noise.

17. Section 3.3.2.1.1, Emissions Evaluation Methodology, discusses emissions from ground vehicles only and should include vehicles involved in the training activities. It should also include all additional vehicles trips to get the personnel to the training (commuter trips).

18. Transportation and Circulation, Page 3.14-4 last paragraph states: The Rendova Road (Gate 1) and Tarawa Road (Gate 2) intersections operate at LOS E during the busiest morning commute hours and Tarawa again operates at LOS E during the busiest afternoon commute hour. This conflicts with Table 3.14-3 which has a LOS F for Tarawa in both a.m. and p.m. peak hours.

19. Transportation and Circulation Page 3.14-5, second paragraph states: The City of Coronado is currently in the process of analyzing traffic conditions for SR-75 to determine the best long-term traffic solutions for the community. This project is actually the SR 75/282 Transportation Corridor Project which is analyzing traffic conditions along the corridor between the bridge and NASNI, not SR-75 adjacent to SSTC.

20. Section 3.14.2.3.1 Ground Transportation indicates under Alternative 1, military training activities are estimated to generate approximately 336 ADTs. The draft EIS should analyze all trips generated from the increased activities and increased training tempo.

21. 3.14-5 Summary of Effects section: Silver Strand at Rendova Road and Silver Strand at Tarawa are signalized intersections with LOS E or worse. All additional traffic generated by the increased activity should be analyzed and the amount of delay calculated in accordance with the SANTEC/ITE Guidelines for the San Diego Region. In addition, there is no mention of the number of pedestrian crossings between the bay side and ocean side of NAB, which affects the signal capacity and causes delay. The document should quantify the number of pedestrian trips across SR-75 that occur and how many more would be expected under Alternatives 1 and 2.

22. 5.13 Transportation and Circulation section does not propose or identify mitigation for the increased transportation and circulation in the proposed alternatives.

23. List of Preparers: A Traffic Engineer was not identified under the list of preparers. Who analyzed the Transportation and Circulation sections?

24. The draft EIS does not identify the potential impacts to the intersections due to increased foot and boat traffic from bay side to beach side. Do the increased activities warrant re-evaluation of an underpass or overpass?

25. Section 5-5 refers to mitigation for underwater detonations and security precautions. When planned activities are underway, will areas of the public beach/water be cordoned off?

26. Section 5-19 notes there is an interpretive sign planned for the bike trail near south Delta Beach. This sign would be located in the Scenic Highway Corridor zone and should be designed to be consistent with the overall Silver Strand Enhancement plan.

27. Table 4-1, Page 4-2 notes future planned improvements for the Navy Lodge. It notes four existing buildings and several smaller structures will be demolished and will be replaced with a lodge building to increase room capacity as well as new recreational facilities, parking, retail shops and a restaurant. What is the approximate square footage of this new facility and net increase in units? Are these additional lodge units to be temporary "resort" type facilities or housing for living purposes as a BOQ or BEQ? Are these additional housing units being proposed to accommodate expanded military operations such as the two new commands at NASNI? The draft EIS further notes in this section that along with the commands, there will be construction of a pier, boat ramp, and several buildings. Where is this project being located and could it also serve as a potential pier/boat ramp to re-instate the ferry service to NASNI that was recently discontinued?

28. Table 4-1, Page 4-3 briefly discusses the U.S. Navy Lighterage project, which involves construction of a waterfront command and control facility for amphibious construction Battalion One facilities to support the introduction of the improved Navy Lighterage System at NBC. The draft EIS does not describe this new system at NBC and should describe the activities associated with the system.

29. Section 4.3.16, Page 4-23 Public Health and Safety cumulative analysis notes there will be momentary disruptions in communication to nearby residences and schools. The draft EIS does not identify how frequently and for what duration. The draft EIS identifies impacts associated with the expanded activities planned for SSTC individually; however, it fails to cumulatively analyze the activities combined to determine the length and period of all activities combined on the residential and school areas. For example, it appears there will be full time operation of the beach lanes at SSTC almost every day throughout the year. Where have those activities – length, time, duration – been analyzed?

30. Table 3-1- states Coronado Beach is the only public beach in Coronado. This statement is incorrect. The Silver Strand State Beach is also located within the City of Coronado.

31. Section 3.6.2.3.3 indicates current Breacher Training operations are 14/day when an event occurs and an event occurs 20 times per year. The draft EIS notes operations will increase to 1,400 annually. How does the increase in activity affect the number of events per year and number per day so an assessment can be made regarding the degree of change on a daily, weekly, or monthly basis?

32. Section 3.6.2.3.4 describes Amphibious Training operations increasing landings from 10,000 to 13,800 per year and LCAC activities (generating the most noise) will increase from 8 to 40 per year. The draft EIS identifies LCAC landings along with associated pile driving that occurs for at least 1 to 2 hours generating decibel levels of 74 to 104, 100' away. The draft EIS notes this activity has the potential to generate the largest number of increased complaints regarding noise and activity levels, particularly due to the proximity of the activity to Silver Strand housing and Silver Strand School. The draft EIS does not propose any mitigation, however, notes the training could result in sleep and communication disturbances. If the draft EIS acknowledges impacts, why aren't mitigation measures proposed? To state the Navy will advise surrounding agencies when potential impacts may occur is simply public notification and does not mitigate the related noise impacts. For example, could changes be made to the school to improve sound attenuation?

33. The draft EIS does not identify the entire Silver Strand as a State Scenic Highway and the Silver Strand (bay to ocean) as a Scenic Highway Overlay zone. The draft EIS should address the potential visual and environmental impacts associated with any new large equipment or improvements that would be visible along the Silver Strand. The City and Navy have worked cooperatively in the past to eliminate unnecessary signs, dilapidated training equipment, and vertical obstructions along the Silver Strand to improve the overall aesthetic improvement to the Silver Strand and assist with Least Tern and Snowy Plover preservation efforts.

34. The draft EIS proposes to institute beach sand berming activities, which negatively impacts the scenic highway and the public use of view corridors. For example, the berming of sand on SSTC has directly impacted the public in the past by blocking sunlight to the Solstice Clock feature in Natures Bridge (Silver Strand's Bayside Nature Trail). In December 2009, at the request of a group of citizens that meet for the winter solstice at this site, the City requested the Navy to lower the berm on December 21 so the sunlight could shine through to the Solstice Clock. The Navy was unable to accommodate this request but did not preclude this request from being accommodated in the future. The draft EIS should address how berming activities will be minimized to avoid the conflicts described in this example as well as other potential berming conflicts along the Strand. This could be addressed through an action plan that identifies how

City and Navy communication will be coordinated and improved to ensure present and future berming activities along the Strand do not negatively impact the Scenic Highway.

35. Several years ago, the Navy bermed up areas on the ocean side of NAB. This activity affected beach sand deposits in front of the Coronado Shores. It has also appeared to accelerate beach erosion at the south end of the Shores. The draft EIS does not address sand movement for training operations and impacts.

36. Figure ES-1 shows anchorage areas directly offshore of Coronado's Central Beach area, which are a direct encroachment into the public's view corridor. There are ample anchorage areas adjacent to Federal (US Navy) property; therefore, there is no necessity for anchorage areas for military craft as shown.

37. Section 3.5.243 of the draft EIS indicates that, if all increased training activities were performed individually, there would be an 85% increase in the amount of time that portions of the bay and/or ocean would be closed to public use. The report also points out that if activities occur simultaneously, that percentage would decrease. Even with that, it is not clear how the public interest is served by this monopolization of ocean and bay use by the military. This proposed increase would have a definite negative impact on public use of these natural resources.

38. The City's beaches are already impacted by trash and other debris from a variety of sources. The draft EIS does not provide for any programs to mitigate the effects of the expanded programs adding to this trash and debris. The City is not aware of any current, ongoing program to clean the Navy's beach areas. The Navy's trash and debris, as well as that from other sources, accumulates on Navy property; tidal action and currents then deposit this trash and debris on public beaches. Expanded training activities will not only disturb buried trash and debris, releasing it into the environment; expanded water-based activities will re-suspend particulate debris deposited on the ocean bed. In summary, expanded training activities will likely lead to an increase in the amount of trash and other debris accumulating on Coronado's beaches in the area. The draft EIS should be revised to address these issues and mitigation.

39. The draft EIS refers to OPNAVINST 5090.1 in several locations; however, this document was not provided as an attachment. Some sections of the report indicate that the discharge of bilge water and grey water is not allowed; other sections of the report seem to indicate that this discharge is allowed under certain conditions. Discharge of grey water and/or bilge water from any Navy vessel in the training area should be prohibited for any reason.

40. The draft EIS describes training activities, which would include the creation of salt water ponds for temperature training. This ponded water would experience human contact for extended periods of time. Any ponded water used for this type of training should be tested to ensure that it meets established water quality standards prior to release back to the ocean and/or bay. The draft EIS should be revised to address this issue.

41. The draft EIS should further discuss, explain and analyze the permit for reverse osmosis water purification and unit discharge into the Bay and Ocean as discussed in Chapter 6 of the draft EIS.

42. In the course of describing training activities, the draft EIS indicated that some running exercises would be performed with military working dogs traversing beach areas. Dogs are prohibited on the City's beaches, except for the area designated as Dog Beach, located at the northwest end of the City's Central Beach, near the Air Station's Ocean Boulevard gate.

I:\GENERAL\Letters&Memos\From the CM\Silver Strand Comments SSTC EIS 0210.doc

### E.2.13 Department of the Interior

Representing: Organization

Organization: Department of the Interior

Name: Patricia Port

Date: 3/10/2010 12:58:03PM

Subject: Other

Comment: Please disregard the Department of the Interior's no comment letter sent electronically through this website on Monday, March 8, 2010. Please consider comments from the U.S. Fish and Wildlife Service, which will be sent in hard copy format to the suggested address.

## E.2.14 Department of Transportation

STATE OF CALIFORNIA—BUSINESS, TRANSPORTATION AND HOUSING AGENCY ARNOLD SCHWARZENEGGER, Governor

**DEPARTMENT OF TRANSPORTATION**
DISTRICT 11
4050 Taylor St., MS 240
SAN DIEGO, CA 92110
PHONE (619) 688-6960
FAX (619) 688-4299
TTY 1-800-735-2929

*Flex your power!*
*Be energy efficient!*

March 9, 2010

11-SD-75
PM Var

Mr. Kent Randall
Naval Facilities Engineering Command, Southwest
Silver Strand Training Complex
1220 Pacific Highway, Building 1, 5th Floor
San Diego, CA 92132

RE: Silver Strand Training Complex Project - DEIS

Dear Mr. Randall:

The California Department of Transportation (Caltrans) appreciates the opportunity to have reviewed the Draft Environmental Impact Statement (DEIS) for the Silver Strand Training Complex Project located along State Route 75 (SR-75) south of the City of Coronado. Caltrans has the following comments:

The AM peak Intersection Volumes at Rendova Road is 3,328 with level of service (LOS) E. The AM peak and PM peak Intersection Volumes at Tarawa Road are 3,284 and 3,406 with LOS F. These two intersections LOS are exceeding Caltrans threshold to maintain a target LOS between "C" and "D". Any trips added to an intersection already operating at LOS F typically reduces the intersection measure of effectiveness (MOE operating capacity). A corridor segment or intersection currently operating at LOS F has reached its maximum effective operating capacity. Any additional trips added without maintaining the existing MOE's would further degrade the operational function and does not allow an intersection or segment to continue to operate within its capacity, as the segment or intersection has failed. Significant delays are expected at an intersection or roadway segment operating at LOS F. This should be documented as such in the EIS. The above intersections should also be analyzed for Existing plus Project to specify the significance of traffic generated by Marine activities additional trips.

On page 3.14-4 to 3.14-5, the Rendova Road intersection operates at LOS E during the AM peak hour; and Tarawa Road intersection operates at LOS F for both AM peak and PM peak hour. Please revise.

On page3.14-5, section 3.14.1.4.2 Traffic volumes along Palm Avenue between 2005 and 2006 have decreased by 39%. The same applies for Table 3.14-4. Please revise.

*"Caltrans improves mobility across California"*

Mr. Kent Randall
March 9, 2010
Page 2

The Traffic Impact Analysis (TIA) within the EIS did not address potential increase (or decrease) in pedestrian related trips at the analyzed intersections. The TIA should address the potential impacts that may occur as a result of any increase in pedestrian trips from Oceanside training to bayside training etc. Increased pedestrian trips can have a substantial impact on intersection operations, as the existing pedestrian crossing time may not be adequate to handle additional trips and may require the pedestrian crossing phase time to be increased to meet the added demand, thus lowering the overall capacity of intersections where this may occur. This would be especially important to know for the peak periods analyzed within the TIA.

Any reduction in pedestrian trips during the peak periods that may increase the capacity of any of the signalized intersections analyzed, such as new eating facilities on the beach side training facility, which would reduce the need for trips at the analyzed intersections would be helpful to note as well.

Based on the inclusion of these revisions to the EIS, Caltrans has no further comments.

If you have any questions or require further information, please contact Christian Bushong at (619) 688-2510 or Christian.Bushong@dot.ca.gov.

Sincerely,

JACOB M. ARMSTRONG, Chief
Development Review Branch

*"Caltrans improves mobility across California"*

## E.2.15 United States Environmental Protection Agency, Region IX

**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY**
**REGION IX**
**75 Hawthorne Street**
**San Francisco, CA 94105**

3/09/2010

Mr. Kent Randall
Naval Facilities Engineering Command, Southwest
Code OPME
2730 McKean St. Bldg. 291
San Diego, CA 92136-5198

Subject: Silver Strand Training Complex, Draft Environmental Impact
San Diego, CA (CEQ # 20100016)

Dear Mr. Randall:

The U.S. Environmental Protection Agency (EPA) has reviewed the subject document pursuant to the National Environmental Policy Act (NEPA), Council on Environmental Quality (CEQ) regulations (40 CFR Parts 1500-1508), and our NEPA review authority under Section 309 of the Clean Air Act.

EPA acknowledges the importance of military training, and the challenge of balancing training programs with environmental requirements. EPA compliments the Navy on its role in aiding the recovery of the least terns.

We have rated the Draft Environmental Impact Statement (DEIS) as Environmental Concerns – Insufficient Information (EC-2) (see enclosed "*Summary of Rating Definitions*"). We are concerned about the project's impacts on water resources and biological resources, and about the need for waste minimization. We also request clarification of the baseline training tempo. Additional information about our concerns is provided in the enclosed detailed comments.

We appreciate the opportunity to review this DEIS. When the FEIS is released for public review, please send one (1) hard copy to the address above (mail code: CED-2). If you have any questions, please contact me at (415) 972-3521, or contact Tom Kelly, the lead reviewer for this project. Tom can be reached at (415) 972-3852 or kelly.thomasp@epa.gov.

Sincerely,

Tom Kelly

for Kathleen M. Goforth, Manager
Environmental Review Office
Communities and Ecosystems Division

Enclosed: EPA Detailed Comments
EPA Ratings Summary

cc: Sandy Vissman, U.S. Fish and Wildlife Service

**EPA DETAILED COMMENTS ON THE DRAFT ENVIRONMENTAL IMPACT STATEMENT (DEIS) FOR SILVER STRAND TRAINING COMPLEX, SAN DEIGO COUNTY,CA, MARCH 2010**

**Water Resources**

*Vernal Pools*

As stated in EPA's website[1], "[m]ore than 90% of California's vernal pools have already been lost. Great efforts are being made to protect the remaining vernal pools, as their disappearance marks the loss of rare and important habitat and some of the associated plant and animal species as well." At the Silver Strand Training Complex – South (SSTC-S), the vernal pools cover 3.2 acres in total (Table 3.11-1). Additionally, many contain endangered San Diego fairy shrimp "found in 11 of 25 vernal pools and salt marshes surveyed" (page 3.11-12).

In the preferred alternative, the DEIS states on page ES-10, "[t]he Navy would allow limited training involving foot traffic, but not vehicle traffic, in the vernal pools when vernal pool conditions are determined to be dry." The DEIS also states in Table 3.11-4, "[d]ry conditions would be determined by a qualified person overseen by a NBC [Naval Base Coronado] Botanist or Wildlife Biologist." While foot traffic in the vernal pools when the soil is dry and hard is unlikely to damage fairy shrimp, determining when the pools are dry enough for foot traffic is complex.

**Recommendation:**
EPA recommends the Navy work with U.S. Fish and Wildlife Service to identify the highest quality vernal pools, and fence those to minimize impacts from training.

Alternatively, EPA suggests

- the FEIS commit to an inspection of vernal pools by a wildlife biologist, prior to upland training at beach Purple 2, or
- the FEIS list the factors that will be used to determine the vernal pools are dry enough to withstand foot traffic.

*Sediment Quality*

The DEIS states on page 3.5-14, "[r]ecent sediment sampling in the San Diego Bay near SSTC-N indicates – while concentrations of some contaminants are elevated above background levels – no contaminants were present at concentrations which would adversely affect marine organisms (Port of San Diego 2002)." EPA encourages a fuller discussion of sediment sampling results near SSTC-N and any screening levels used to

[1] http://www.cpa.gov/wetlands/types/vernal.html

1

determine that no contaminants were present at concentrations of concern. The purpose of the sediment sampling in the report cited (San Diego Harbor Deepening EIS/EIR, USACOE, November 25, 2002) most likely was intended to characterize the quality of the sediment to be dredged, and may not have specifically addressed the sediment at SSTC-N. Even more so than dredging, underwater explosions are likely to make contaminated sediments bioavailable to fish and marine mammals.

**Recommendation:**
The FEIS should provide additional discussions of sediment sampling at SSTC-N, including a brief description of the number of samples, depth of sampling and contaminant concentrations.

**Biological Resources**

*Least Terns*

The DEIS discusses physical training for groups averaging 30 – 150 people (Table 2-1, page 2-24), and includes that "trainees may occasionally have a military working dog participate in the physical conditioning." Page 3.11-39 also clarifies that military working dogs "are typically on the hard packed sand (SSTC-S) or sand road (SSTC-N), they can also be on the soft packed sand in both areas." While federal endangered least terns may have acclimated to the presence of humans nearby, barking dogs in nesting areas does not seem prudent, particularly when exercise in the nearby hard packed sand would be much less intrusive.

**Recommendation:**
The FEIS should include a mitigation measure that avoids conditioning military working dogs in least tern nesting areas (i.e. the soft packed sand of Blue 2, Orange 1 and Orange 2).

**Waste Minimization**

EPA recognizes the Naval Region Southwest's commitment to sustainability, including renewable energy, water conservation, green buildings and more. We commend the Navy for "pumping seawater through its Offshore Petroleum Discharge System during training, instead of using petroleum products." In comparison, the DEIS does not explain whether a high level of scrutiny has been applied to the explosive training exercises, although it does identify potential munitions constituents of concern and explosives residue (on page 3.4-10 and 11). EPA acknowledges that in many instances the success of training exercise may not be judged without using the actual amount of explosive also used in field conditions, however, that may not be the case for all explosives training exercises.

**Recommendation:**
The FEIS should assess the potential to reduce explosive charges in meeting its training needs.

**Clarification of Baseline Training Tempo**

Various sections of the DEIS provide information on baseline training tempo, including Table 2-1. EPA encourages a more thorough discussion of the development of the baseline training tempo, to clarify the concept. The FEIS should, for example, explain whether the values in Table 2-1 represent the amount of training conducted in a specific year or the amount of training that could be conducted given the current restrictions on training. Where the baseline training tempo is not reflective of recent training activities, EPA suggests the FEIS include a comparison with recent training activities. This will foster better understanding of the FEIS. EPA is not suggesting additional factors need to be used for comparison throughout the FEIS, only that it should link training tempo to recent levels of training at SSTC.

3

# SUMMARY OF EPA RATING DEFINITIONS*

This rating system was developed as a means to summarize the U.S. Environmental Protection Agency's (EPA) level of concern with a proposed action. The ratings are a combination of alphabetical categories for evaluation of the environmental impacts of the proposal and numerical categories for evaluation of the adequacy of the Environmental Impact Statement (EIS).

## ENVIRONMENTAL IMPACT OF THE ACTION

***"LO" (Lack of Objections)***

The EPA review has not identified any potential environmental impacts requiring substantive changes to the proposal. The review may have disclosed opportunities for application of mitigation measures that could be accomplished with no more than minor changes to the proposal.

***"EC" (Environmental Concerns)***

The EPA review has identified environmental impacts that should be avoided in order to fully protect the environment. Corrective measures may require changes to the preferred alternative or application of mitigation measures that can reduce the environmental impact. EPA would like to work with the lead agency to reduce these impacts.

***"EO" (Environmental Objections)***

The EPA review has identified significant environmental impacts that should be avoided in order to provide adequate protection for the environment. Corrective measures may require substantial changes to the preferred alternative or consideration of some other project alternative (including the no action alternative or a new alternative). EPA intends to work with the lead agency to reduce these impacts.

***"EU" (Environmentally Unsatisfactory)***

The EPA review has identified adverse environmental impacts that are of sufficient magnitude that they are unsatisfactory from the standpoint of public health or welfare or environmental quality. EPA intends to work with the lead agency to reduce these impacts. If the potentially unsatisfactory impacts are not corrected at the final EIS stage, this proposal will be recommended for referral to the Council on Environmental Quality (CEQ).

## ADEQUACY OF THE IMPACT STATEMENT

***"Category 1" (Adequate)***

EPA believes the draft EIS adequately sets forth the environmental impact(s) of the preferred alternative and those of the alternatives reasonably available to the project or action. No further analysis or data collection is necessary, but the reviewer may suggest the addition of clarifying language or information.

***"Category 2" (Insufficient Information)***

The draft EIS does not contain sufficient information for EPA to fully assess environmental impacts that should be avoided in order to fully protect the environment, or the EPA reviewer has identified new reasonably available alternatives that are within the spectrum of alternatives analysed in the draft EIS, which could reduce the environmental impacts of the action. The identified additional information, data, analyses, or discussion should be included in the final EIS.

***"Category 3" (Inadequate)***

EPA does not believe that the draft EIS adequately assesses potentially significant environmental impacts of the action, or the EPA reviewer has identified new, reasonably available alternatives that are outside of the spectrum of alternatives analysed in the draft EIS, which should be analysed in order to reduce the potentially significant environmental impacts. EPA believes that the identified additional information, data, analyses, or discussions are of such a magnitude that they should have full public review at a draft stage. EPA does not believe that the draft EIS is adequate for the purposes of the NEPA and/or Section 309 review, and thus should be formally revised and made available for public comment in a supplemental or revised draft EIS. On the basis of the potential significant impacts involved, this proposal could be a candidate for referral to the CEQ.

*From EPA Manual 1640, Policy and Procedures for the Review of Federal Actions Impacting the Environment.

## E.2.16 Federal Emergency Management Agency, Region IX

**U.S. Department of Homeland Security**
FEMA Region IX
1111 Broadway, Suite 1200
Oakland, CA. 94607-4052

FEMA

March 8, 2010

Kent Randall – Silver Strand Training Complex EIS
Naval Facilities Engineering Command, Southwest
1220 Pacific Highway, Building 1, 5th Floor
San Diego, California 92132

Dear Mr. Randall:

This is in response to your request for comments on the Silver Strand Training Complex Environmental Impact Statement in the County of San Diego, Cities of Coronado and Imperial Beach, California.

Please review the current effective countywide Flood Insurance Rate Maps (FIRMs) for the County of San Diego (Community Number 060284), and Cities of Coronado (Community Number 060287) and Imperial Beach (Community Number 060291), Maps revised September 29, 2006. Please note that the Cities of Coronado and Imperial Beach, San Diego County, California are participants in the National Flood Insurance Program (NFIP). The minimum, basic NFIP floodplain management building requirements are described in Vol. 44 Code of Federal Regulations (44 CFR), Sections 59 through 65.

A summary of these NFIP floodplain management building requirements are as follows:

- All buildings constructed within a riverine floodplain, (i.e., Flood Zones A, AO, AH, AE, and A1 through A30 as delineated on the FIRM), must be elevated so that the lowest floor is at or above the Base Flood Elevation level in accordance with the effective Flood Insurance Rate Map.

- If the area of construction is located within a Regulatory Floodway as delineated on the FIRM, any ***development*** must not increase base flood elevation levels. **The term *development* means any man-made change to improved or unimproved real estate, including but not limited to buildings, other structures, mining, dredging, filling, grading, paving, excavation or drilling operations, and storage of equipment or materials.** A hydrologic and hydraulic analysis must be performed *prior* to the start of development, and must demonstrate that the development would not cause any rise in base flood levels. No rise is permitted within regulatory floodways.

www.fema.gov

Kent Randall
Page 2
March 8, 2010

- All buildings constructed within a coastal high hazard area, (any of the "V" Flood Zones as delineated on the FIRM), must be elevated on pilings and columns, so that the lowest horizontal structural member, (excluding the pilings and columns), is elevated to or above the base flood elevation level. In addition, the posts and pilings foundation and the structure attached thereto, is anchored to resist flotation, collapse and lateral movement due to the effects of wind and water loads acting simultaneously on all building components.

- Upon completion of any development that changes existing Special Flood Hazard Areas, the NFIP directs all participating communities to submit the appropriate hydrologic and hydraulic data to FEMA for a FIRM revision. In accordance with 44 CFR, Section 65.3, as soon as practicable, but not later than six months after such data becomes available, a community shall notify FEMA of the changes by submitting technical data for a flood map revision. To obtain copies of FEMA's Flood Map Revision Application Packages, please refer to the FEMA website at http://www.fema.gov/business/nfip/forms.shtm.

**Please Note:**

Many NFIP participating communities have adopted floodplain management building requirements which are more restrictive than the minimum federal standards described in 44 CFR. Please contact the local community's floodplain manager for more information on local floodplain management building requirements. The Coronado floodplain manager can be reached by calling Gary Fausett, Senior Building Inspector, at (619) 522-7326. The Imperial Beach floodplain manager can be reached by calling Edward Wilczak, Building Official, at (619) 628-1357. The San Diego County floodplain manager can be reached by calling Cid Tesoro, Flood Control District Manager, at (858) 694-3672.

If you have any questions or concerns, please do not hesitate to call Michael Hornick of the Mitigation staff at (510) 627-7260.

Sincerely,

Gregor Blackburn, CFM, Branch Chief
Floodplain Management and Insurance Branch

cc:
Gary Fausett, Senior Building Inspector, City of Coronado
Edward Wilczak, Building Official, City of Imperial Beach
Cid Tesoro, Flood Control District Manager, San Diego County
Garret Tam Sing/Salomon Miranda, State of California, Department of Water Resources, Southern Region Office
Michael Hornick, Floodplanner, CFM, DHS/FEMA Region IX
Alessandro Amaglio, Environmental Officer, DHS/FEMA Region IX

www.fema.gov

## E.2.17 San Diego County Archaeological Society, Inc.

**San Diego County Archaeological Society, Inc.**

Environmental Review Committee

4 March 2010

To: Mr. Kent Randall
Naval Facilities Engineering Command, Southwest
Building 1, 5th Floor
1220 Pacific Highway
San Diego, California 92132

Subject: Draft Environmental Impact Statement
Silver Strand Training Complex

Dear Mr. Randall:

I have reviewed the cultural resources aspects of the subject DEIS on behalf of this committee of the San Diego County Archaeological Society.

Based on the information contained in the DEIS, while we appreciate the actions the Navy has taken to protect cultural resources in the Silver Strand Training Complex, we have the following comments:

1. The DEIS describes actions the Navy routinely takes to avoid significant impacts to cultural resources, such as notification of restrictions prior to activities. What actions does the Navy take to audit the effectiveness of impact avoidance? Is there a periodic monitoring or inspection program, with provision for remedial action should any problems be identified?

2. The DEIS considers potential impacts to ground-disturbing activities "in the immediate area of an archaeological site" (see Section 3.13.2). It does not address the possibility of such activities impacting buried sites. A monitoring program is warranted for areas where previously-undisturbed subsurface areas will be subjected to excavation, grading or similar disturbances. Both archaeological and Native American monitors need to be part of such a monitoring program.

3. Please explain where the collections from previous archaeological investigations on the SSTC are curated. An inspection of the listing of curated collections at the San Diego Archaeological Center identified none of the sites listed (other than an apparent error for SDI-13968, which is listed for a site inventory project on Camp Pendleton). Are the collections curated at another facility meeting the requirements of 36CFR79? If not, what actions will be taken to bring their curation status into compliance with 36CFR79?

P.O. Box 81106 • San Diego, CA 92138-1106 • (858) 538-0935

SDCAS appreciates the opportunity to participate in the navy's environmental review process for this important project.

Sincerely,

James W. Royle, Jr., Chairperson
Environmental Review Committee

cc: SDCAS President
File

P.O. Box 81106 • San Diego, CA 92138-1106 • (858) 538-0935

## E.2.18 San Diego Audubon Society

*Fostering the protection and appreciation* SAN DIEGO AUDUBON SOCIETY *of birds, other wildlife and their habitats...*

March 30, 2010

Naval Facilities Engineering Command, Southwest
Attn: Mr. Kent Randall – Silver Strand Training Complex EIS
1220 Pacific Highway, Building 1, 5th Floor
San Diego, CA 92132

Via email: tory.randall@navy.mil

Dear Mr. Randall:

SUBJECT: Silver Strand Training Complex Environmental Impact Statement dated January 2010

Please withdraw the comment letter that we submitted on March 9, 2010, and replace it with this letter. We appreciate the extension of time for the comments on this EIS.

The San Diego Audubon Society is very concerned with the proposed project. We greatly appreciate the current efforts of the Navy to protect and enhance the safe nesting of California Least Terns and Western Snowy Plovers on the Silver Strand. Section 5.11.1. is a very interesting history of Navy environmental responsibility and leadership. We also appreciate the expanded training needs for the Navy because of our Nation's current high level of military activity. However, we think that the plan needs to be more protective than the current Alternative 1 or 2. Therefore we support the No Project alternative unless Alternate 1 can be improved substantially. We strongly urge that Alternative 2 not be selected because of its large and irresponsible impact on least terns and snowy plovers. The San Diego Audubon Society also supports the Bay Council letter to which we are a cosigner.

**IMPACTS ON LEAST TERNS**

The population of Least Terns has risen substantially over the last 15 years, as the EIS shows. But, the reproduction of Least Terns has generally been declining over the last decade as the EIS also shows. This suggests that the species is not doing nearly as well as it looks. It is also thought that the average age of the birds is increasing, which could reduce future reproductive success. This is clearly not a good time to increase the take of the species, particularly when that take is avoidable. We will be more specific in the following subheadings.

CUMULATIVE IMPACTS NOT ADDRESSED, LEAST TERNS

The EIS provided a long list of likely activities for which the cumulative impacts have been addressed. We are concerned that several very relevant activities were not addressed that, when combined with Alternative 1 or 2 could help put the recovery, and perhaps even the survival of the species in jeopardy.

The U.S. Fish and Wildlife Service has proposed downlisting the least terns from Endangered to Threatened. This would reduce the priority for funds, for priority for other resources such as locations for new nesting areas, negotiating site management agreements, predator management, protection and enhancement of the fish needed for foraging, research, monitoring, planning, analysis, site maintenance, etc. This reduction in resources and priorities will take a toll on the species, in both predictable and unpredictable ways.

Global Climate Change appears to be making the quantity and timing of the supply of small fish for least tern consumption more variable and more uncertain. This affects the likelihood that chicks will survive. Changes are happening very quickly which could leave the entire population more vulnerable.

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The impacts of Gull-bill terns on tern reproductive have been significant and appear to be increasing. There appears to be no real progress toward identifying how to manage the two species to assure the recovery of least terns. This lack of resolution is likely to result in a large and unmanaged take of least terns for at least several years while regulations are developed, reviewed, and finally implemented.

The Recovery Plan for least terns is almost three decades old and is based on outdated information. As a result, there is no effective comprehensive and broadly accepted plan for the recovery of least terns. This deficiency in planning and management means that there is no valid way to conclude that the additional take proposed by Alternatives 1 or 2 will not help put the species in jeopardy.

We urge that the EIS acknowledge each of the additional cumulative impacts mentioned above and incorporate their effects into its analysis.

SPECIES VIABILITY ANALYSIS, LEAST TERNS

The Species Viability Analysis is based on reproduction rates measured in 1981 to 1984, according to page 3.12-21. At this time the productivity was 0.62 fledgling per nest in good years and 0.27 for years dominated by El Nino/Southern Oscillation (ENSO). The ENSO influence was expected about one out of seven years.

According to a figure in the handout from the public presentation, in the last 8, the good years have had productivity around 0.15 for the good years and 0.05 for the bad ones. It appears that we have had 8 bad years in a row vs. the one bad year in seven anticipated in the Species Viability Analysis.

As mentioned above the Species Viability analysis assumes one ENSO year for every 7 normal years. However, some climate models now suggest that with global warming the average may become more like the ENSO state which will make least tern reproduction more difficult.

The model also does not address other trends that could increase the risk to the food supply for least tern recovery such ocean warming, reduced oxygen levels in the ocean, and ocean acidification. Each of these issues suggests that the Species Viability Model is probably wildly optimistic.

We urge that this EIS not conclude that a lower population of least terns will not jeopardize the recovery of the species unless that conclusion can be substantiated with current and relevant data and the best analysis of future trends. Such an analysis should also incorporate the effects of the cumulative impacts listed previously in this letter. Any model used should include the uncertainty range of the input information, the uncertainties of the assumptions the model is based on, how the uncertainties propagate through the model, and the uncertainty of the results. A model that produces a number without clear quantification of the uncertainty of that number will probably be more misleading than useful.

The species viability analysis only appears to address keeping the species from declining to extinction. The purpose of the Endangered Species Act is recovery. This analysis needs to be redirected to identify a population and population growth rate that will lead to a high probability of recovery of CA least terns in a reasonable period of time.

**IMPACTS ON WESTERN SNOWY PLOVERS**

The EIS proposes a maximum number of 22 Snowy Plover nests that will be marked for protection. Other nests, eggs, and chicks will be unmarked. As they are very well camouflaged the destruction of a large number of chicks and eggs appears likely. The EIS fails to provide any analysis to quantify the likely number of unmarked nests, eggs, and chicks in the lanes would destroyed accidentally. But it concludes that this will not be a significant impact with no data or analysis to support this conclusion.

From 2005 to 2009, Snowy Plover population on the West Coast has declined about 13%. The Recovery Plan emphasizes the need for increased protection of nesting areas to allow recovery.

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Backing off on protection of these nests appears to be a significant risk to the viability of this species and directly contradicts the recommendations of the Recovery Plan.

EIS also fails to provide any direct mitigation for the losses of Western Snowy Plovers that will be caused by this project as is required by NEPA. Ironically the protection of these three lanes during nesting season was provided as mitigation for the losses that were anticipated for the other 11 lanes. In view of this, If this project is implemented, we strongly urge that the EIS provide estimates of anticipated losses of WSPs from the training operations on all of the 14 Silver Strand project area and provide adequate mitigation to directly offset those losses in all 14 lanes.

**BIOLOGICAL OPINION NOT AVAILABLE**

The Biological Opinion from the US Fish and Wildlife Service will have an important impact on the future of this project. It is inappropriate that the public must review this EIS without seeing the final Biological Opinion for the project. The BO would provide additional information and the opinion of the FWS. It is essential that reviewers be able to review this opinion and its background information and see how the Navy intends to deal with that opinion.

We strongly urge that the DEIS be recirculated for comment after the BO is received, its results are integrated into the project, and the mitigation is identified. This transparency is especially important for this project in view of its large potential impacts on two very important at-risk species. If the public is only allowed to see this information in the FEIS, there will be no formal comment period, and the public will have been denied the intended benefits of the NEPA process.

**IMPACT OF NOISE AND DISTURBANCE ON LEAST TERNS AND SNOWY PLOVERS**

We were pleased to see the substantial analysis of the average and peak noise resulting from the project in Section 3.6, ACOUSTIC ENVIRONMENT. But we were extremely disappointed to discover that the noise analysis was only related to "sensitive receptors" of the human kind. The EIS provides no analysis to determine if the increases in average noise or peak noise from the increases in gunfire, flares, and detonation would result in a take, or a reduction of reproductive success, of least terns or snowy plovers. This loss could result from either least terns or snowy plovers being deterred from nesting or abandoning eggs or chicks because of the additional noise, either on the ocean side or the bay side of the Silver Strand.

We strongly urge that the EIS include analysis of the indirect take of chicks and eggs that will result from permanent nest abandonment that is likely to result from the increase in noise, both average and peak. We also urge that the EIS include analysis of the indirect take of chicks and eggs that is likely to result from temporary abandonment that would make the eggs and chicks more vulnerable to death from heat, cold, predators, and starvation.

**ALTERNATIVES**

The limited range of alternatives that are presented in the EIS do not provide a reasonable starting point for a productive process to resolve the project's operational and environmental problems. The lack of meaningful alternatives is not consistent with the letter or intent of NEPA. We urge that the EIS alternatives be expanded to lead to a reasonable solution to the Navy's training issues.

The EIS needs to provide an alternative that identifies scheduling efficiencies that will preserve the land portion of blue 2, orange 1, and orange 2 during nesting season. A very large portion of the use of the training area is for physical fitness training which provides considerable opportunities for more efficient use of the area. The EIS's allegation that expanding operations into those three lanes is essential to the mission is not supported by any specific information provided in the EIS.

Many of the missions that are proposed can be accomplished in the water section of the lanes, with virtually no beach access. We urge that the uses of lanes blue 2, orange 1, and orange 2 be limited to those water-only missions during nesting season. Needed access for them could be by boat vs. land. If emergency access is occasionally needed over the beach, that could be considered valid unavoidable "incidental take." Such an alternative should be developed and analyzed.

We also urge that an alternative be analyzed that allows lanes at Camp Pendleton to be used to relieve some of the scheduling pressure on the Silver Strand Beach Lanes without destroying least tern and snowy plover eggs and chicks.

We strongly urge that a set if meaningful alternatives be identified that will address the Navy's training needs in a much more environmentally protective manner. Such an alternative is essential to satisfy the letter and the intent of NEPA.

**MITIGATION FOR LEAST TERNS AND SNOWY PLOVERS**

The mitigation measures for the impacts of this project are defined in section 12.4.1: "Develop a site enhancement plan that includes establishing dunes on the windward edges of Delta North and South that would enhance this area for plovers, create a source of sand for the least tern nesting area, and establish a better visual barrier between SR-75 and the nesting colony."

It is not clear what is meant by "Develop a site enhancement plan..." Does that mean that the enhancement would actually be built? How big? When would it be built? Would it be in place and functioning before Alternative 1 or 2 would be implemented? Would it be maintained in perpetuity, or just constructed? This sort of information about the scale and viability of the mitigation should have been a major element of the EIS.

We would appreciate habitat enhancements. But, is it anticipated that these measures would result in an improvement in productivity in terns and plovers that would offset the anticipated direct and indirect take that would result from Alternative 1 or 2? It appears very doubtful that it would. One of the purposes of the EIS is to identify the net impact of the project with the mitigation. This EIS does not identify the impact and it does not identify how much of that impact is offset by the mitigation. It fails to provide the fundamental elements of an EIS.

A better visual barrier between SR-75 and the nesting colony will also mean a better approach path for avian predators to approach the tern colony without being detected. We doubt that will improve the productivity of the colony. Thus it does not appear to have any value as mitigation.

Section 12.4.2 states: "Vehicle patrolling and LARC V operator training will not occur in Red, Blue, or Orange Beach Lanes." How many least terns of snowy plovers will this save? Will the terns and plovers that are saved by this measure survive the other activities that will occur in these lanes under Alternatives 1 and 2? It does not appear that they would. Again, the EIS fails to identify the impacts of this measure, which is one of its main purposes.

The two mitigation measures in the EIS may tend to reduce or offset the take a little, but they do not appear to minimize or to offset the impacts of the Project. If Alternatives 1 or 2 are adopted in spite of their inappropriate impacts, we urge that mitigation be provided that will actually offset the take that results from those actions.

The EIS does not indicated that any accounting will be done to identify how much of the environmental impact of the project is expected to be offset by the mitigation. How would a regulator or decision maker be able to identify how much environmental impact has occurred and how much has been offset by the mitigation over time? We urge that the EIS provide how such an ongoing net impact assessment will be accomplished to facilitate the adaptive management process that is mentioned.

If the project results in a substantial increase in a net take, or if the viability of the terns and plovers begins to diminish, will the project include additional specific mitigation measures to restore protection of the nesting at the three lanes or more to offset the loss? Though adaptive management is suggested, there are no specifics of what is meant by it for this project.

It appears that there are areas in the SSTC South area that could be used to mitigate for the impacts of this project that would be difficult and costly to use for training. We urge that the Final version of this document explore that possibility.

**IMPACTS ON DIVING BIRDS**

We appreciate the analysis that was performed relating to the impacts of underwater detonations on diving birds and marine mammals. However, we have not had the resources to verify the data, rationale, or conclusions at this time. We also appreciate the plan to discourage diving birds from the exercise area to prevent injuries or death to them.

**PROTECTION OF SENSITIVE PLANT SPECIES**

We do not think that the protection of sensitive dune and upland species proposed by the EIS is adequate, but have not had the resources to comment specifically on them at this time. Volunteer from our chapter spend many hundreds of hours removing invasive vegetation to provide habitat for some of these sensitive plant species. It is disappointing to hear that there will be no protection for these sensitive species in this project.

**IMPACTS ON VERNAL POOLS**

Vernal pools are one of the most endangered habitat types in all of California. These pools house a vast array of life forms, including endangered species like the San Diego Fairy Shrimp. Trails running through the vernal pools will disturb the sensitive hydrology of the pools, even if they are only used during the dry season. Cysts can be crushed and damaged even in the dry season. There is no way to predict the damage that could be caused to the vernal pools by crossing through them, even limited to just the dry season. The complex ecology of vernal pools is easily disturbed. We urge that the vernal pools be fenced, and that crossing of vernal pools be prohibited.

Paragraph 3.11.1.1.1, Regulatory Framework, states that the Fish and Wildlife service may issue a Biological Opinion that will state measures that will avoid or minimize the take of any listed species. Table 3.11-3 acknowledges that Alternatives 1 and 2 could adversely impact individual fairy shrimp. The foot traffic will have direct and indirect impact on the vernal pools, even if the foot traffic through the pools is limited to dry seasons. The direct impact is that cysts will be damaged or destroyed by the foot traffic. This is addressed in the EIS. When people walk through an area that contains weedy species, the seeds of the weeds often attach themselves to the shoes, clothes, and equipment of the people. These seeds drop off as the people walk elsewhere, helping to disburse the weed seeds. The invasion of these weeds can have many negative impacts on the pools, including shadowing, increasing evaporation and transpiration rates, degrading the hardpan, etc. There is no way to minimize this impact. Foot traffic could also wear depressions in the containment mounds of the pools eventually changing the hydrology of the pools, preventing the pooling from occurring. Foot traffic could also change land contours separating a pool from its immediate watershed. The EIS does not address any of these significant impacts as it needs to. Clearly these impacts will progressively degrade the pools and will reduce the likelihood that fairy shrimp will be able to recover.

Clearly, allowing foot traffic through the vernal pools will not "minimize" (as stated several times in the EIS, including Table 3.11-3) the take of fairy shrimp in any sense and is a violation of the Endangered Species Act. Limiting the access to foot traffic in dry weather may slightly reduce it, but that is very far from minimizing it in either a legal or practical sense. Pinocchio got a very long nose when he said things like that.

Unfortunately the EIS does not address the conservation of the pools that are not occupied by fairy shrimp. The objective of the Endangered Species Act is Recovery, not just hanging on, or not facilitating the incremental decline of the species. For recovery to occur, a reasonable amount of unoccupied habitat must be protected to accommodate more populations. We urge that a significant portion of unoccupied and restorable pools be protected as well as occupied pools.

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The survey for fairy shrimp, on which this document is based, was conducted in 2001 and 2003. A more recent survey is required to know how many pools are currently occupied. We urge that decisions be based on a more timely survey.

We strongly urge that the Project require that all occupied, and all unoccupied pools with a reasonable chance of being restored for future occupation, be fully fenced and that regulations be implemented that forbid entry at any time of the year except for needed maintenance or emergencies. We also urge that the watershed of these pools also be protected so the hydrology of these pools and their necessary watersheds will be viable.

If the Project intends to use vernal pools for foot traffic in spite of the potentially serious impacts, we urge that a multi-year experiment be conducted to assess the impacts on a single test pool, and that all other pools be fully fenced and protected until the potential impacts are fully understood and disclosed.

**WHEN THE CURRENT DEMAND FOR BEACH TRAINING RELAXES**

The EIS addresses the need for additional training capability because of the additional deployments to war zones. It does not address returning to the current protection of nesting birds in the three lanes when the need for training is relaxed. If Alternative 1 is adopted, will it be a temporary measure? If Alternative 1 or 2 are implemented, we urge that the EIS contain a commitment that it will revert to the No Project configuration when the need for additional training is reduced in the future.

**CONCLUSION**

This document does not satisfy the letter or the intent of NEPA. We strongly urge that the "No Project" Alternative be adopted. However, it appears that a more thoughtful alternative, with real mitigation measures, could be put together that would allow an increase in the training capacity of the Silver Strand while protecting or even enhancing its extremely valuable natural resources. We encourage the Navy to move in that direction in a future Draft of the EIS.

The Navy has had laudable success in its well conceived and well managed mitigation projects for past impacts to terns and plovers on Silver Stand. It is regrettable that this project will seek to significantly dismantle some of that success.

If the Navy decides to move ahead with the current alternatives, we strongly urge that the next Draft quantify what impacts of the project will and will not be offset by the mitigation proposed. We urge that the Navy then identify mitigation that will fully offset the deficit.

We strongly urge that the Species Viability Model used in this Draft be substantially updated or not used. It is not the least bit certain that the current population of least terns is viable in view of our environmental and climate uncertainties. That model clearly does not provide credible justification to the assertion the species will do just fine with a drop of a couple thousand birds.

In case of questions or follow-up, the undersigned can be reached at 619-224-4591 or peugh@cox.net .

Respectfully,

James A. Peugh

James A. Peugh
Conservation Committee Chair

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## E.2.19 San Diego Bay Council

SAN DIEGO COASTKEEPER Surfrider Foundation San Diego Chapter Environmental HEALTH COALITION COASTAL ENVIRONMENTAL RIGHTS FOUNDATION SIERRA CLUB FOUNDED 1892 SAN DIEGO AUDUBON SOCIETY

# San Diego Bay Council

*A coalition of San Diego environmental organizations dedicated to protection and restoration of San Diego's Coastal water resources.*

March 30, 2010

***Via e-mail to tory.randall@navy.mil***
Kent Randall
Navy Technical Rep
CIV NAVFAC SW,
1220 Pacific Highway, Building 1, 5th Floor
San Diego, CA 92132

**Re: Silver Strand Environmental Impact Statement Comments**

Dear Mr. Randall:

The San Diego Bay Council respectfully submits the following comments on the Navy Silver Strand Draft Environmental Impact Statement. The San Diego Bay Council is a coalition of environmental organizations dedicated to the protection and restoration of regional coastal waters in the San Diego. Member organizations, representing 22,000 San Diegans, act through community involvement, regulatory participation, and legal action to ensure the protection and restoration of San Diego Bay, Mission Bay, and the region's coastal waters.

The San Diego Bay Council recognizes that the Navy desires to protect the environment to the fullest extent possible while training the men and women that protect our nation. But the Navy's analysis in the Silver Strand Draft Environmental Impact Statement falls short of showing how the Navy's plan to expand training at the Silver Strand facility will actually protect the environment.

The San Diego Bay Council has serious concerns with the Navy's plan to vastly expand training activities and frequencies at the Silver Strand Training Complex and the hefty toll it will take on the local community and the environment. The Navy's plan has serious long-term negative impacts to water quality, air quality, endangered species, public access to the ocean, bay, and beaches, noise, traffic, and other aspects of quality of life and the environment.

Despite the voluminous Draft Environmental Impact Statement, the Navy has not taken a hard look at the direct, indirect, and cumulative impacts this increased training will have on the community and the environment. The heart of the National Environmental Policy Act is for the Navy to fully analyze and weigh the consequences of each of its possible project alternatives, before selecting one. As part of this process, the Navy must inform members of the public of the burdens the Navy is expecting it—and the environment it uses and enjoys—to bear as a result of the project, before the project is approved and an alternative selected. Here, the Navy's conclusory "analysis" and lack of meaningful alternatives makes NEPA nothing more than a meaningless exercise and deprives the public of the important information it is entitled to under the law.

While the San Diego Bay Council has a multitude of serious concerns about the Navy's proposed training increased activities and frequencies, this letter focuses on only three of our main concerns. We appreciate the extension the Navy granted so that we could submit these comments, but even with the extension, we were unable to delve into all our concerns in detail. We reserve the right to rely on other comments submitted during the public comment process, and we fully adopt here all comments submitted by the San Diego Audubon Society.

Mr. Kent Randall
Re: Bay Council Comments on Navy Silver Strand Training Complex Draft EIS
March 30, 2010
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## I. The Draft EIS Fails to Analyze Anticipated Water Quality Impacts From Increased Smoke Grenades, Flares, and Surface and Underwater Detonations.

The Navy's proposed ramp-up in training at the Silver Strand Training Complex involves a significant increase in the amount of hazardous ordinance the Navy will be using. For example, the Navy plans to increase the use of smoke grenades and flares from 2,990 pounds to 4,410 pounds. *See* SSTC DEIS at 3.4-13. The smoke grenades and flares may contain aluminum, magnesium, zinc, strontium, barium, cadmium, nickel, and perchlorates. *See* SSTC DEIS at 3.4-11. The Draft EIS states that these hazardous pollutants will not cause any problems because "most of them are present in small amounts or low concentrations...." *See* SSTC DEIS at 3.4-11. The Draft EIS summarily concluded that the "low concentrations of leachable metals" in the No Action Alternatives do not rise to the level of hazardous materials. *See* SSTC DEIS at 3.4-11.

The Draft EIS then deferred to the "Hazardous Waste" analysis in its water quality impacts analysis. *See* SSTC DEIS at 3.5-21. Specifically, the Draft EIS states that the "Hazardous Waste" analysis "concluded that only trace amounts of these residues are deposited on the ranges, and they are not expected to affect surrounding biological or physical resources." *See* SSTC DEIS at 3.5-21. But nowhere does the Navy actually analyze the impact of nearly doubling the amount of pollutants it plans to deposit during training. Instead, the Draft EIS characterizes the pollutants as "trace" amounts and summarily dismisses their potential environmental impact. Even at low concentrations, pollutants can cause serious problems. Because the Navy plans to almost double the amount of pollutants from smoke grenades and flares, it needs to take a hard look at the potential environmental impacts of such a drastic increase in pollution.

Likewise, the Navy plans to double its surface and underwater detonations. *See* SSTC DEIS at 3.5-22, tbl 3.5-7; 3.5-25, tbl 3.5-8. Yet the Draft EIS assumes there will be no measurable impact on water quality, even though "combustion is less than 100 percent and residues of these hazardous materials may remain in the water and sediment." *See* SSTC DEIS at 3.5-25. The Draft EIS provides no support or justification for this conclusion.

The Draft EIS also fails to examine the cumulative, long-term impacts of increasing the amount of pollutants released into the ocean and bay. Under NEPA, the Navy must examine the direct, indirect, and cumulative impacts of its proposed action. Here, the Navy has failed to examine the cumulative impacts of doubling the amount of hazardous pollutants it puts into our waters each year. To satisfy its NEPA requirements, the Navy must fully examine the cumulative impacts of increased water pollution.

## II. The Navy's Proposed Plan Will Interfere With Public Access to the Ocean and Bay.

The Draft EIS states that in total, "training would require closure of portions of the ocean or bay for about 7,500 hours per year" or 312 days per year. *See* SSTC DEIS at 3.5-25. This would mean that portions of the ocean or bay would be closed "for about 85 percent of the year if no training were conducted currently." *See* SSTC DEIS at 3.5-25. The Draft EIS suggests that training will "likely overlap in time in an unpredictable way, which would result in multiple areas being closed for a shorter percentage of the year." *See* SSTC DEIS at 3.5-25.

What the Draft EIS does not address is how many of those hours of closure and training activity would occur during the daylight hours when the public is most likely to use the ocean or bay. If San Diego receives, on average, between seven and ten hours of sunlight per day, that can add up to only around 3,000 hours of sunlight per year.[1] If the Navy plans to close the ocean and bay 7,500 hours per year, it is possible to have the bay and ocean closed during all hours of sunlight in a given year.

[1] Based on San Diego's average conditions, it is estimated that San Diego receives approximately 3,012 hours per year of sunlight. *See* http://www.bbc.co.uk/weather/world/city_guides/results.shtml?tt=TT001510. While these

Disturbingly, the Draft EIS includes—but completely disregards—the City of Imperial Beach's annual estimates of use for shore and nearshore recreation. *See* SSTC DEIS at 3.5-18. Those estimates show that along Imperial Beach's 3.5 miles of beach front, there were 1.8 million beachgoers, 8,000 beach anglers, and 400 fishing boats providing an estimated 10,000 fishing trips. *See* SSTC DEIS at 3.5-18. The Draft EIS ignores the data, claiming it is not "quantitative information on the actual use of ocean waters off Imperial Beach, and may not be representative of other beach areas, such as Silver Strand State Beach or Coronado Municipal Beach." *See* SSTC DEIS at 3.5-18.

By ignoring the best information available on ocean use and recreation, the Draft EIS downplays the impact the proposed project will have on public access to the ocean and bay. The Draft EIS actually suggests that the impact will be negligible because "the size of the water area that would be closed for each training activity is relatively small when compared to the total bay and ocean waters available for the uses described in the *Basin Plan*...." SSTC DEIS at 3.5-26. But the Draft EIS fails to look at the cumulative impact of all the training activities on the waters' designated uses, including recreation. This lack of analysis fails to meet the necessary hard look the National Environmental Policy Act requires.

**III. The Navy Fails to Take a Hard Look at the Impacts of Increased Training on Endangered Species.**

The Navy's plan to expand training activities and increase training frequency will have negative impacts on several endangered species, including the western snowy plover, the California least tern, and the San Diego fairy shrimp. The San Diego Audubon Society has already articulated several concerns we have about the proposed project's impact on endangered species. Among these concerns are cumulative impacts, lack of meaningful alternatives, noise impacts, mitigation, and lack of analysis of the indirect impacts on chicks and eggs abandoned because of increased training activities. We are also seriously concerned about the decline in the number of lest tern fledglings over the past several years. The Navy's analysis fails to address how the increased training will not further exacerbate this serious decline in fledglings. Also, the Navy fails to articulate a well-reasoned, scientifically-based justification for protecting only 22 western snowy plover nests and how that alternative will protect the species. The Navy must take a hard look at the direct, indirect, and cumulative impacts on the western snowy plover and California least tern in order to satisfy its NEPA requirements. Also, the Navy must satisfy its requirements under the Endangered Species Act to protect these endangered birds.

In addition to the snowy plover and the California least tern, the San Diego fairy shrimp also calls Silver Strand Training Complex home. *See* Silver Strand Training Complex Draft EIS (SSTC Draft EIS) at 3.11-13, Fig. 3.11-4. The San Diego fairy shrimp is among the most endangered species in the country; on a scale of 1-18, with one being the highest, the San Diego fairy shrimp ranks as a "2" on the recovery priority scale. *See* SSTC Draft EIS at 3.11-12.

So far, the Navy has taken important steps to protect the San Diego fairy shrimp. Under the current management plan, the Navy "restricts all activities from the [vernal] pools at all times." *See* SSTC Draft EIS at 3.11-33. But now the Navy plans to roll back protections for the San Diego fairy shrimp and "allow foot traffic associated with training activities in vernal pools when conditions are dry." *See* SSTC Draft EIS at 3.11-41. The Navy has failed to explain why it needs to allow foot traffic in vernal pools that house a critically endangered species or how allowing foot traffic in the pool when the Navy deems the pools "dry" protects the San Diego fairy shrimp. By failing to provide this information and analysis, the Navy has failed to take a hard look at the environmental impacts of its proposed increased training.

Mr. Kent Randall
Re: Bay Council Comments on Navy Silver Strand Training Complex Draft EIS
March 30, 2010
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**A. The Navy Fails to Explain Why It Needs to Allow Foot Traffic in the San Diego Fairy Shrimp's Vernal Pools to Meet the Project's Basic Purpose of Improved Training.**

The Navy suggests that it needs to allow foot traffic in the vernal pools because some training activities require space to maneuver. *See* SSTC Draft EIS at 3.11-43. But the Silver Strand Training Complex—South is 548 acres of land, and the San Diego fairy shrimp has been found in vernal pools taking up only around 4 acres of land. *See* SSTC Draft EIS at 1-3; 3.11-13, Fig. 3.11-4. The Navy does not explain why walking in those very small, ecologically fragile areas is fundamental to providing better training. Further, the Navy suggests that allowing foot traffic in the vernal pools is "needed" if "other areas are scheduled and no other training areas are available" *See* SSTC Draft EIS at 3.11-43. In other words, the Navy wants to trade protection of a critically endangered species for added scheduling convenience—for only 11 of the 78 different activities the Navy schedules. *See* SSTC Draft EIS at 3.11-43, 2-26. The Navy also suggests that walking in the vernal pools might be "needed" for "training diversity" without explaining what "training diversity" walking in the vernal pools would provide—other than trampling a fragile ecosystem.

**B. The Navy Fails to Analyze the Impacts to the San Diego Fairy Shrimp of Allowing Foot Traffic in the Vernal Pools When the Pools are "Dry."**

The Navy proposes to allow people to tramp through the vernal pools the San Diego fairy shrimp call home when a botanist or wildlife biologist determines that the pools are "dry." *See* SSTC Draft EIS at 3.11-43. The Navy has not analyzed the environmental impacts of this plan to the existing fairy shrimp populations or to the ongoing viability of the fairy shrimp population at Silver Strand Training Complex—South.

**1. The Navy May Determine the Vernal Pools are "Dry" when Fairy Shrimp are Maturing or Adult Shrimp are Present.**

The Navy anticipates that the vernal pools will be deemed "dry" "50 to 95 percent of the year", which could also include "intermittent times during the rainy season, rather than during a defined dry period." *See* SSTC Draft EIS at 3.11-43. The Draft EIS does not explain how the "qualified person" overseen by a Navy botanist or wildlife biologist will determine when the vernal pools are wet or dry. *See* SSTC Draft EIS at 3.11-43. The fact the Navy anticipates that the pools will be dry up to 95% of the year is problematic.

The Draft EIS recognizes that "[a]dult San Diego fairy shrimp are observed from January to March" but "in years with early or late rainfall, the hatching period may be extended." *See* SSTC Draft EIS at 3.11-12. The Navy's 2002 Integrated Natural Resource Management Plan for the Naval Base Coronado (the "2002 Plan") also acknowledges that San Diego fairy shrimp "may appear after late fall, winter, or spring rains sufficiently fill their small, shallow pools (<30 cm deep)" and "[o]nce hatched, the fairy shrimp will mature in 10–20 days… and can live for over a month." *See* 2002 Plan at 3-76, citing Eriksen and Belk 1999. But the Draft EIS provides no explanation of how the vernal pools could be dry up to 95% of the year when adult shrimp can be observed for at least 25% of the year and possibly in late fall, winter, or spring. Either this means that the Navy anticipates determining the vernal pools are "dry" when there are still adult fairy shrimp present, or the Navy has serious flaws in its analysis.

**2. The Navy Cites No Scientific Evidence That Allowing Foot Traffic Through the Vernal Pools When "Dry" Will Protect the Fairy Shrimp Population.**

The Navy attempts to justify purposely scheduling foot traffic in the vernal pools when the pools are "dry" because "[t]his is the time when the shrimp are least vulnerable because they are encased in hard cysts at or near the soil surface… awaiting the return of wet conditions." *See* SSTC Draft EIS at 3.11-

44. But the Navy provides no evidence that the force of foot traffic through the vernal pools will not crush the fairy shrimp cysts.

On the contrary, it is well-settled that human encroachment into San Diego fairy shrimp habitat on foot or on motorized or non-motorized vehicles affects the species by crushing San Diego fairy shrimp cysts. *See* San Diego Fairy Shrimp 5-Year Review, U.S. Fish and Wildlife Service, 2008 ("5-Year Review") at 28. Scientists have demonstrated that San Diego fairy shrimp cysts can be crushed under minimal weight—less than 100 grams, or 0.2 pounds, of force—when dry. *See* 5-Year Review at 28, citing Hathaway et al. (1996). Because cysts are so fragile, even when the vernal pools are dry, allowing people to walk or run through the vernal pools will crush and destroy the fairy shrimp cysts.[2]

The Navy has not analyzed the short-term or long term impacts of allowing foot traffic in the vernal pools when they are "dry." The Navy "conservatively" estimates that "10 percent of the people conducting training activity would enter into the vernal pools." *See* SSTC Draft EIS at 3.11-43. The Navy provides no explanation of why this estimate is conservative other than "each activity is dispersed across the vernal pool area." *See* SSTC Draft EIS at 3.11-43. And even under the conservative estimate, the Navy still anticipates that 207 people could enter the vernal pools each year. *See* SSTC Draft EIS at 3.11-43.

The Navy has not analyzed what effect moving from no foot traffic to over 200 people tramping through the vernal pools each year will have on the short-term and long-term viability of the San Diego fairy shrimp population. The Navy acknowledges that the fairy shrimp could be negatively impacted by being moved to unsuitable locations or by changing the topography or water quality in the vernal pools, but never acknowledges that foot traffic can and will crush fairy shrimp cysts. *See* SSTC Draft EIS at 3.11-44. Because the Navy ignores the reality that foot traffic in the vernal pools will crush cysts, it never analyzes how devastating foot traffic will be to the long-term viability of the fairy shrimp.

San Diego fairy shrimp cyst "banks" develop in pool soils that are composed of cysts from several years of breeding. *See* 5-Year Plan at 5. This partial hatching of cysts allows the San Diego fairy shrimp to persist in its extremely variable environment, since pools commonly fill and dry before hatched individuals can reproduce, and if all cysts hatched during an insufficient filling the species could be extirpated from a pool. *See* 5-Year Plan at 28, citing Philippi et al. 2001, Simovich 2005a, Simovich and Hathaway 1997. The U.S. Fish and Wildlife Service has emphasized that the ability of San Diego fairy shrimp to develop and maintain cyst banks is vital to the long-term survival of San Diego fairy shrimp populations. *See* 5-Year Plan at 5, citing Ripley et al. 2004, Simovich 2005a.

The Navy must take a hard look at the long-term impacts of foot traffic on the fairy shrimp. The U.S. Fish and Wildlife Service has cautioned that cyst-crushing impacts, like foot traffic, may accumulate over time, leading to a decline of cysts below a number necessary to support a viable population. *See* 5-Year Plan at 17.

The Navy must do a thorough analysis of the impact of its proposed plan on the critically endangered San Diego fairy shrimp. The Navy must at least address the following questions:

- Which vernal pools at Silver Strand Training Complex—South have cysts in them?
- How many steps will be taken in each vernal pool each year?
- How many cysts will be crushed by each footstep in the vernal pool?
- How many cysts are in each vernal pool?
- How many cysts need to survive in order to ensure a long-term viable population of fairy shrimp?

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[2] The American Academy of Podiatric Sports Medicine estimates that, while running, the feet strike at a force of three to four times the body's weight. *See* http://www.aapsm.org/running.html.

- How will the foot traffic in the vernal pools impact fairy shrimp breeding?
- What impact will long-term foot traffic through the vernal pools have on the fairy shrimp population at Silver Strand Training Complex—South?

Answering these questions is crucial not only to comply with the Endangered Species Act, but to meet the National Environmental Policy Act's requirements that the Navy take a hard look at the environmental impacts of its proposed project. Without answering these questions, the Navy cannot meet its National Environmental Policy Act obligations.

**3. The Navy Must Survey Existing Fairy Shrimp Populations in Order to Analyze the Impacts of the Proposed Action on the Fairy Shrimp.**

The Navy's analysis in the Draft EIS is based on a study from 2003 of whether or not the San Diego fairy shrimp was present in a vernal pool. *See* SSTC Draft EIS at 3.11-13 Fig. 3.11-4. Before taking such a drastic measure as to allow foot traffic in the vernal pools, the Navy must gather more updated information about the existing population of fairy shrimp in vernal pools at the Silver Strand Training Complex—South. The Navy should have been monitoring fairy shrimp populations under its plan set forth in the 2002 Plan, as the plan states that the Navy will "monitor the status of the fairy shrimp population." 2002 Plan Coronado at 4-29.

According to the Draft EIS, the Navy plans to start surveying for the fairy shrimp every five years. *See* SSTC Draft EIS at 3.11-43. But relying on 7-year old information as a baseline and then not looking at impacts to the fairy shrimp population for 5 years is insufficient to protect the critically endangered fairy shrimp. In 5 years, the Navy could potentially cause such extensive damage to the fairy shrimp as to devastate the population. This is directly contrary to the Navy's promise in the 2002 Plan to "seek opportunities to restore vernal pool habitats that have been disturbed, while considering potential impacts to the federally endangered San Diego fairy shrimp." *See* 2002 Plan at 4-29.

**C. The Navy's Plan to Allow Foot Traffic in the Vernal Pools is Inconsistent with the Navy's Commitments it Made to Protect the San Diego Fairy Shrimp.**

The Navy's plan to reverse its prior policy of protecting the San Diego fairy shrimp at Silver Strand Training Complex—South reneges promises made to "provide a benefit to the San Diego fairy shrimp." *See* Designation of Critical Habitat for San Diego Fairy Shrimp, 72 Fed. Reg. 70,648, 70,678 (Dec. 12, 2007).

When the U.S. Fish and Wildlife Service designated critical habitat for the San Diego fairy shrimp, it considered designating vernal pools at the Silver Strand Training Complex—South as critical habitat.[3] But the U.S. Fish and Wildlife Service determined that conservation efforts in the 2002 Plan "provide a benefit to the San Diego fairy shrimp." 72 Fed. Reg. 70,678. Based on those conservation measures, the U.S. Fish and Wildlife Service exempted vernal pools at Silver Strand Training Complex—South from critical habitat designation under Section 4(a)(3) of the Endangered Species Act.

Endangered Species Act §4(a)(3)(B)(i) provides that the Secretary of the U.S. Fish and Wildlife Service shall not designate lands controlled by the Department of Defense as critical habitat if the land is: ***(1)*** subject to an integrated natural resources management plan and ***(2)*** if the Secretary determines in writing that such plan provides a benefit to the species. *See* 16 U.S.C. § 1533(a)(3)(B)(i). In 2007, the U.S. Fish and Wildlife Service determined that the 2002 Plan protected and benefitted the San Diego fairy shrimp.

[3] The Silver Strand Training Complex—South was referred to as the "Naval Radio Receiving Facility" in the Federal Register in 2007.

Specifically, the U.S. Fish and Wildlife Service determined that the Navy would protect and benefit the San Diego fairy shrimp because the Navy promised in the 2002 Plan to: ***(1)*** monitor the status of San Diego fairy shrimp populations; ***(2)*** post signs around vernal pools; ***(3)*** advise personnel to keep vehicles on the main roads while traveling through the property; and ***(4)*** seek opportunities to restore disturbed vernal pool habitats while considering potential impacts to the San Diego fairy shrimp. *See* 72 Fed. Reg. 70,678.

The U.S. Fish and Wildlife Service also determined in 2007 that "[a]ctivities occurring on [Silver Strand Training Complex—South] are currently being conducted in a manner that minimizes impacts to San Diego fairy shrimp habitat." 72 Fed. Reg. 70,678. In 2007, management of vernal pools under the 2002 Plan restricted "all activities from the pools at all times." SSTC Draft EIS at 3.11-33.

The Navy's plan to degrade the vernal pools by allowing foot traffic through the pools and authorizing emergency vehicles to drive through the pools is a sharp departure from its prior management. The Navy is essentially pulling a "bait and switch" on the U.S. Fish and Wildlife Service, escaping protective critical habitat designation for its land based on a management plan it is scrapping just three years later. The Navy plans to allow emergency vehicles to drive in the vernal pools, despite the fact that the U.S. Fish and Wildlife Service "consider[s] vehicle use in vernal pool habitat... a substantive threat to the San Diego fairy shrimp." 5-Year Review at 17. And the Navy plans to allow virtually unrestricted foot traffic in the vernal pools without first surveying the extent of existing fairy shrimp populations and analyzing the impact the inevitable crushing of fairy cysts will have on the ongoing viability of the critically endangered San Diego fairy shrimp population at Silver Strand Training Complex—South.

The Navy's plan to allow foot traffic and emergency vehicles in the vernal pools at Silver Strand Training Complex—South could be disastrous for the critically endangered San Diego fairy shrimp. The Navy should abandon this ill-conceived and un-examined plan unless and until it can demonstrate with a thorough and honest analysis that the plan will satisfy the Navy's promise to "provide a benefit to the San Diego fairy shrimp." *See* 72 Fed. Reg. 70,678.

## CONCLUSION

The Navy must analyze the direct, indirect, and cumulative impacts that pollutants from grenades, flares and explosives will have on water quality. It should provide scientifically-supported analysis of those impacts in the final environmental impact statement. The Navy still needs to take a hard look at the impacts the increased training will have on public access to the ocean, bay, and beaches, air quality, traffic, and noise.

The Navy's analysis of the proposed project's impacts to endangered species such as the western snowy plover, the California least tern, and the San Diego fairy shrimp is woefully inadequate. The Navy cannot withhold serious environmental impacts analysis from the public during the NEPA process, regardless of any future plans the Navy might have to work with U.S. Fish and Wildlife Service to satisfy Endangered Species Act requirements. The National Environmental Policy Act requires that the Navy take a hard look at all the reasonably foreseeable environmental impacts of the project—that it look before it leaps—and that the analysis be available to the public to fully vet the information. The Navy has not met its burden with regard to the San Diego fairy shrimp.

Mr. Kent Randall
Re: Bay Council Comments on Navy Silver Strand Training Complex Draft EIS
March 30, 2010
Page 8 of 8

Sincerely,

Bruce Reznik
Executive Director
San Diego Coastkeeper

James A. Peugh,
Conservation Chair
San Diego Audubon Society

Marco Gonzalez
Coastal Environmental Rights Foundation

Laura Hunter
Associate Director
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## E.2.20 Sierra Club, San Diego Chapter

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**San Diego Chapter**
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March 9, 2010

Naval Facilities Engineering Command, Southwest
Attn: Mr. Kent Randall – Silver Strand Training Complex DEIS
1220 Pacific Highway, Building 1, 5th Floor
San Diego, CA 92132

Via email: troy.randall@navy.mil

Dear Mr. Randall:

Subject: Silver Strand Training Complex, Draft Environmental Impact Statement dated January 2010

The San Diego Chapter of the Sierra Club appreciates and welcomes the opportunity to comment on the Silver Strand Training Complex (hereinafter "SSTC") draft environmental impact statement (hereinafter "DEIS"). The Sierra Club would like to recognize and commend the Navy for acting as an environmental steward, protecting and improving the nesting sites of California Least Terns and Western Snowy Plovers on the SSTC, as well as, the current policy restricting all activities from vernal pools regardless of wet or dry conditions. The Sierra Club understands and appreciates that the SSTC area sets forth unique "real world" conditions that are essential in optimized operational readiness for Navy and Marine Corps amphibious, special warfare, and mine countermeasure training.

At this time the Sierra Club is not requesting additional protective measures outside the current prevailing policy. In this regard, we strongly support the No Project alternative unless substantial improvements to the protectionist measures are made to Alternative 1. However, the Sierra Club alternatively makes its position known that Alternative 2 is highly undesirable in large part due to the reckless and permanent damage that will befall the endangered California Least Terns and Snowy Plovers in the project area.

San Diego Country has more endangered species than any other county in the United States. If biodiversity indicates ecological well-being, San Diego County should be diagnosed with a near fatal disease and the only treatment is an aggressive stance for protection and conservation. The proposed increase in training operations has the catastrophic potential of affecting 13-20% of the statewide California Least Tern population as well as some of the most important Snowy Plover nesting habitats in Southern California.

If increased training operations are found to be an absolute necessity, preferential training sites must be identified. Those sites should be areas with the least possible amount of nesting and foraging. In order to properly identify these areas, the Navy must actively engage in research, data collection, and monitoring activities. Upon critical examination of the data collected, optimal nesting and foraging sites can be properly designated and military training can be conducted in accordance with all necessary precautions.

Vernal Pools
Vernal pools are environmentally important and highly sensitive areas. Vernal pools have been around for thousands of years, at their peak there were approximately 28,500 acres of vernal pool habitat in San Diego County. By 1986, only 7% of those acres remained. A 1997 a report indicated that 70% of the remaining vernal pools were found on N.A.S. Miramar or Camp Pendleton. By 1995 95% of the vernal

pools were destroyed. In 2001 it was reported that 2,400 vernal pools existed, and presently only 3% of the area's vernal pools remain.

In order to preserve this ever-diminishing vital natural resource, the Sierra Club endorses the continuation of the Navy's existing policy restricting **all** actives from vernal pools at **all** times. We appreciate the Navy's environmental intentions through the proposed wet season closures of the vernal pools. However, the limited closure is not sufficient to sustain the resource. Several species reside in this habitat, including endangered species like the San Diego Fairy Shrimp (*Branchinecta Sandiegonenis*). The Fairy Shrimp find the vernal pools indispensable to their lifecycle when they are inundated with water as well as when they are dry.

By the Navy's own admonition (see Table 3.11-3) both Alternatives 1 and 2, could adversely impact the Fairy Shrimp. Dry season impacts from potentially high volumes of foot traffic (2 to 207 individuals per year estimation, DEIS 3.11-43) carry with it the high probability of causing an extinction of the species. The fairy shrimp cysts (eggs) can be crushed and damaged, especially during the dry season. Foot traffic through the area would not only result in destruction of the cysts, but also allow for the introduction of invasive weeds, as soils are disturbed and changes to watershed hydrological system occur. As the soldiers traverse through the SSTC they are walking through areas that contain weedy species, and the seeds become attached to the soldier's shoes, clothing, and equipment. The seeds once transmitted to the vernal pools act as an invasive species resulting in shadowing, increased evaporation and transpiration rates, degrading the hardpan. Moreover, the USFWS has recognized that habitat degradation (and loss) is the single greatest threat to a species' survival. The Sierra Club would strongly encourage the Navy to continue working closely with the USFWS to implement the findings of their Biological Opinion when it is completed.

What the plan requires is the designation of an area off-limits form training operations while data is collected and evaluated. The area would consist of all the existing and identified vernal pools. While the Navy does place a limit on the amount of activity when other shoreline areas are occupied, unavailable, or less suitable for training, this limitation merely bestows unfettered discretion and no actual limitations. An appropriate method, which should be explored as an alternative, in order to protect vital natural resources and critical habitat, is placing and maintaining, clearly designated barriers within 100 feet of the vernal pools and their functional watershed.

It is also strongly suggested that the Navy conduct new baseline studies, since those studies currently in use were conducted over seven years ago, between 2001 and 2003. Thus, the current conditions remain unknown and the only means of arriving at an adequate accounting of the pools, which currently contain Fairy Shrimp, is to conduct a more recent survey. Until such time that a sufficient and timely survey has been performed, all pools exhibiting reasonable conditions for habitability by Fairy Shrimp should be fenced for protection of the species.

It is unwise to estimate the damage that could be caused to the complex ecology of the vernal pools from increased foot traffic. The Navy should proceed with their existing policy: restricting all activities from the pools at all times. If the Navy plans to proceed with the increased training operations within areas where vernal pools are known to exist, a multiyear analysis must be performed in order to fully evaluate the adverse impacts to the fairy shrimp and to the basic hydrology of the pools.

The Navy must also make note that species on the threatened and endangered lists are to be protected so they may achieve such numbers as to be delisted. The only methodology capable of achieving this goal is to protect their critical habitats. In the case of the San Diego Fairy Shrimp that critical habitat is the vernal pools during both the wet and dry periods.

It is kindly requested that the Navy respond to the comments offered throughout this letter. At this time the Sierra Club would make an additional request in support of response to comments referencing numerous other significant and inadequately addressed environmental impacts associated with the SSTC DEIS by The Southwest Wetlands Interpretive Association, Sustainable Wildlands United and The San Diego Audubon Society. The Sierra Club shares the San Diego Audubon Society's well-founded concern relating to inadequate noise assessment in Section 3.6 Acoustic environment. Sierra Club reaffirms the directive to perform a noise study on indirect impacts of the increase in average noise and/or peak noise from the increased gunfire, flares and detonation on the least terns and snowy plovers eggs and chicks.

Thank you for your consideration of these comments.

Respectfully Submitted,

Pamela N. Epstein

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Prepared by:
Pamela N. Epstein, Esq., LL.M

**The San Diego Chapter of the Sierra Club is San Diego's oldest and largest grassroots environmental organization, founded in 1948. Encompassing San Diego and Imperial Counties, the San Diego Chapter seeks to preserve the special nature of the San Diego and Imperial Valley area through education, activism, and advocacy. The Chapter has over 14,000 members. The National Sierra Club has over 700,000 members in 65 Chapters in all 50 states, and Puerto Rico.**

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## E.2.21 Southwest Wetlands Interpretive Association

SWIA

March 4, 2010

Mr. Kent Randall
Naval Facilities Engineering Command Southwest
Code: OPME
2730 McKean St. Bldg. 291
San Diego, CA 92136-5198

Dear Mr. Randall

The Southwest Wetlands Interpretive Association (SWIA) appreciates the opportunity to comment on the Draft Environmental Impact Statement for the Silver Strand Training Complex, SSTC. SWIA has had the opportunity to work with the US Navy, USN, for over 30 years at the Tijuana Estuary and San Diego Bay. SWIA along with the Navy and a number of other agencies and jurisdictions serves on the Management Authority at the Tijuana River National Estuarine Research Reserve, TRNERR.

SWIA worked with the Navy, the US Fish and Wildlife Service, USFWS, the California Department of Fish and Game, CDFG and the California Department of Parks and Recreation, CDPR, to establish the Tijuana Slough National Wildlife Refuge in 1980, the TRNERR under the National Oceanic and Atmospheric Administration, NOAA, in 1981 and the San Diego Bay National Wildlife Refuge in 1999. SWIA has been directly involved with the Marine Life Protection Act establishing Marine Protected Areas off the coast of California. Again the Navy was directly involved in this process.

SWIA realizes that SSTC is a critical program training area that is difficult or cannot be duplicated anywhere else. We realize that the mission is to support USN and Marine Corps amphibious, special warfare and mine countermeasure training.

SWIA also realizes that the USN has jurisdiction over lands from the international border to Orange County that are critical for maintaining and protecting some of the most important habitat types supporting many endangered and threatened species in Southern California. Biodiversity is an indicator of ecological health and endangered and threatened species like the Least Tern and Western Snowy Plover are indicative that the health of an ecological complex is at risk. San Diego County has more endangered species than any county in the United States.

SWIA views the USN not only as a military security force but also as an ecological security force. The USN, USFWS, biological contractors and other agencies have worked very well together to address, maintain and enhance ecological protection. We hope that these relationships will continue as we proceed even with the additional training at SSTC.

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There is concern that potential additional operations could affect 13-20% of the statewide California Least Tern Population as well as some of the most important Snowy Plover nesting habitat in southern California but through cooperative effort with agencies like the USFWS this may be resolved.
It is assumed the effects of training on Least Tern nesting sites at lanes 1-7 north of Silver Strand State Beach, SSSB, are compatible. Is there enough research data to support the concept of compatibility between tern nesting and training exercises at this site? This makes the important assumption that these birds are able to adapt to these activities without disruption which is important to know as training escalates. It is our hope that research and data collection will be carried out at this site and help answer these important questions about bird adaptation and military training.

We hope that there will be a high level of protection for Least Tern nesting and foraging including lanes 8 through 10.

Preferential training should be considered in lanes with the least nesting and foraging. But research, data collection and monitoring should lead to better management enhancing training and environmental protection.

We also want to encourage a high level of protection at Delta II North and Delta I South. These have been successful nesting and recruitment sites and we hope that they will continue to be maintained through management, and monitoring.

We hope that ongoing operations will be designed to maintain optimal nesting and foraging while carrying out the military mission.

Other issues that must be addressed include protection of vernal pools, predation and use of military working dogs.

We believe that vernal pools should be monitored and that research data collection will enable a reasonable approach to management meeting the needs of military operations and environmental protection. These sensitive habitats should be incorporated into biological off limit areas for training while data collection is evaluated.

Predation is a serious problem. The Gull Billed Tern presents a danger for tern and plover chicks. It is not a listed species at this date but is under consideration. Predation is exacerbated by habitat loss for all these species and this problem must also be addressed.

Using the Endangered Species Act to protect a species must be solely a decision made by qualified scientists. The decision to list or delist a species must be made by the recovery team and should never be influenced by political policy and or public pressure.

The utilization of military working dogs should be coordinated in a way that does not lead to environmental impact.

The impact on near shore habitat and the interrelationship between the marine and beach ecosystems must be taken into consideration. This is especially important concerning least tern foraging. There is also interest in looking at the impact commercial bait fishing has on least tern foraging along the Silver Strand and the barrier beach at the Tijuana Estuary. The opportunity for research at these two sites has been suggested allowing for a comparative analysis of tern foraging success. Commercial bait fishing and military operations may impact tern foraging. Both sites are important to the bait fishing industry.

The potential impact of climate change and sea level rise is of great importance to extended use of the Silver Strand for military operations and as a nesting site for terns and plovers. Sea level rise will have ecological and military impacts at this site. The rise in sea level is at least 10 cm higher than it was in 1974 which is significant. This number is with reference to the TRNERR site which is relevant to the Silver Strand and the Cities of Imperial Beach and Coronado.

The SSTC-South is also an important issue. There are Western Snowy Plover nests on the beaches at this site. The Navy has not been able to control civilian recreational beach use and off leash dogs. This has been a major issue with the destruction of nests and has led to low population success. A coordinated effort should be made to control this site. The YMCA Camp Surf should be able to continue their youth program but must follow the rules. Violations would lead to potential closure of the site.

We want to encourage the Navy to work closely with the USFWS and implement the findings in the Biological Opinion when it is completed.

The City of Imperial Beach has worked with the Navy in the past to establish a dog park near the base entry off Silver Strand Blvd. If the legal issues could be worked out between the Navy and the City this would enable people to use the dog park rather than the beach especially during the nesting season.

The City and SWIA would also like to work with the Navy on completion of the Coast Trail from Oregon to Mexico. This is dependent upon the ability of the City, County and State to work with the Navy allowing this trail to cross Navy lands on the Silver Strand. The trail concept would go between the eastern Navy fence boundary and Highway 75 then continue to the area previously described as the dog park. From there it would go along Carnation Ave outside Navy land. See the included map.

The Dog Park and the coastal trail would help to mitigate recreational beach use and hence allow military operations and protection of plover nesting sites. The dune system from the Coronado/Imperial Beach City boundary to the Silver Strand State beach is in better condition than most dune systems in San Diego County but they are heavily invaded by non native species. State Parks has done a commendable job restoring the dunes along their beach. It is hoped that the Navy and state might be able to look at similar dune enhancement on the Navy lands.

The City of Imperial Beach is concerned about increased noise levels as operations are enhanced. We urge the Navy to install a 10:00 PM curfew on high decibel activities. Neighbors need their sleep in order to be ready for work the next day. This is a reasonable request in a suburban area.

In conclusion SWIA suggests an organization like the Management Authority that currently exists at the TRNERR be established on Silver Strand. The Navy has been a member of this body since its inception in 1982. This organizational structure has worked successfully to resolve many issues in a way conducive to carrying out the missions of international, federal, state and county agencies, NGO'S, universities, private contractors and jurisdictions including San Diego County, and the Cities of Imperial Beach and San Diego. It also serves as an important forum for public input and can solve problems in their early stages. SWIA played an important role in helping to formulate the TRNERR Management Authority and would be interested in helping to do the same at the Silver Strand site.

Again SWIA appreciates this opportunity to give input on this draft document.

Sincerely,

Michael A. McCoy, DVM

Michael A. McCoy, DVM
President: Southwest Wetlands Interpretive Association

## E.2.22 Sustainable Wildlands United

**_Sustainable Wildlands United_**

March 8, 2010

Naval Facilities Engineering Command, Southwest
Attn: Mr. Kent Randall – Silver Strand Training Complex EIS
1220 Pacific Highway, Building 1, 5th Floor
San Diego, CA 92132

Submission Via Email: tory.randall@navy.mil

**RE: Silver Strand Training Complex, Draft EIS January, 2010**

Dear Mr. Randall:

The affiliated organizations/advisors of Sustainable Wildlands United offer the following comments upon the draft EIS.

Vernal Pools

While we appreciate the proposed wet season closure of vernal pools, the closure is not sufficient to sustain the resource. The existing policy restricting all activities from vernal pools at all times should be maintained. Dry season impacts from potentially high volumes of foot traffic (12 to 207 individuals per year estimation, DEIS 3.11-43) would result in mortality of the endangered San Diego fairy shrimp. Crushing of fairy shrimp cysts, introduction of invasive weeds as soils are disturbed and changes to watershed hydrological systems would occur relative to patterns of ground impacts. The impacts associated with establishing repetitive seasonal foot traffic are likely to lead to the loss of San Diego fairy shrimp from the site. The USFWS has acknowledged that habitat *degradation* (and loss) is the greatest ongoing threat to species survival.

To achieve effective and real avoidance, please place and maintain barriers that notice and identify vernal pools and their functional watershed within 100 feet, and maintain existing policy restricting all activities at all times.

For any vernal pool that absolutely cannot be avoided, annual baseline surveys should be conducted. In the event of a survey showing a decline in San Diego fairy shrimp from the previous year, activities should be halted until surveys demonstrate recovery to baseline levels. The proposed surveys in five-year intervals are too infrequent to timely detect significant decline. Annual surveys could allow implementation of protective adaptive management measures to attempt recovery.

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Conservation Advisors: Ellen T. Bauder, PhD – Plant Ecologist, San Diego State University Research Associate; James A. Peugh, S.D. Audubon Society; Pamela N. Epstein, Sierra Club – S.D. Chapter; Richard W. Halsey, California Chaparral Institute; John Buse, Center for Biological Diversity; Van K. Collinsworth, M.A., Preserve Wild Santee.

***Sustainable Wildlands United***

California Least Terns

The proposed action has the potential to adversely affect a very substantial portion of the statewide California least tern population. The federally-listed endangered least tern is a noteworthy Endangered Species Act success story in terms of breeding pairs, but it has not fully recovered, and as the DEIS indicates (3.12-18), fledgling rates have remained static or declined in recent years.

Unfortunately, the DEIS discusses the effects of the proposed action on least tern recovery primarily in terms of breeding pairs rather than reproductive success. Reproductive success rates should be an additional criterion for determining the significance of the action's impacts. In addition, the EIS should evaluate the potential for the action to contribute to impacts to least terns through increased predation or other indirect effects.

Greater noise from operations are likely to reduce nest productivity for least terns and due to temporary and permanent nest abandonment that leaves eggs and chicks vulnerable to predators. The DEIS, however, omits discussion of noise impacts to these sensitive biological receptors. The EIS should analyze and mitigate for this impact.

We appreciate the inclusion of avoidance measures in Alternative 1, but remain concerned that the loss of up to 105 least tern nests would represent a significant impact to the species and would impede recovery of the least tern. Additional least tern mitigation or avoidance measures should be incorporated in Alternative 1.

Western Snowy Plovers

As noted for the least tern, the EIS should evaluate the potential for the action to contribute to impacts to snowy plovers through increased predation (including predation by least terns) or other indirect effects. In addition, the EIS should include a thorough analysis of the direct and indirect noise effects on snowy plovers, and adopt additional mitigation measures for these impacts.

Thank you for considering these comments,

/s/
Van K. Collinsworth, M.A., Conservation Director, Sustainable Wildlands United
Resource Analyst, Executive Director, Preserve Wild Santee

/s/
Ellen T. Bauder, PhD – Plant Ecologist, San Diego State University Research Associate

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Conservation Advisors: Ellen T. Bauder, PhD – Plant Ecologist, San Diego State University Research Associate; James A. Peugh, S.D. Audubon Society; Pamela N. Epstein, Sierra Club – S.D. Chapter; Richard W. Halsey, California Chaparral Institute; John Buse, Center for Biological Diversity; Van K. Collinsworth, M.A., Preserve Wild Santee.

***Sustainable Wildlands United***

/s/
James A. Peugh, Conservation Committee Chair, San Diego Audubon Society

/s/
Pamela N. Epstein, Esq., LL.M, Legal Committee Chair, Sierra Club - San Diego Chapter

/s/
Richard W. Halsey, California Chaparral Institute

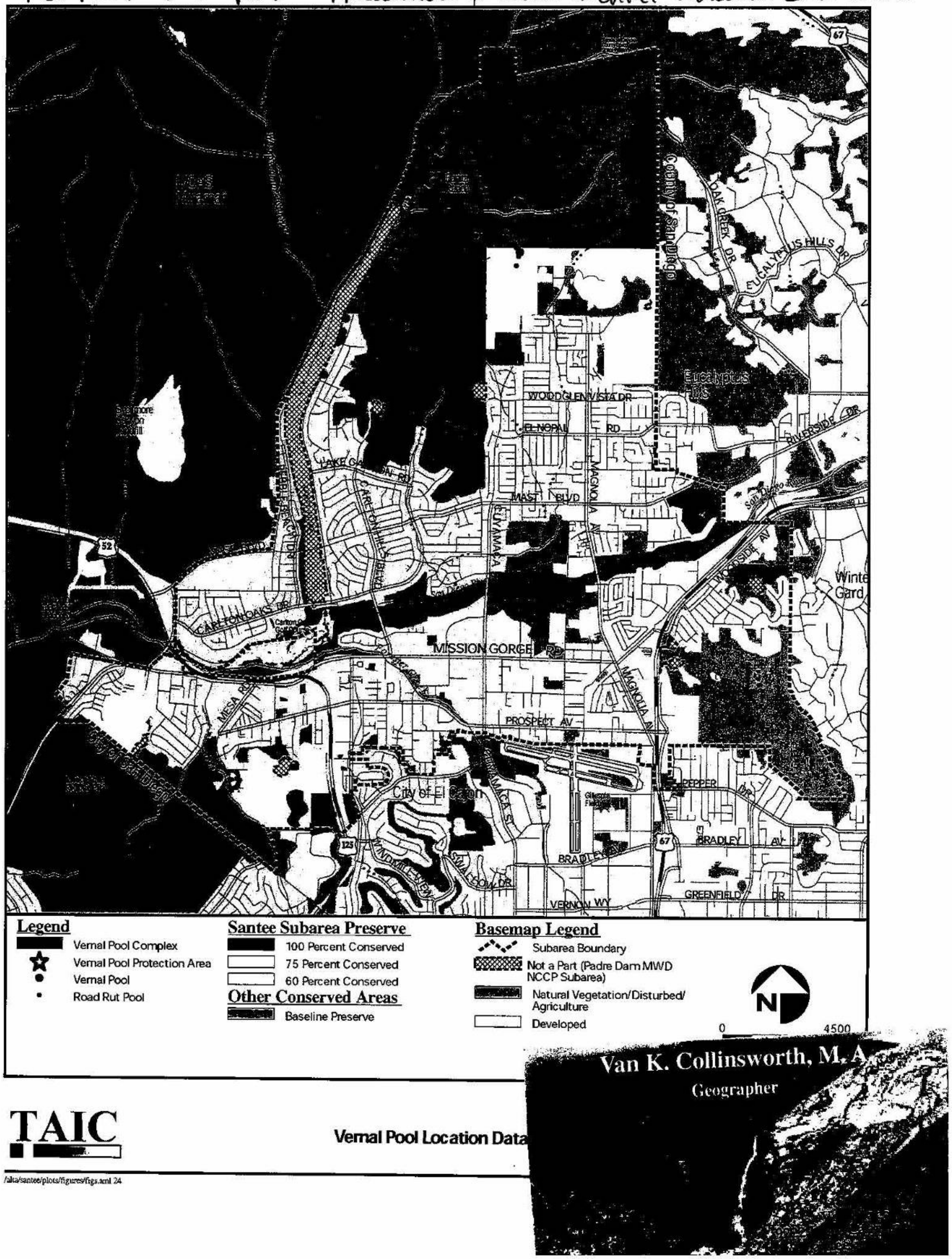
/s/
John Buse, Senior Staff Attorney, Center for Biological Diversity

9222 Lake Canyon Road, Santee, CA 92071 Tel/Fax (619) 258-7929

Conservation Advisors: Ellen T. Bauder, PhD – Plant Ecologist, San Diego State University Research Associate; James A. Peugh, S.D. Audubon Society; Pamela N. Epstein, Sierra Club – S.D. Chapter; Richard W. Halsey, California Chaparral Institute; John Buse, Center for Biological Diversity; Van K. Collinsworth, M.A., Preserve Wild Santee.

## E.2.23 Sustainable Wildlands United

Vernal Pool habitat on Fanita Ranch is for sale
Perfect fit for "Readiness & Environmental Protection Initiative



## E.2.24 Sustainable Wildlands United

Representing: Organization

Organization: Sustainable Wildlands United

Name: Van Collinsworth

Date: 3/9/2010 5:56:43PM

Subject: Military Training Activities

Comment: March 8, 2010 Naval Facilities Engineering Command, Southwest Attn: Mr. Kent Randall – Silver Strand Training Complex EIS 1220 Pacific Highway, Building 1, 5th Floor San Diego, CA 92132 Submission Via Email: tory.randall@navy.mil RE: Silver Strand Training Complex, Draft EIS January, 2010 Dear Mr. Randall: The affiliated organizations/advisors of Sustainable Wildlands United offer the following comments upon the draft EIS. Vernal Pools While we appreciate the proposed wet season closure of vernal pools, the closure is not sufficient to sustain the resource. The existing policy restricting all activities from vernal pools at all times should be maintained. Dry season impacts from potentially high volumes of foot traffic (12 to 207 individuals per year estimation, DEIS 3.11-43) would result in mortality of the endangered San Diego fairy shrimp. Crushing of fairy shrimp cysts, introduction of invasive weeds as soils are disturbed and changes to watershed hydrological systems would occur relative to patterns of ground impacts. The impacts associated with establishing repetitive seasonal foot traffic are likely to lead to the loss of San Diego fairy shrimp from the site. The USFWS has acknowledged that habitat degradation (and loss) is the greatest ongoing threat to species survival. To achieve effective and real avoidance, please place and maintain barriers that notice and identify vernal pools and their functional watershed within 100 feet, and maintain existing policy restricting all activities at all times. For any vernal pool that absolutely cannot be avoided, annual baseline surveys should be conducted. In the event of a survey showing a decline in San Diego fairy shrimp from the previous year, activities should be halted until surveys demonstrate recovery to baseline levels. The proposed surveys in five-year intervals are too infrequent to timely detect significant decline. Annual surveys could allow implementation of protective adaptive management measures to attempt recovery. California Least Terns The proposed action has the potential to adversely affect a very substantial portion of the statewide California least tern population. The federally-listed endangered least tern is a noteworthy Endangered Species Act success story in terms of breeding pairs, but it has not fully recovered, and as the DEIS indicates (3.12-18), fledgling rates have remained static or declined in recent years. Unfortunately, the DEIS discusses the effects of the proposed action on least tern recovery primarily in terms of breeding pairs rather than reproductive success. Reproductive success rates should be an additional criterion for determining the significance of the action's impacts. In addition, the EIS should evaluate the potential for the action to contribute to impacts to least terns through increased predation or other indirect effects. Greater noise from operations are likely to reduce nest productivity for least terns and due to temporary and permanent nest abandonment that leaves eggs and chicks vulnerable to predators. The DEIS, however, omits discussion of noise impacts to these sensitive biological receptors. The EIS should analyze and mitigate for this impact. We appreciate the inclusion of avoidance measures in Alternative 1, but remain concerned that the loss of up to 105 least tern nests would represent a significant impact to the species and would impede recovery of the least tern. Additional least tern mitigation or avoidance measures should be incorporated in Alternative 1. Western Snowy Plovers As noted for the least tern, the EIS should evaluate the potential for the action to contribute to impacts to snowy plovers through increased predation (including predation by least terns) or other indirect effects. In addition, the EIS should include a thorough analysis of the direct and indirect noise effects on snowy plovers, and adopt additional mitigation measures for these impacts. Thank you for considering these comments, /s/ Van K. Collinsworth, M.A., Conservation Director, Sustainable Wildlands United Resource Analyst, Executive Director, Preserve Wild Santee /s/ Ellen T. Bauder, PhD – Plant Ecologist, San Diego State University Research Associate /s/ James A. Peugh, Conservation Committee Chair, San Diego Audubon Society /s/ Pamela N. Epstein, Esq., LL.M, Legal Committee Chair, Sierra Club - San Diego Chapter /s/ Richard W. Halsey, California Chaparral Institute /s/ John Buse, Senior Staff Attorney, Center for Biological Diversity

## E.2.25 United States Department of the Interior

United States Department of the Interior

OFFICE OF THE SECRETARY
Office of Environmental Policy and Compliance
Pacific Southwest Region
1111 Jackson Street, Suite 520
Oakland, California 94607

IN REPLY REFER TO:
ER10/112

*Hardcopy*

10 March 2010

Mr. Kent Randall
Naval Facilities Engineering Command, Southwest
Silver Strand Training Complex EIS
1220 Pacific Highway, Bldg. 1, 5th floor
San Diego, CA 92132

Subject: Review of Draft Environmental Impact Statement (DEIS) for the Silver Strand Training Complex, San Diego, CA

Dear Mr. Randall:

Please disregard the Department of the Interior's no comment letter sent electronically on March 8, 2010. Please consider these comments from the U.S. Fish and Wildlife Service.

The San Diego Bay National Wildlife Refuge includes the South San Diego Bay Unit, located at the southern end of San Diego Bay. The 2,300-acre refuge unit includes open bay, solar salt evaporation ponds (salt ponds), and downstream end of the Otay River floodplain. Salt ponds consist of diked open water cells with differing levels of salinity, which provide roosting habitat for a variety of migratory birds during high tide, supplemental foraging habitat for various shorebirds, and primary foraging habitat for other species such as phalaropes and eared grebes.

Salt pond levees also provide nesting habitat for a variety of ground nesting birds, including the endangered California least tern, the threatened western snowy plover, and an array of other tern species, some of which only nest in a few locations in the United States. The American Bird Conservancy has designated the South San Diego Bay Unit as a Globally Important Bird Area due to presence of globally significant numbers of nesting gull-billed terns and continentally significant numbers of surf scoters, Caspian terns, and western snowy plovers.

The entire southern end of San Diego Bay, including Sweetwater Marsh and South San Diego Bay Units, has been recognized as a Western Hemisphere Shorebird Reserve Network Site.

The primary issue of concern is the U.S. Navy's proposal to significantly expand training activities utilizing helicopters at Silver Strand Training Center (SSTC) South. The U.S. Navy's

SSTC South is located immediately west of the South San Diego Bay Unit. The Kaufman Drop Zone, which is located in SSTC South, would experience an increase in helicopter activities based on the DEIS. Proposed changes would result in helicopter activities increasing from 724 flights per year to 1,262 flights per year with actual landings increasing from 4 lands per year to 40 landings per year.

It is not clear from information provided what percentage of helicopter flights and landings would occur in SSTC South as compared to SSTC North. Additionally, specific training exercises (e.g., Tactical Recovery of Aircraft and Personnel and Amphibious Raid) would employ between 5 and 16 helicopters at a given time which may fly over the South San Diego Bay Unit. When approaching from the bay side to land at the Kaufman Drop Zone, helicopters may fly low over the South San Diego Bay Unit.

These low-altitude flights have potential to adversely affect Refuge resources (e.g. nesting migratory birds, federally endangered California least tern, and federally endangered western snowy plover).

The Service is providing the following recommendations to address concerns presented in this comment letter.

1. The Final EIS should include a map depicting anticipated helicopter flight routes and heights at SSTC South. The Service recommends flight routes avoid flying over South San Diego Bay Unit and instead travel to SSTC South along routes that avoid important wildlife areas or via the Pacific Ocean. We believe these alternative flight routes would reduce impacts of expanded helicopter training on South San Diego Bay Unit.

2. The Final EIS should describe the San Diego Bay National Wildlife Refuge South San Diego Bay Unit in the Affected Environments section. While the DEIS recognizes the Refuge, significant biological resources within this Unit should be fully described. We recommend the Final EIS provide a thorough analysis of effects resulting from proposed expanded training on Refuge resources (e.g., nesting migratory birds, federally endangered California least tern, and federally threatened western snowy plover). We believe that expanded training activities may affect listed species on the South San Diego Bay Unit and recommend the Navy consult under section 7 of the Endangered Species Act with our Carlsbad Fish and Wildlife Office.

The Service appreciates the opportunity to comment on this DEIS. If you have any questions, please contact Kurt Roblek at (619) 575-2704.

Sincerely,

Patricia Sanderson Port

Patricia Sanderson Port
Regional Environmental Officer

- 2 -

## E.2.26 Vernal Pool Society

VERNAL POOL SOCIETY

VERNAL POOL SOCIETY
Mary Anne Pentis, president
Al Pentis, wetlands biologist
PO Box 2154
Ramona, CA 92065
760-789-4085
pentis@hotmail.com

NAVAL FACILITIES ENGINEERING COMMAND, SOUTHWEST
ATTN: Mr. Kent Randall - Silver Strand Training Complex EIS
1220 Pacific Highway, Building 1, 5th Floor
San Diego, CA 92132

March 5, 2010

RE: SILVER STRAND TRAINING COMPLEX DRAFT ENVIRONMENTAL IMPACT STATEMENT (DEIS) 5090 Ser No1CE1/046 14 Jan 10

We appreciate the opportunity to comment on the DEIS referenced above. Our expertise has been in the area of wetlands, marine environments, and vernal pool ecosystems. We have been involved with the protection of endangered and threatened species and their necessary supporting environments and ecosystems for more than 40 years, particularly in the San Diego County region.

As an example, during the late 1960s and 1970s we were instrumental in protecting the endangered California Least Tern nesting sites in San Diego County, particularly those that remained in Mission Bay, San Diego. At this time we formed citizen patrols to protect the nesting birds, their eggs and their chicks. After bringing continuous attention to the need to preserve and protect these dwindling impacted nesting areas, the State of California, in conjunction with the US Fish & Wildlife Service, formed the Least Tern Recovery Team. Consequently, some remaining areas were designated as protected California Least Tern nesting sites, and some have subsequently afforded the endangered Snowy Plover protection in these areas as well.

For the past 20 years we have been actively educating the public and our decision makers to the plight of our endangered Fairy Shrimp and their Vernal Pool Ecosystems. With less than 2% (two percent) of these unique biomes remaining in San Diego County we worked with the agencies and municipalities to help bring the Multiple Species Conservation Plan (MSCP) to fruition.

Specifically we've noted that present vernal pool sites will be subjected to foot-traffic only during the dry season months; such activity would eventually destroy the dry pool pan and make the necessary accumulation of rain water eventually impossible; the subject here is the **survival of vernal pools**. Also, vehicular and/or foot-traffic would destroy an intolerable, even though unspecified, percentage of the cyst embryos.

We, of course, recognize the need for trained United States Navy personnel; God bless them; however, we believe the proposed Naval Training activities within the Silver Strand Training Complex and southern near shore areas of Naval Air Station North Island expansions (the specific vernal pool subject herewith) will have a **NEGATIVE impact** on the endangered species which rely on these areas to at least sustain their populations.

Under **Table ES-2: Summary of Effects 3.11 Birds,** there is no way that this statement in regards to "Birds" from Alternative I and/or Alternative II can be relied upon: "...Loss in California least terns nesting would not decrease the nesting total below the 5,722 annual nests to maintain a stable range wide population, and would be below the 2007 incidental take allowance issued by the USFWS. ..."

Unforeseen impacts will always occur and the populations will continue to be unable to sustain themselves in the long term.

Nor is there any reasonable assumption that the following stated impacts from **Table ES-2: Summary of Effects 3.11 Terrestrial Biological Resources** under Alternative I and/or Alternative II, particularly to Vernal Pool species can be relied upon:

"... • Foot traffic in vernal pool areas could adversely impact individual fairy shrimp. However, impacts would be minimized, due to the low levels of foot traffic that would occur in the pools, and the limitation of those activities to when the vernal pools are dry. Potential impacts to the San Diego fairy shrimp are also associated with emergency vehicle use of unpaved roads in the vernal pool area.

• Potential increased training on SSTC-N beach lanes Blue 2, Orange 1, and Orange 2 could increase impacts to special status plants and invertebrates in these areas while decreasing impacts at other locations. Some trampling of vegetation at these locations is expected, though the overall effect on non-avian biological resources is expected to be short term and of moderate intensity due to the potential overlap of concentrated activities in the dunes and upper beach areas. These activities do not pose long term impacts, effects are expected to be temporary and cease at the termination of an activity.

• Increased foot traffic could cause behavioral impacts to surrounding wildlife, though this effect is expected to be temporary. • Various activities have the potential to impact Brand's phacelia on the beach in the Bravo training area. ..."

There is no logical reason to assume that the proposed Mitigation measures will negate any impacts which occur despite the Navy's and US Fish & Wildlife Service' best intentions.

As to the MITIGATION pleading , we have been of the opinion that no such procedure is any longer viable and therefore not even a conceivable solution for requesting any form of vernal pool destruction permit. The vernal pools that have thus far survived the onslaught of civilization's encroachments have already left them with, we believe, less than 1% (one percent) of their original population. These vernal pool creatures are not just Endangered but CRITICALLY ENDANGERED, and ALL vernal pools are to be protected, NONE available to be offered for mitigation. Upon investigation past mitigation attempts are failures.

The species in question and their necessary, supporting ecosystems which remain today require all the protection we can afford them. They CANNOT accept any further impacts if we wish to have any hope for their continued existence let alone expectations for their Recovery.

Therefore, we recommend the NO ACTION ALTERNATIVE.

Mary Anne Pentis

Mary Anne Pentis, President

Al Pentis

Al Pentis, Wetlands Biologist

# E.3 PUBLIC HEARING COMMENTS

### E.3.1.1 Imperial Beach

REPORTER'S TRANSCRIPT OF PUBLIC HEARING

RE: SILVER STRAND TRAINING COMPLEX
DRAFT ENVIRONMENTAL IMPACT STATEMENT

TUESDAY, FEBRUARY 23, 2010
IMPERIAL BEACH, CALIFORNIA

REPORTED BY REGINA L. GARRISON, CSR NO. 12921

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REPORTER'S TRANSCRIPT OF PUBLIC HEARING, commencing at the hour of 4:00 p.m., on Tuesday, February 23, 2010, at 825 Imperial Beach Boulevard, Imperial Beach, California, before Regina L. Garrison, Certified Shorthand Reporter in and for the State of California.

I N D E X



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(5:08 P.M.)

ORAL COMMENTS

* * * * *

ZEKE MAZUR
522 Seventh Street, Apartment E
Imperial Beach, California

MR. MAZUR: They were talking about having training sessions on the beach, exclusive training sessions. They don't want people around. I think it would be a good idea to have them notify the Union Tribune -- I can't tell if I'm going too fast -- notify and put that on the weather page where they have water temperatures, tide heights and polluted beaches. It would be nice if they had a notice that Silver Strand area is going to be off limits to the public during such and such times. Thank you.

* * * * *



(6:03 P.M.)

WELCOME TO PUBLIC HEARING

* * * * *

MR. MICHAELSON: Good evening and thank you for coming tonight. My name is Lewis Michaelson, and I will be the moderator for tonight's hearing on the Navy's Silver Strand Training Complex draft environmental impact statement, which you will hear referred to tonight as the draft EIS.

Here to receive your comments are Captain Yancy Lindsey, commanding officer at Naval Base Coronado, and Ms. Delphine Lee, project manager for the Navy's Pacific Fleet. We also have Mr. Kent Randall. He's the project coordinator from Naval Facilities Engineering Command Southwest. He's a primary point of contact -- you'll notice the address -- for sending your comments to. His name is the one on it. All right. So he's that primary point of contact.

Let's go over tonight's agenda. Hopefully, you've had -- most of you, I believe, had the opportunity to talk to the many staffers at all the poster stations and got as many of your questions answered as possible tonight. The primary purpose of this portion of the hearing is for the panel members to listen to your comments firsthand. They will not be answering questions during this phase of the proceedings.

Any comments and questions at this point will be addressed in the final EIS, which comes next. After I finish this introduction, Captain Lindsey is going to give a brief overview of the Navy's Silver Strand Training Complex and training activities. Next, Ms. Delphine Lee will brief you on the environmental impact analysis process and summarize the results reported in the draft EIS.

The last item on the agenda, however, is really the most important. The public comment session is your opportunity to provide information and make statements on the record. Your input ensures that the decision-makers can benefit from your knowledge of the local area and any environmental effects you think may result from the proposed action or alternatives.

To request an opportunity to make a verbal comment, we've asked as you came in the door -- hopefully everyone had the opportunity to fill out a comment card. If you haven't done that yet, let us know and just get one from the registration table. I have quite a few already, and I will be calling on people in the order in which they signed up to speak.

Every speaker, including public officials, organizational spokespersons and private individuals, will have three minutes each to provide his or her comments. However, if you don't feel comfortable standing up here tonight to make a statement, you may submit a written

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statement tonight. We also have the touchscreens where you can type in your comments.

You can also mail them in, or you can submit them online electronically as long as they are received or postmarked by March 9th. Written comments, keep in mind, are given the same weight and consideration as verbal comments here tonight. So it's just as good a way to comment as it is orally.

And now it is my pleasure to introduce Captain Lindsey.

CAPTAIN LINDSEY: Thanks, Lewis.

STAFF PRESENTATION

* * * * *

CAPTAIN LINDSEY: Good evening and welcome to the public hearings for the Silver Strand Training Complex draft EIS. My name is Captain Yancy Lindsey, and I'm the commanding officer of Naval Base Coronado.

I want to thank you on behalf of the United States Navy for attending this evening. This is one of two public hearings the Navy is holding in Southern California for the Silver Strand Training Complex draft EIS. For simplification, during the remainder of my presentation, I may refer to the Silver Strand Training Complex by its acronym, SSTC or "stick," is one of the words we use to -- I

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think it will shorten down the number of times I -- my presentation if I can refer to it as "stick."

Okay. The Navy has been training at the Silver Strand Training Complex for over 60 years. It is comprised of the Silver Strand Training Complex, north, this area, and the Silver Strand Training Complex to the south. Training activities are conducted in the Pacific Ocean, San Diego Bay, on the beach and inland. Training is also conducted on the southern near-shore areas in the Naval Station North Island, this area here.

The North Island area is not technically part of the SSTC area but is included in this study because of similar types of training that are conducted there. Navy airfield operations at North Island and Imperial Beach are not of the scope or not part of the scope of this EIS. I just want to say that again: Airfield operations at North Island and at Imperial Beach, the outlying field in Imperial Beach are not part of the scope of this EIS.

The overall mission of the Silver Strand Training Complex is to support U.S. Navy and Marine Corps amphibious, special warfare and mine countermeasure and other near-shore training by providing local land, sea and airspace support services, equipment and supplies and training facilities that will help naval and Marine Corps forces achieve and maintain the highest levels of operational readiness.



There are a number of Navy commands that rely upon SSTC to conduct required training. These include the Navy SEALs, explosive ordnance disposal teams, assault craft units, beach master units, amphibious construction battalion, special boat units, Marine Corps small boat raid companies and coastal defense units.

SSTC is used to support the training of these commands and their personnel, who, for the most part, are stationed in the San Diego metropolitan area. The Navy also conducts basic new recruit training on SSTC. This training is conducted in formal courses with syllabi and instructors, including both classroom and field work. For example, all SEAL recruits must complete the basic underwater demolition training program on the Silver Strand Training Complex to be qualified as a Navy SEAL.

There are over 70 different types of training activities that occur at the SSTC. One of the most common activities is basic physical fitness, that is, running, exercising, swimming, those types of things. Personnel may also learn how to operate different small Navy vessels and maneuver them across calm water or more challenging surf conditions.

Advanced students learn how to collect intelligence through reconnaissance, beach raids and assault coordination. Personnel also learn to seek, find and identify simulated mines to include dismantling and neutralizing them.

There is also logistics-related training. Personnel work together to move equipment, vehicles and supplies from a large offshore ship to onshore areas. This may involve shuttling craft and people between the ship and the shore and/or reeling out hoses to transfer fluids from ship to shore.

The Silver Strand Training Complex has a unique combination of attributes that make it an ideal venue to train servicemen and women in amphibious warfare, special warfare and mine warfare operations. SSTC contains large stretches of water, beach and inland areas.

Access to both the calm bay and rough ocean allow personnel to initiate training in a calmer environment and then quickly and easily transition to a more challenging environment on the ocean side as they improve their skills and fitness levels.

Southern California's temperate climate also allows for year-round training. The SSTC is also centrally located within our nation's largest concentration of naval forces. Its close proximity to necessary infrastructure, logistics, personnel and other complimentary training ranges makes it a critical training range for a wide range of military commands. This allows our servicemen and women stationed in the San Diego area to fulfill their daily training

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requirements without having to travel away from home.

In other words, the ranges are close to home so they can do realistic, quality training and sleep in their bed that night, a luxury that not many military folks are able to take advantage of with the increased deployment schedules that we've been experiencing.

To accomplish our mission in Southern California, it is critical for the Navy to maintain and operate these training areas so that naval forces and other military services can train realistically. Realistic training is critical for military readiness and is the single greatest asset the military has in preparing and protecting American servicemen and women to defend our nation.

There is no such thing as routine training when it comes to practicing combat skills. The first training opportunities ensure Navy personnel are able to react swiftly and decisively in a wide range of potential situations. Ensuring Navy forces are prepared for deployment requires training where military personnel can learn through practical hands-on experience the skills necessary to effectively plan and conduct operations.

Additionally, advancing technologies require more complex and varied training scenarios. The SSTC is unique and provides training opportunities essential for the safety and readiness of military personnel and the success of our

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Navy's mission.

While fulfilling our mission to train sailors, protecting the environment is a priority for the Navy. The Navy is committed to complying with its legal responsibilities for protecting the physical and natural environment and has established a successful track record of environmental stewardship while meeting our mission.

To accomplish its environmental stewardship goals, the Navy implements protective measures on land and in the water to reduce potential effects on the terrestrial and marine environment while ensuring public safety and accessibility.

I will now turn the presentation over to Ms. Delphine Lee from the United States Pacific Fleet, who will tell you about the Navy's proposed action and give you an overview of the draft EIS and the environmental analysis process.

MS. LEE: Thank you, Captain Lindsey.

My name is Delphine Lee, and I'm the project manager for the Silver Strand Training Complex environmental impact statement. I'm here tonight to give you an overview of the findings contained in the draft EIS. The draft EIS was prepared by the Navy to comply with the National Environmental Policy Act, or I'll be calling it NEPA.

It's an important part of the Navy's overall

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commitment to environmental stewardship as it trains. The Navy is the lead agency for this environmental impact statement, and the National Marine Fishery Service is a cooperating agency on this EIS in addition to their role as the regulator.

The Navy proposes to improve the availability and quality of training opportunities at the Silver Strand Training Complex to achieve the required levels of operational readiness as mandated under federal law. To meet training requirements, the Navy proposes to, one, continue current training activities, two, increase training frequencies and types of training, three, conduct existing routine training activities at additional locations within the established Silver Strand range.

And just to be clear, the Navy is not proposing to expand the training area, just where we train within the existing Silver Strand range.

Four, we're proposing to introduce new platform and equipment into training. And, five, we're proposing to increase the access and availability of existing beach and inland areas. The proposed action is needed to accommodate the future military readiness requirements, including increased usage of Silver Strand Training Complex, year-round access to training areas and flexibility in realistic training.

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Three alternatives were analyzed in the environmental impact statement to help determine the appropriate levels and types of training activities required for the Navy to meet its needs.

Under the no action alternative, the Navy would continue training as it has historically at the Silver Strand Training Complex. Training would not be different from what you've seen over the past five to ten years. This alternative provides a baseline for assessing the potential environmental impacts of other alternatives.

Alternative 1 is designed to meet the Navy and Department of Defense's current and near-term training requirements, and it is the Navy's preferred alternative. Specifically, Alternative 1 proposes to increase the frequency of training from roughly 4,000 activities to over 5,000 activities annually.

Two, we're proposing to increase -- introduce new types of mine countermeasure, amphibious and special warfare training activities. Three, we're proposing to conduct existing routine training at additional locations within the Silver Strand Training Complex to improve the diversity of training.

Four, we're proposing to increase -- excuse me -- introduce new platforms and equipment and to train specifically the MH-60S helicopter. We're going to replace

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the amphibious assault tracked vehicle with an expeditionary assault vehicle and upgrade the existing ship-to-shore fluid transfer system.

And lastly, Alternative 1 proposes to additionally increase the availability and accessibility of beach and inland training areas to accommodate the proposed increase in training activities. Alternative 1 is the Navy's preferred alternative because it would fully support the types and frequency of activities required to achieve complete fleet readiness training -- readiness and allow the Navy to carry out its mission at the Silver Strand Training Complex.

Alternative 2 is also designed to meet current and near-term training requirements. This alternative includes the proposals identified under Alternative 1. Unlike Alternative 1, it would also allow year-round access to all 7,000 yards of ocean-side beaches along the Silver Strand Training Complex, north and south, for continuous year-round training. California Least Tern nesting habitat at delta north and south would continue to be preserved.

In preparing the draft EIS, the Navy evaluated the potential effects of the alternatives on the marine, natural and human environment. The Navy took a comprehensive approach in assessing the potential environmental effects on 16 different physical, biological and socioeconomic resource areas. We will present some of these findings here.

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We encourage you, if you haven't already, to review the draft environmental impact statement, which presents the findings of the Navy's environmental analysis for each of these resource areas. We welcome your comments on the findings or the methods of the analysis.

For most of the resources analyzed in the draft EIS, we found no significant impact or long-term effects from the Navy's proposed action. Training at Silver Strand Training Complex creates intermittent short-term noise from various sources such as aircraft, vessels and vehicles. Although these training activities could be audible, they would not contribute substantially to the overall average sound levels of the area.

Increased training activities would increase the tempo of intermittent short-term noise. The Navy has established protective measures to reduce the effects of noise in the surrounding community. It works to minimize noise by considering the location and the time of day of the training activities.

The use of training materials may deposit small amounts of material on land and underwater training areas. Deposited materials are collected whenever feasible. The training [sic] amounts are not expected to affect biological or physical resources.

Many sensitive species, including endangered or



threatened species, are found on or near the Silver Strand Training Complex. For many years, the Navy has taken proactive steps to protect the natural resources on its land. Threatened, endangered birds on the Silver Strand Training Complex include the California Least Tern, the western snowy plover and the light-footed clapper rail.

Training activities have the potential to impact the Least Tern and the snowy plover, both of which nest on the training beaches. Since the mid-1980s, the Navy has implemented a comprehensive and adaptive natural resource management program and spends over half a million dollars annually to maintain protection for these species.

Thanks to the program, we've seen a dramatic increase in Least Tern and western snowy plover nesting on the Silver Strand beaches. The nesting continues to expand even with the Navy training on the same beaches.

No significant impacts on sea turtles or marine mammals are expected from the proposed action. Various measures will help to protect these species during training. For instance, the Navy will monitor for these species and halt training as necessary to protect them from harm. Effects on other marine biological resources and terrestrial biological resources will be minimal, as they are temporary and localized.

Commercial fishing, sports fishing, diving, boating and other ocean recreational activities occur regularly within or near the Silver Strand Training Complex. The Navy understands the concerns the community may have regarding public access. Training activities will continue to be conducted in long-established military training areas. The training areas would not be expanded.

The public would continue to have access to public beach and water areas adjacent to active training. During some training activities, public access to the training site may be limited for public safety and security reasons.

Significant impacts to cultural resources, transportation and circulation and socioeconomics are not anticipated from the Navy's proposed action. The Navy must comply with numerous federal environmental laws, regulations and executive orders such as those that are listed here. To help ensure compliance with these environmental requirements, the Navy has worked with and will continue to work with a number of regulatory agencies, including the Fish and Wildlife Service, the California Coastal Commission and the Regional Water Quality Control Board.

At this time, the Navy has completed the first three steps of the NEPA process, and we are now in the phase of providing the draft EIS for public review. Let me review the progress so far.

The EIS was initiated on August 6th, 2001, and the

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Navy held two public scoping meetings to invite the public to provide input on the proposed action, the alternatives under consideration and the environmental resources and issues to be analyzed. Government agencies, organizations and the public were encouraged to submit comments throughout the public comment period.

The comments received were considered in the preparation of this draft EIS that we are discussing here tonight. We are now at the 45-day public document review period and at the public hearing. This phase is an essential part of the NEPA process because it allows the public, such as yourself, to review the document and comment on the NEPA process and the Navy's analysis of potential environmental effects.

We encourage you to provide your input today or by March 9th so that it can be considered for incorporation in the development of the final environmental impact statement. All comments will be considered.

The Navy is committed to keeping the community informed throughout the development of this EIS. These public hearings are just one opportunity to share information and, more importantly, encourage your feedback and comments.

I will now turn the presentation back to Lewis to describe how to obtain more information and how to comment on the draft EIS.

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MR. MICHAELSON: Thank you.

In addition to holding these public hearings, the Navy has established a website to make it easier for you to find and comment on the environmental document. The address is up here, but I don't expect anyone to write it down. It's on virtually everything we've handed out to you tonight. Just look for it. Okay?

The draft EIS will be posted -- is on the website, and fact sheets are there. Our intent is to post the video that you were able to see back there, as well as anything else we can think of, including we're actually videotaping this public hearing tonight. We're testing out some new technologies.

One of them was the touchscreens for information, also leaving comments, something new we're trying out. And this is something that we hope to also provide on the website to make it as easy as possible for people who are unable to attend to still see what happened and what were the comments and presentations at the public hearing.

So you may also review a hard copy of the draft EIS, however, by visiting the Coronado or Imperial Beach libraries. So if you prefer to do it that way, you can do it. And the addresses of these libraries are provided on the NEPA process handouts, which you received when you came in tonight.



Okay. So here's the part about making public comments. There are several ways for you to submit them. One of them is by handing them in tonight. One of them is by making them orally. You can also go on the website through March 9th and provide them electronically if you want more time to think about it and digest it. You have up until that time to do that as well. Comments -- let's see. All comments must be postmarked or received by March 9th.

We're now ready to begin the oral comment portion of the public hearing. If there is anyone who wishes to comment, hopefully you have already filled out one of these cards. If you haven't, she's holding them up back there. Just raise your hand, and she'll bring you one. You can fill it out, and I'll add it to the list. I'll be calling on people in the order in which they signed to speak.

To make sure that we get an accurate record of what you have to say, we do have a court reporter here. She's making a verbatim transcript of everything said during this portion of the hearing. So we have a few ground rules just to try and make sure that this process works effectively and we get your comments on the record.

I'm going to ask you, when I call your name, to come up to this microphone and speak slowly and clearly starting with your name and any organization that you represent. We do not need your address.

Second, each person is allotted three minutes to speak. If you've prepared a written statement, you can turn it in to the registration table or you may read it out loud if you can fit it within the three-minute time limit.

Please honor any requests that I make for you to stop speaking when you reach the three-minute time limit. In order to make that as easy for you to do as possible, when there's 30 seconds left in your three minutes, I will hold up this card. Okay. Pretty clear, right? And if you make it to three minutes, I'm going to hold up this one. And I think the meaning of that one is pretty clear, too. All right? So this should allow you to find a comfortable place to wrap up your comments.

And with that, we are ready to begin. I do want to mention -- I'll read several speakers ahead, because the way you're seated here, sometimes you got to crawl over somebody to get to the microphone. So I'm going to read several ahead so you know where you're going to come up in the rotation, so to speak.

So the first names that I have are: Jim Knox, Leon Campbell, Jeff Foster, Normandie Trovato-Wilson, Richard Barck and John Warner. So if you would please do us the honor of leading us off, Jim Knox. Would you step up here to the microphone, and again, all we need is your name and organization, if you want.

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PUBLIC COMMENTS

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MR. KNOX: No organization. My name is James Knox. I had submitted these already. I do have some things I'd like to read out loud. One is on .3.5.1.4.2 and .3.5.1.5.2, the Pacific Ocean, about contaminants, report states that most of the contamination of the area is caused by sewage from the river mouth and/or the South Bay ocean outfall.

Storm water runoff has a relatively minor influence on local water quality, which is Table 3.5-5 -- will increase training at the south complex, cause more contaminants to reach the ocean by storm water runoff. Rain events occur mainly in the winter when ocean currents in the area are from north to south. Were seasonal changes and ocean water movement taken into account when the finding of contaminants were formulated?

The next is 3.5.1.5.2., Pacific Ocean. I believe that the Silver Strand State Beach does have day and overnight use numbers that were not included in this report. I request in the conclusion that the information presented is not representative of the use of the municipal beach in Coronado. The report in other sections extrapolated information that was used for conclusions without complete numbers, and I believe you could have done it for that particular part of the report.

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The Navy recreational areas, Gator Beach, Fiddler's Cove and so on, I don't believe should be included as recreational opportunities. They have restricted access not open to the general public. So I think you should only include those that the general public could go to. I can't read it all because we have three minutes.

3.6.2.3.2 of .2, new training activities will increase helicopter use. That's the TRAP. It's N9 on Table 2.2. I must disagree with the conclusion the noise level will not change. Each flight is a separate event with individual consequences regarding sound. Weather, temperature, wind direction and pilot skill all contribute to each event.

Suggesting that the helicopters will always be in their assigned flight lanes without data is an assumption. The helicopters get out of their flight lanes many times. I've noticed this, and I think training people -- willing to tell you that. Training evolutions may have variations that are not foreseen. This fact needs to be taken into consideration when making conclusions.

More use equals more sound in the adjacent residential areas. Citing the ambient sound of the surf supplies no useful data without knowing the size of the surf, the direction of the swell, the direction of strength of wind and the tidal level. None of this information is contained



in the table. Thank you.

Skip the other ones. Good.

I do have a mitigation area I think -- that I think would be nice, and that is to use the north gate if you have more than three vehicles coming to the south complex. Silver Strand is a small kind of windy-to-the-left street, and you will find that the traffic will back up pretty quickly, and they're going in and coming out.

Thanks for this opportunity and the assistance of forthright answers that were given to me to my questions and concerns in the open-house portion of this event. Thank you very much.

MR. MICHAELSON: Thank you very much. A model commenter, stuck right to the three minutes.

Okay. Next is Leon Campbell.

MR. CAMPBELL: Thank you. I represent the Airport Trust. It's a private trust. It has the proprietary interest as a licensee under a U.S. patent issued about a year ago, and briefly, it represents a new airport for San Diego. Not withstanding the fact we spent over 50 years and over $17 million trying to find an alternate site, this is an alternate site. It is feasible, and it will indeed work.

I've also met with the FAA in Washington, and they encouraged us to pursue the concept. And briefly, what it is is an airport that would be located within south San Diego Bay, and it would be analogous to an aircraft carrier. It would have a top level for aircraft operations and a lower level for parking, terminal, facilities, et cetera. It would even have an underwater tube for access to and from the shore.

The advantages from an environmental standpoint is that it observes water areas completely around it. It is not invading any habitats. It will not cause any excessive noise. The airplanes will be taking off over and across the bay. It does not interfere with air traffic, military or civilian, and basically we've had a lot of good feelings about what we're trying to do.

Tonight, I discovered that the airport, for its location, will be invading, if you will, part of the bay area for amphibious training for the so-called quiet-water training, and that would be the delta areas and the echo area.

Now, logically, we should find an alternate site for our airport so we're not interfering with that area. Unfortunately, there is no alternate site. We have the only site in San Diego County that's feasible. So we would respectfully ask that an alternate site be generated for at least part of your in-bay amphibious operations.

And I think, somehow, we kind of balance the

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interest so that that can happen. And otherwise, we are very much in favor of what's being done. We think that there's no environmental complex whatsoever between us. And as an incidental benefit, we'd like to create a second entrance to San Diego Bay so that the amphibious base can go ahead and get their vehicles or vessels out into the ocean and back very easily.

The airport does respect the amphibious security zones, so we're not involved there. And we're just down to an old-fashioned tradeoff where we think that the alternate site for the amphibious training in-bay, there is no alternate site for a new airport, which incidentally will be billions of dollars for the economy of the South Bay.

MR. MICHAELSON: Thank you.

The next speaker is Jeff Foster.

MR. FOSTER: I'm a resident of north IB, and so I think that this increase would affect us the most, living up in that area. The increase in activities of shotgun blasts from 150 to 1400, helo sorties from 778 to 2,220, I think. And I guess that, in general, it's a 48 percent increase in sound-generating activities. We definitely will notice that. A lot of them are at night, and it's -- we can hear it.

Let's see. I -- so I -- I just implore you to choose the no action alternative. I think that us residents of IB should be considered first and foremost in this

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decision, because I think we're going to be affected the most.

Also, we -- one of the -- one of the most coveted things about IB is the wildlife and the wildlife along the Silver Strand beach adjacent to the south training facility is -- it's really nice down there, and reading this, I can see there's a pretty good impact to that.

And I just ask that you choose the no action alternative. Thank you.

MR. MICHAELSON: The next speaker is Normandie Trovato-Wilson.

MS. TROVATO-WILSON: I'll move it back.

I'm Normandie Trovato-Wilson, and I'm here with San Diego Audubon. Some of the concerns Jim is going to be talking about in a little bit, my personal and biggest concern with the increased level of activities is the introduction of training within the vernal pool areas. These are highly sensitive, complex ecosystems, and I have no doubt about the Navy's commitment after speaking with Delphine last night about protecting the western snowy plovers, the Least Terns -- I'll get into that later.

But whereas the Navy can very easily barricade off an area around the western snowy plover nest, it's not quite so easy to determine what the impact is going to be once foot traffic is let into the vernal pool areas, and these are

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ecosystems of which 90 percent have been destroyed in California.

An alternative for the vernal pools, since the complex ecological effects seem to be unstudied and unpredictable, would be to maybe phase in some of the training around a vernal pool that is in poor condition and track what happens in that vernal pool. You may have unexpected results, and it may be better. It could be worse. We don't know.

The potential down-listing of the California Least Tern presents a very bad thing in terms of Audubon perspective. We don't really know what the cumulative impact is going to be on both the western snowy plover and the Least Terns. There don't seem to be a real quantification of the sets of numbers. We heard an estimated take number on the high side. We didn't hear one on the low side. There wasn't one in the middle either, and I find that a little concerning.

It seems that an option could be to slowly phase in some of these alternatives, such as phasing in the one lane for six months out of the year and seeing how that goes, et cetera. And I didn't see that as part of the plan. And I think that maybe phasing in some of the alternatives and studying the effects could provide the Navy with alternatives to mitigate what may or may not happen.

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Because as we've known from some of these, many, many, many of these experiments, what happens when we start dealing with these issues is very, very unpredictable. And that's all. Thank you.

MR. MICHAELSON: Thank you very much.

I'm ready to read ahead a few more speakers, so you can be prepared. Richard Barck is going to be next, followed by John Warner, Jim Peugh, Rina Kelley and Ed Sorrels.

Richard?

MR. BARK: She didn't adjust it for me, did she?

MR. MICHAELSON: You'll have to bring that up. Yeah, that needs some work. That ain't going to work. Can somebody help him with that? Thank you. There we go. Thank you.

MR. BARK: Richard Barck, and I guess my description would be local resident. I have a couple of thoughts here. And reading through the report -- a lot to read, a lot of work went into that -- some of the things that I would look at from a statistical standpoint are sound levels, which you always describe as average. I assume that means over a 24-hour period?

What we're mostly interested in when we live locally and especially at night is how loud it is for very brief periods. If you dampen it out over a day, yeah, it's not very loud, but it's very loud when it happens.

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For us, especially if we have any doors open facing west, helicopters go by. You cannot hear the TV. In the middle of the night, if you have a few sorties -- and a sortie, as I understand it, contains more than one helicopter in a formation -- they get very loud. They're only there for a few minutes, but if it wakes you up, you don't go back to sleep immediately.

And they happen throughout the night. My impression is that many of those flights can be more offshore, because I believe they're not attacking the shore or part of a mission. That would be a comment on that.

We have very quiet nights in this area. At night, we hear the surf. We like to hear the surf. We like to have the doors open to do that. We would not like to have to close them to shut out the noise. The second thing is that sometimes there's an offshore breeze. We hear the traffic on I-5 and the trains across the bay. It's quiet down here. We would like that to be maintained.

And basically, I am talking about the impact of your Lanes 11 through 14 or your white and purple. I don't know how you'd like to call them.

Secondly, been a big effort by local people, as well as Fish and Wildlife and the state parks, to further develop the snowy plover -- western snowy plover nesting areas. Some of those in Silver Strand State Beach south are

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immediately adjacent to all SSTC south.

As I looked at the maps, which are very large scale or small scale that you have on there, it actually appears that you've extended into what was part of Silver Strand State Beach for some of those zones. It is an area that we had good fledglings and nests actively occupied by snowy plovers. Department of Fish and Wildlife has the statistics, and I'm sure they will make it available to you.

MR. MICHAELSON: Thank you very much.

The next speaker is John Warner.

MR. WARNER: Yes, my name is John Warner. I'm a resident and a proud taxpayer.

Aside from these issues mentioned, I have two very serious concerns. For the first, I'd like to go back to December of 2008. There was an F18, left the carrier offshore, developed engine problems. He was instructed by commanders to bypass the open runway at North Island Naval Air Station. He was ordered to attempt a landing at Miramar Marine Air Station. We all know the catastrophe that ensued.

My point is that we need hyper-efficient communication, coordination and cooperation between the Navy and the Marines. Commander Perry in the paper today stated we need a very realistic training environment. That would be afforded by the vast wide open spaces in Camp Pendleton, not an area sandwiched between two civilian populations and youth

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camps.

Have I cut off?

MR. MICHAELSON: No.

MR. WARNER: My second major concern, anybody that's been in this area for a while knows that in the waters out here, we have viral. We have chemical. We have bacterial pollutants that contaminate this water for weeks on end. That's -- in an El Nino cycle, that's magnified.

Now that's not to mention the potential catastrophe if Rodriguez Dam fails. The structural integrity of Rodriguez Dam is at question. Built in the early '30s, it would not take much of a man-made or natural event. We've been having a little movement on the earth here recently. I guarantee you it wouldn't take much for Rodriguez to pop, the waters out here to be contaminated for months.

Now I've been told one SEAL team member, that's about $200,000 to train that man. That's quite an investment. That's quite a valuable asset. To put that valuable asset in an environment where he is exposed or she is exposed to hepatitis, waterborne pathogens, parasitic amoeba, that is unconscionable. It's negligent. It's reckless.

To expand -- yeah, give me the 30.

To expand this facility, it may be comfortable and convenient. You may be able to sleep in your beds at night,

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but I sincerely believe it's compromising the readiness of our troops. Pendleton, that vast area, would provide the opportunity. That's the resource that needs to be explored. Thank you.

MR. MICHAELSON: The next speaker is Jim Peugh. You don't have to adjust that. Just pull the mic down a little bit. There you go.

MR. PUGH: You probably should order speakers by height, and so we can gradually make it up or down.

I'm Jim Peugh. I'm the conservation chair of the San Diego -- is this working -- I'm the conservation chair of the San Diego Audubon Society. We appreciate the Navy's long-term work to protect the Least Terns and snowy plovers on the strand. And we understand, you know, the desire to have more training operations, but we think you can do it with considerably less impact to the environment.

And we'll mention a little bit -- our letter will try to be more specific, but it is interesting that you're working to increase the training capability where, just a few years ago, the Navy was looking to put a golf course on the same area, also in the city of Coronado, which seems ironic.

The Least Terns, you know, some of your data shows that the populations are really high. It is important to notice the complementary number, that the reproduction of -- the successful reproduction has been plummeting for the last

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few years. So Lest Terns are not the least bit, you know, in a good position for the future.

The purpose of the Endangered Species Act isn't to let species hang on for decade after decade. It's for recovery, and I hope that you'll orient, you know, your actions and your plan to enable the recovery of the Least Tern, and I don't think that the way it is set up it does now.

The project -- I understand that -- that -- figuring out what the -- the take impact is difficult, but it just seems like you need to have better quantification of what the take is. You run some models, apparently run worst-case models, and that's really misleading to the public and decision-makers when you're only saying this is the worst case when there's something significantly less than that.

You really need to say what the uncertainty intervals in the modeling is. You need to come up with a worst case, an expected value and a best case and -- so people at least know what -- you know, how precise your calculations are. And you don't have that.

And the same thing is true of your mitigation measures. The mitigation measures are really kind of fuzzy. They're not mitigation in the sense that I've ever seen before in any other project, and I've reviewed hundreds of EISs and EIRs.

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You need to be able to quantify what the benefit is going to be to the species, and you really need to show how the difference between the impact and the benefit is going to facilitate the recovery of the species, and I don't -- you know, to me, I don't think you've reached that level.

And then as Ms. Wilson mentioned, the services working on -- for some strange reason is working on down-listing the Least Tern, which seems to be the most inappropriate action I've ever heard of. But you need to look to see what the cumulative impact of down-listing will be with your project.

We're really concerned also with the vernal pools. I don't know if you ever had to do trail maintenance, but trails are an increasingly degrading thing. They just go deeper and deeper the more years it's used. I don't know what's going to happen to the contours of vernal pools, but I think that you need to take up a pool, as Ms. Wilson said, and do a lot of experiment over a lot of years before you actually start manipulating.

That's the most endangered habitat type in our entire region. And so I just hope that you'll work hard -- and another thing, too, is that the staff so far in their command has been very serious about the environment. But people change, and I want this project to be so they really will protect the environment, not just depending on the



personality of who's in charge. Thank you.

MR. MICHAELSON: Thank you.

The next speaker I'm going to read ahead is Rina Kelley -- and if I mispronounce anyone's name, I apologize -- Ed Sorrels, Van Collinsworth, RG Head and Cindy Buxton.

All right. Rina?

MS. KELLEY: Yes, hello. I'm an inhabitant of the north area of Imperial Beach. I am not a snowy plover --

MR. MICHAELSON: Could you state your name for us, please.

MS. KELLEY: Oh, Rina Kelley. I'm not a snowy plover or a fairy shrimp. However, I am an inhabitant. I don't feel also that you have mitigated enough sufficiently for me, being north of Imperial Beach, your mitigation of what you intend to do.

I would like to inform you at this time about your lack of attention and the dangerous disregard of your property in Imperial Beach that has put the inhabitants of my city into a dangerous, threatening activity -- subject -- being subjected to your dangerous, threatening activity for years.

I would like to put you on notice first that your steel wall outside the Camp Surf fence at the beach has huge holes, serves no purpose except to attract children, has become a serious hazard to the safety of us. Jagged, rusted steel rim and bottom are hazardous on a daily basis. It is an accident waiting to happen for children.

MR. MICHAELSON: Rina.

MS. KELLEY: Yes.

MR. MICHAELSON: You're going to have to slow down a little bit. I can tell the court reporter is not getting it. Sorry. Just a little bit. She's really good, but not that good.

MS. KELLEY: She can paraphrase it. This is not poetry. So -- thank you, though.

Anyway, okay. It's a hazard, anyway. And it's -- for about ten years, it's been a hazard there with holes, jagged. So would you have us wait another ten years to remediate and remove it? Hopefully not, that you are now formally put on legal notice with legal effect.

MR. MICHAELSON: Thank you.

MS. KELLEY: Camp Surf -- Camp Surf opened onto the street in a residential area for years. You did nothing about it. It ran over the animals on our street, one animal in particular. I called the Navy Chaplin, and the people were distraught. And hit a child in front of my home. It was not -- you did nothing. We are the ones that had to make that camp in the same manner that I just served you with a notice to move that gate to the other end.

I want to tell you that this EIS in and of itself

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is like the nose's camel -- the camel's nose in the tent's door. On SSTC northeast, you do a little bit more -- you could request more activity, permission for an EIS. Then you do it at NASNI. Then you do it in the south where the Navy SEALs are. It's an aggregate effect.

The aggregate effect is that, gentlemen, we live in a war zone. I live in a war zone in the summer where Navy SEALs shoot guns and explode munitions outside all night. I can't sleep. Could you please put a time limit on this activity. Your EIS specifically addresses the intensity, the intervals and another thing -- the intervals, the intensity of the activity.

We'd like to know the intervals. I'd like to have a -- you know, a timetable so that I can leave town. Also, in addition, the planes that NASNI fly overhead doing these endless, mindlessly seeming exercises -- I was an Air Force officer. I was on Air Force bases. I don't understand how the Navy can destroy a city like this.

You shouldn't even be here. This is property that is coveted south shore property in the south -- Southern California, and, you know, I really hope that you could provide us with some timetables at least in mitigation of this. And, you know, go to the Philippines. General MacArthur took care of the Japanese. You don't have to worry about them over there, unless you drive a Toyota. Thank you.

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MR. MICHAELSON: Our next speaker is Ed Sorrels.

MR. SORRELS: I can tell already I'm not going to be a happy speaker for you folks. The captain mentioned -- oh, my name is Ed Sorrels. I'm a Marine veteran. I've lived in Imperial Beach almost 40 years, two different places, one over on Hemlock next to the axillary landing field, and now I live on the north side of Imperial Beach.

I've heard floating airports. I've heard "I can't sleep at night." I've heard birds and vernal pools and one thing and another. The one thing I haven't heard addressed was, the captain, when he gave his introduction, talked about the importance of realistic training and surviving a combat situation. And there's nobody here yet in this whole group that has addressed the improvement of training, proportioned it to the survival abilities of a marine or a sailor in combat situations.

Now, I'm sorry you can't sleep at night. Neither can I. But damn it, that's the sound of freedom. And to -- I'm for option one. There's a sign down here at MCRD over the door of the drill instructor's training facility, and what that sign says is "Let no man's ghost say to me 'If only you had done your job,'" and that applies to all of us now.

And that's all I have to say.

MR. MICHAELSON: Thank you.

Our next speaker is RG Head. Oh, excuse me. I had



one stick to another one. It's Van Collinsworth. Sorry.

MR. COLLINSWORTH: Hi. I'm Van Collinsworth, and I'm the conservation -- actually vernal pool conservation director for a coalition of environmental groups. Those include the San Diego Chapter of Sierra Club, the San Diego Audubon Society, Center for Biological Diversity, the California Chaparral Institute, and I'm most known if it involves Santee. I actually live out in Santee.

The issue I wanted to most focus on is the vernal pool impacts. And, first, let me say I appreciate the fact you've already acknowledged there's not going to be any activity during the wet seasons. But I am still concerned that the impacts -- the foot traffic during the dry periods would result in mortality of endangered -- the endangered San Diego fairy shrimp.

So the best, I guess, opportunity or best route is actually to avoid those vernal pools possibly with some fencing or signage to identify the resource and so there aren't any impacts there whatsoever.

Now, the previous speaker made an excellent point about readiness and the importance of training, and we certainly appreciate that. And so if you were to find in your analysis that there couldn't be avoided -- even though we still feel that that foot traffic will create a significant impact, we'd like to see that mitigated elsewhere.

Now one of the things I have with me tonight is a map of vernal pools actually that are directly adjacent to Marine Corps Air Station Miramar on Bonita (phonetic) Ranch. That property is for sale. It has a wealth of vernal pool resources. It's a perfect candidate for the readiness and environmental protection initiative that the military has, the buffer program. So I would like to see that given some serious consideration in this EIS and see if that might actually meet the needs for mitigation.

Thank you very much. And if I could leave the map?

MR. MICHAELSON: Yes. Thank you.

Next is RG Head.

MR. HEAD: Good evening everyone. My name is RG Head, and I'm a resident of Coronado Cays. I've spent a lot of time in Imperial Beach. I have a Bachelor of Science degree in engineering and a Ph.D. in public policy. For the past 20 years, I've worked in the environmental planning industry, and now I'm a private citizen.

I've observed tonight's comments are mostly negative with the exception of Ed Sorrels', and I would like to add a few to provide some balance. First of all, naval training is critical. It's absolutely critical to our survival as a country just like it is for the Olympics.

In fact, the phases are very similar. Basic

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training is physical conditioning just like for a ski jumper. Pre-deployment training for combat is indispensable to train young men and women before they go to Iraq and Afghanistan. And thirdly, training between deployments is very important to get new technology, new ideas, constantly improved communications.

Secondly, training area environmental impact statements are very unique. Training areas, you can't move the area. The area is where it is. I think the 60-year experience of the Navy in this area states for itself that if the training could have been moved to Miramar or to Camp Pendleton, it would have been done so long ago.

I'll say something about the ease of which you throw off "use Camp Pendleton." Camp Pendleton's 17 miles of beach are so critically inhabited by endangered species, that less than five miles are available for continuous Marine Corps training. They're not going to walk them another 5,000 operations up there. There is no better place for this type of training in the bay and in the ocean than this location.

Thirdly, the constraints that are put upon the Navy and the Marine Corps in their training are already immense. Yes, there are environmental issues. Yes, there's public concern over noise and economic impact. But most of the -- some of the speakers that you have seen are single-issue advocates. They're worried about a vernal pool,

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or they're worried about the snowy plover.

The Navy does not have the luxury to be a single-issue advocate. It is like the rest of us. We are multi-facetted. We have to deal with all the issues at the same time and make tradeoffs. As the Supreme Court -- as the United States Supreme Court ruled in 2008 in "NRDC versus the U.S. Navy," we and the citizens must give adequate attention to the common defense, and that's what I see done in this EIS.

Training and environmental stewardship are compatible, and I believe the Navy has achieved a good balance in this set of analysis. Thank you very much.

MR. MICHAELSON: The last speaker for whom I have a card is Cindy Buxton. If there is anyone else that would like to speak, again, if you hold up your hand, someone will bring you a card, and we'll get you in. We want everyone to speak who wants to.

MS. BUXTON: Hi. My name is Cindy Buxton. Some of you know me from Mountains and Waterfalls. I've made some observations for stuff. I cannot know all of your point of view. I think that's obvious, so thank you very much for the Navy keeping the good communication over the years.

And with all due respect, and I most definitely do, I'm going to make a few observations from my point of view since I have a hard time seeing all of yours. The training

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has already been very, very effective, and I think we're all very grateful since World War II and Vietnam and Korea and Desert Storm.

So I look at the two miles up there as I drive to work every day, and I look at the half mile of particularly critical areas down here, and I go "Why do we really need this?" I don't -- I haven't yet really seen the compelling argument to do some of the things that they want to do.

And they talk about the criticality of training and the unique area that -- that area up in Coronado seems to me to be very similar as a beach to this one, the one difference being is that this beach has natural dunes, and it's one of the few places in Southern California where you have a long wide swept area of natural dunes.

I moved down here, believe it or not, to Silver Strand and to Imperial Beach specifically because that was such a gorgeous, gorgeous beach. And I certainly do think that we should share our beach where we can or they with us, as you guys are Navy.

This town has worked very hard, I've noticed. I thought it was pretty wonderful anyway, though they've worked very, very hard to improve it and improve property values, and I think a lot of heavy artillery will probably compromise that considerably.

The one thing I noticed in the EIS was that the

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camp, Camp Surf, apparently hosts 10,000 children in a year, and I don't think when they originally leased that that they were thinking of a lot of blasting. So what I saw in there was that the Navy holds that property in a fee simple, and I looked this up and noticed that fee simple can be fee differential or circumstantial subsequent, and I'm wondering if there are any extra contingencies on that.

The blasting does affect people and children. This is where my dog went through a window one night when she got scared, and I think children would, too. So I would ask you to consider that and modify and attenuate for the birds and the blasting in this area. Thank you.

MR. MICHAELSON: Thank you very much.

Do we have anymore cards that have been turned in? Corey, anybody?

Okay. What oftentimes happens at this point in the evening is that someone has gotten inspired by something someone else has said, so I want to make sure that before we adjourn here, is there anyone else here who wanted to take advantage of this opportunity to make an oral comment, whether they filled out a card or not? If not -- yes. Would you like to come up? Come on up. We'll just give you a card and have you fill it out afterwards. How's that?

MS. DAVIS: That's fine.

MR. MICHAELSON: All I need is your name.

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MS. DAVIS: I'm Shannon Davis, and what's on my mind is the fact this is an environmental impact statement. It's a draft. And we're focussing on the environmental issues and NEPA compliance. This is not about patriotism. This is not about being -- protecting our freedom. This is about saving endangered species on critical habitat that maybe apparently should have been paid more attention to by U.S. Fish and Wildlife.

And possibly some of these areas should have been sanctioned as refuge, study areas by U.S. Fish and Wildlife to be held under their jurisdiction, not in cooperation with the U.S. Navy.

MR. MICHAELSON: Thank you very much.

Anyone else? Sure. Come forward.

MR. FELTIS: My name is Edward Feltis, and I'm a resident of Imperial Beach. I've been coming down here since 1960 walking the strand, and this is a single -- single-cast issue. I'm not sure exactly how you put it, but single-person issue.

Upon reading the impact statement, I noticed that the tide flats are public, and I'm a pretty regular walker. My wife takes me down to Silver Strand. I walk up to the IB pier. I have no problems with -- and according to the statement, most of the training that's going to take place will take place for an hour or two hours, eight hours at the

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most, things will be posted. I have no problem with walking the beach, running up to a sign that says "Restricted area for the next 48 hours. We're going to be doing this. We're going to be doing that," turn around, walk right back to IB.

But my concern is that in 11 through 14, we'll get a sign put up like we had put up two years ago that said "Nobody past this point. This is naval property. You can't walk down to the Silver Strand," and what everybody did was ignore it. If they didn't see anything going on, they ignored it.

Readiness training, all part of that. I've got two kids that work -- or live down the hall from me that are in SEAL Team 3, and I want those guys ready, professional and able to do their job whatever it takes. I just want a little assurance that -- on those days when nothing's going on, I want to walk the Silver Strand between the state park and here -- I won't be in any kind of jeopardy or I won't be in the way of any activities. Thank you very much.

MR. MICHAELSON: Thank you. If we could get you to fill out a card, we'd appreciate it. Thank you.

Anyone else? See, I told you a few people would get inspired, didn't I? Anyone else?

If not, if you look behind you, you'll see all those eager faces at all those poster stations. They just can't wait for you to come back and ask them more questions.



And since we're here until 7:30, we're happy to do that.

So we're going to adjourn, and if anyone else wants to make oral comments, let me know and we have -- we can accommodate that.

All right. Yes, sir?

MR. SORRELS: I'd just like --

MR. MICHAELSON: Oh, you know what?

MR. SORRELS: Can you use my card again?

MR. MICHAELSON: For a second helping?

MR. SORRELS: Yeah.

MR. MICHAELSON: Let me confer. Yeah, sure. Go ahead. I'll give you another three.

MR. SORRELS: Okay. I won't --

MR. MICHAELSON: I don't think you used up your full three the first time.

MR. SORRELS: Okay. Summer of 1957, I was flown in from Hawaii to Camp Pendleton, and I worked all that summer as a lifeguard on the beaches there by Del Mar where they do the Amtrak and rubber boat training for the Marines. And I can assure you of one thing: The environment here on the strand is entirely different than the beach approach environment in Camp Pendleton.

You go from water to a very small beach, and then you start inland, and it goes uphill. You don't go from water to beach to water. And it is -- to compare the Silver

Strand to Camp Pendleton training areas is apples and oranges. The two don't compare at all.

MR. MICHAELSON: All right. Thank you.

All right. So we're going to be here until 7:30. We're going to adjourn and ask you to ask anymore clarifying questions that you want at the poster stations. Thank you very much.

(Hearing adjourned at 7:09 p.m.)

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STATE OF CALIFORNIA
COUNTY OF SAN DIEGO

I, Regina L. Garrison, a Certified Shorthand Reporter for the State of California, CSR No. 12921, do hereby certify: That the proceedings were taken before me at the time and place herein named; that the said proceedings were reported by me in shorthand and transcribed through computer-aided transcription, under my direction; and that the foregoing is a true record of the testimony elicited at said proceedings to the best of my ability.

I do further certify that I am a disinterested person and am in no way interested in the outcome of this action or connected with or related to any of the parties in this action or to their respective counsel.

In witness whereof, I have hereunto set my hand this ______ day of ______________________, 2010.

________________________________
REGINA L. GARRISON, CSR NO. 12921

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### E.3.1.2 Coronado

REPORTER'S TRANSCRIPT OF PUBLIC HEARING

RE: SILVER STRAND TRAINING COMPLEX

DRAFT ENVIRONMENTAL IMPACT STATEMENT

WEDNESDAY, FEBRUARY 24, 2010

CORONADO, CALIFORNIA

REPORTED BY REGINA L. GARRISON, CSR NO. 12921

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REPORTER'S TRANSCRIPT OF PUBLIC HEARING, commencing at the hour of 4:00 p.m., on Wednesday, February 24, 2010, at 1845 Strand Way, Coronado, California, before Regina L. Garrison, Certified Shorthand Reporter in and for the State of California.

I N D E X



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(4:32 P.M.)

ORAL COMMENTS

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ANONYMOUS SPEAKER: Basically, I understand that the Navy told me that the species are thriving where they're doing training. I think that's great. My concern is that a lot of environmental groups are not doing their homework and not paying attention to what the federal people are telling them.

For example, my son works for National Marine Fisheries, and the environmental groups don't read the reports that are coming out. They need to do their homework instead of filing lawsuits to stop everything. So maybe there's a middle ground here where everybody has to meet. You know, people have to pay attention to each other.

They're wasting taxpayers' money. We shouldn't have to take nine years to find something out and figure out a scope of work. We need to talk to each other and put aside our emotional differences. Amen.

* * * * *

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(6:03 P.M.)

WELCOME TO PUBLIC HEARING

* * * * *

MR. MICHAELSON: Good evening and thank you for coming tonight. My name is Lewis Michaelson, and I will be the moderator for tonight's hearing on the Navy's Silver Strand Training Complex environmental impact statement, or as you will hear it referred to for the rest of this evening, the draft EIS.

Here to receive your comments are Captain Yancy Lindsey, Commanding Officer at Naval Base Coronado, and then Delphine Lee, project manager for the Navy Pacific Fleet. Mr. Kent Randall -- I think I see him over there. He is raising his hand -- is the project coordinator for the Naval Facility Engineering Command, and his is the actual primary point of contact and address that you see on everything for mailing your comments to.

Let's look at the agenda for tonight. Hopefully you have all had the opportunity, or most of you did, to talk to the many knowledgeable experts who are at the poster stations during the open house. The primary purpose of this portion of the hearing is for the panel members to listen to your comments firsthand. They will not be answering questions during this phase of the proceedings.

Any comments and questions during this phase will

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be addressed in the final EIS. So in terms of the agenda, after I've finished this introduction, Captain Lindsey will give a brief overview of the Navy Silver Strand Training Complex and training activities. Then Ms. Delphine Lee will brief you on the environmental impact analysis process and summarize the results reported in the draft EIS.

The last item on the agenda, however, is really the most important. The public comment session is your opportunity to provide information and make statements for the record. Your input ensures the decision-makers can benefit from your knowledge of the local area and any environmental effects you think may result from the proposed action and its alternatives.

Keep in mind, the EIS process is intended to ensure the decision-makers will be fully informed about the potential environmental impacts associated with the various alternatives before they decide on a course of action. To request an opportunity to make a verbal comment during tonight's hearing, please fill out a speaker comment card. I have several filled out already. If you decide you want to speak after we've begun, just raise your hand, and someone will bring you a comment card from the registration table.

I call on people in the order in which they've signed up. Every speaker, including public officials, organizational spokespersons and individuals, will have three

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minutes each to provide his or her comments. If you do not feel comfortable standing up here tonight, there are several other ways you can make the statement.

We have touchscreen screens back there that you can use to enter your comments. You can hand in written comments here tonight. You can mail in written comments, or you can use the project website to provide written comments as well, as long as they're postmarked or received by March 9th.

I also have a court reporter here. She's here to make a verbatim transcript of any comments offered orally. Keep in mind, the written comments have the same consideration as verbal comments, so there's no obligation to speak verbally if you're more comfortable doing it in written form. Now it is my pleasure to introduce Captain Lindsey.

CAPTAIN LINDSEY: Make sure I get this figured out where you can actually hear me. Is the lighting on me when I stand back here better? I thought it might be, so I'm going to move this back. Is that better? Good. Make this command decision here. I'm just going to take this out. That way, I don't have to lean over.

MR. MICHAELSON: Are you sure, because I can get it down to your mouth if you want.

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STAFF PRESENTATION

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CAPTAIN LINDSEY: That's okay.

All right. Thank you, Lewis.

And welcome to the public hearings for the Silver Strand training draft -- or complex draft EIS. My name is Captain Lindsey, and I'm the commanding officer, Naval Base Coronado. I want to thank you on behalf of the United States Navy for attending this evening. This is one of two public hearings the Navy is holding in Southern California for the Silver Strand Training Complex draft EIS.

For simplification, during the remainder of my presentation, I may refer to the Silver Strand Training Complex by its acronym of SSTC or "stick." "Stick" is the common term we use when we're saying Silver Strand Training Complex. I think that will shorten my presentation if I can just say "stick."

The Navy has been training at the SSTC for over 60 years. The SSTC is comprised of the Silver Strand Training Complex north, which is this area here in gray and these lanes and the areas of the bay, blue, and the Silver Strand Training Complex to the south, which is this area here. Training activities are conducted in the Pacific Ocean, San Diego Bay, on the beach and inland. Training is also conducted on the southern near-shore areas of Naval Air

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Station North Island, which is this area here.

The North Island area is not technically part of the Silver Strand Training Complex but is included in this study because similar types of training are conducted there. Navy airfield operations at North Island and Imperial Beach, which is down about here, are not part of the scope of this draft EIS. And I want to repeat that. The airfield operations, that is the helicopters using the airfield or transiting between the air fields of North Island and Imperial Beach are not part of the scope of this EIS.

The overall mission of Silver Strand Training Complex is to support U.S. Navy and Marine Corps amphibious, special warfare, mine countermeasure and other near-shore training by providing local land, sea and airspace support services, equipment and supplies and training facilities that will help naval and Marine Corps forces achieve and maintain the highest levels of operational readiness.

There are a number of Navy commands that rely upon the SSTC to conduct required training. These include Navy SEALs, explosive ordnance disposal teams, assault craft unit, beach master unit and amphibious construction battalion, special boat units, Marine Corps small boat raid companies and coastal defense units.

The SSTC is used to support the training of these commands and their personnel, who, for the most part, are

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stationed in the San Diego metropolitan area. The Navy also conducts basic new recruit training on the SSTC. This training is conducted in formal courses with syllabi and instructors, including both classroom and fieldwork. For example, all SEAL recruits must complete the basic underwater demolition training program on the Silver Strand Training Complex to be qualified as a Navy SEAL.

There are over 70 different types of training activities that occur on the SSTC. One of the most common activities is the -- is basic physical fitness, that is, running, exercising and swimming. Personnel may also learn how to operate different small Navy vessels and maneuver them across calm water or more challenging surf conditions.

Advanced students learn how to collect intelligence through reconnaissance, beach raids and assault coordination. Personnel also learn to seek, find and identify simulated mines to include dismantling and neutralizing them. There are also logistics-related training. Personnel work together to move equipment, vehicles and supplies from a large offshore ship to onshore areas. This may involve shuttling craft and people between the ship and/or reeling out hoses to transfer fluids from ship to shore.

The Silver Strand Training Complex has a unique combination of attributes that make it an ideal venue to train servicemen and women in amphibious warfare, special



warfare and mine warfare operations. SSTC contains large stretches of water, beach and inland areas. Access to both the calm bay and rough ocean allow personnel to initiate training in a calmer environment, then quickly and easily transition into a more challenging environment on the ocean side as personnel improve their skills and fitness levels.

Southern California's temperate climate also allows for year-round training. The SSTC is also centrally located within our nation's largest concentration of naval forces. Its close proximity to necessary infrastructure, logistics, personnel and other complimentary training ranges makes it a critical training range for a wide range of military commands.

This allows our servicemen and women stationed in the San Diego area to fulfill their daily training requirements without having to travel away from home. And that's a significant aspect of the Silver Strand Training Complex, is that people can do a large majority of their training in -- literally in the backyard of where they're stationed so they can maximize the amount of nights they get to sleep at home. They can go to Jimmy's soccer tournament. They can go to Sally's play. They can go to PTA meetings because they can do high-quality, realistic training right here, and they're home that night sleeping in their bed.

And you can imagine with the amount of time that protecting the environment is a priority for the Navy. The Navy is committed to complying with its legal responsibilities for protecting the physical and natural environment and has established a successful track record of environmental stewardship while meeting our mission.

To accomplish its environmental stewardship goals, the Navy implements protective measures on land and in water to reduce the potential effects from the terrestrial and marine environment while ensuring public safety and accessibility.

I will now turn the presentation to Ms. Delphine Lee from the United States Pacific Fleet, who will tell you about the Navy's proposed action and give you an overview of the draft EIS and the environmental analysis process.

MS. LEE: Can you guys hear me? Okay. Great.

Thank you, Captain Lindsey.

My name is Delphine Lee, and I'm the project manager -- I'm the project manager for the Silver Strand Training Complex environmental impact statement. I'm here tonight to give you an overview of the findings contained in the environmental -- the draft EIS.

The draft EIS was prepared by the Navy to comply with the National Environmental Policy Act or NEPA. It is an important part of the Navy's overall commitment to environmental stewardship as it trains. The Navy is the lead



agency for this EIS. The National Marine Fishery Service is the cooperating agency on the EIS in addition to their role as a regulator.

The Navy proposes to improve the availability and quality of training opportunities at the Silver Strand Training Complex to achieve the required levels of operational readiness as mandated under federal law. To meet training requirements, the Navy proposes to, one, continue current training; two, increase training frequency and types of training; three, conduct existing routine training activities at additional locations within established training areas. And I want to be clear that the Navy is not proposing to expand the training area, just where we train within the existing range.

Four, we're proposing to introduce new platform and equipment into training and, five, introduce access -- excuse me -- increase access and availability of existing beach and inland training areas.

The proposed action is needed to accommodate the future military readiness requirements, including increased usage of the Silver Strand Training Complex, year-round access to training areas and flexibility and realistic training.

Three alternatives were evaluated in the draft EIS to help determine the appropriate level and type of training activities required for the Navy to meet its needs. Under the no action alternative, the Navy would continue to conduct training as it has historically at the Silver Strand Training Complex. Training would not be different from what you've seen over the last five to ten years. This alternative provides a baseline for assessing the potential environmental impacts of other alternatives.

Alternative 1 is designed to meet the Navy and Department of Defense's current and near-term training requirements and is the Navy's preferred alternative. Specifically, Alternative 1 proposes to, one, increase the frequency of training from about 4,000 activities to over 5,000 activities annually; two, it proposes to introduce new types of mine countermeasure, amphibious and special warfare training activities.

Three, we're proposing to conduct existing routine training at additional locations within the Silver Strand Training Complex to improve the diversity of training. Four, we're proposing to introduce new platforms and equipment into training, specifically the MH-60S helicopter. We're going to replace the amphibious assault track vehicle with an expeditionary assault vehicle and upgrade the existing ship-to-shore fluid transfer system.

And lastly, Alternative 1 proposes to conditionally increase the availability of beach and inland training areas

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to accommodate this proposed increase in training activities. Alternative 1 is the Navy's preferred alternative because it would fully support the types of training -- type and frequency of activities required to achieve complete fleet readiness and allow the Navy to carry out its mission at the Silver Strand Training Complex.

Alternative 2 is also designed to meet current and near-term training requirements. This alternative includes proposals identified under Alternative 1. Unlike Alternative 1, however, it would also allow for year-round access to all 7,000 yards of ocean-side beaches along the Silver Strand Training Complex, north and south, for continuous year-round training. California Least Tern nesting habitat at delta north and south would continue to be preserved.

In preparing the draft Environmental Impact Statement, the Navy evaluated potential effects of the alternatives on the marine, natural and human environment. The Navy took a comprehensive approach in assessing the potential effects on 16 different physical, biological and socioeconomic resource areas. We will present some of these findings here.

We encourage you, if you haven't already, to review the draft EIS, which presents the findings of the Navy's environmental analysis for each of these resource areas. We

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welcome your comments on the findings or the methods of analysis.

For the most part, the resources analyzed in the draft EIS, we found no significant impacts or long-term effects from the Navy's proposed action. Training at the Silver Strand Training Complex creates intermittent short-term noise from various sources such as aircraft, vessels and vehicles. Although these training activities could be audible, they would not contribute substantially to the overall average sound levels of the area. Increased training activities would increase the tempo of intermittent short-term noise.

The Navy has established protective measures to reduce the effects of noise on the surrounding community. It works to minimize noise by considering the location and time of day of training activities.

The use of training materials may deposit small amounts of material on land and underwater training areas. Deposited materials are collected wherever feasible. The trace amounts left are not expected to affect biological or physical resources.

Many sensitive species including endangered and threatened species are found on or near the Silver Strand Training Complex. For many years, the Navy has taken proactive steps to protect the natural resources on its land.

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Threatened and endangered birds on the Silver Strand Training Complex include the California Least Tern, the western snowy plover and the light-footed clapper rail. Training activities have the potential to impact the Least Tern and the snowy plover, both of which nest on training beaches.

Since the mid-1980s, the Navy has implemented a comprehensive and adaptive natural resource management program and spends over half a million dollars annually to maintain protection for these species. Thanks to this program, we've seen a dramatic increase in the Least Tern and western snowy plover nesting on the Silver Strand beaches.

The nesting continues to expand even with the Navy training on the same beaches. No significant impacts on sea turtles or marine mammals are expected from the proposed action. Various measures will help to protect these species during training. For instance, the Navy will monitor for these species and hold training as needed to protect them from harm. Effects on other marine biological resources and terrestrial biological resources will be minimal, as they are temporary and/or localized.

Commercial fishing, sports fishing, diving, boating and other ocean recreational activities occur regularly within or near the Silver Strand Training Complex. The Navy understands the concerns the community may have regarding public access. Training activities would continue to be

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conducted in long-established military training activities -- excuse me -- training areas. The training areas would not be expanded.

The public would continue to have access to the beach and water areas adjacent to active training. During some training activities, public access to the training site may be limited for public safety and security reasons.

Significant impacts to cultural resources, transportation circulation and socioeconomics are not anticipated from the Navy's proposed action. The Navy must comply with numerous federal environmental laws, regulations and executive orders such as those that are listed here. To help ensure compliance with these environmental requirements, the Navy has worked with and will continue to work closely with a number of regulatory agencies, including the U.S. Fish and Wildlife Service, the California Coastal Commission and the Regional Water Quality Control Board.

At this time, the Navy has completed the first three steps in the NEPA process, and we are now in the phase of providing the draft EIS for public review. Let me review the progress so far. The EIS was initiated on August 6th, 2001, and the Navy held two public scoping meetings to invite the public to provide input on the proposed action, the alternatives under consideration and the environmental resources and issues to be analyzed.

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Government agencies, organizations and the public were encouraged to submit comments throughout the public comment period. The comments received were considered in the preparation of the draft EIS that we have here tonight. We are now at the 45-day public document review period and at the public hearing. This phase is an essential part of the NEPA process because it allows the public to review the document and comment on the Navy's analysis and potential of environmental effects.

We encourage you to provide your input today or by March 9th so that it can be considered for incorporation in the development of the final EIS. All comments will be considered. The Navy is committed to keeping the community informed throughout the development of this EIS. These public hearings are just one opportunity to share information and, more importantly, to encourage your feedback and comments.

I will now turn the presentation back over to Lewis to describe how to obtain more information and how to comment on the draft EIS.

MR. MICHAELSON: Will you bring the lights back on? I had someone assigned to bring them down. I don't know where he went to bring them back up. Breanna, do you mind? No. She's got to go to the master. My light-turner left the room. Okay. Good. Thank you.

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In addition to holding these public hearings, the Navy has established a website to make it easy for you to find and comment on the environmental documents. The draft EIS, for example, is posted on the website. It also has additional background information and links to the fact sheets and posters that are available here tonight.

You may also review a hard copy, if you would like, of the draft EIS by visiting either the Coronado or Imperial Beach library. The addresses of these libraries are provided on the NEPA process handout you received tonight when you came in.

Thanks.

The Navy does, in fact, welcome your review and input on the analysis. I hope they've made that very clear to you both here and at the poster stations earlier this evening. And there are several ways for you to submit comments. Obviously, we're going to be accepting oral comments here shortly tonight after this presentation.

Written comments may also be submitted by filling out the comment form that you were handed when you came in. We have the table over there. You can also use the touchscreen to type them in if you would like to. There is also the -- as I pointed out, Kent Randall, the point of contact, this is the address. It's also on all the handouts. You don't have to copy it here.



So you can submit them in writing and mail them in using a postal -- you know, there's postal mail, or you can log onto the website and leave your comments electronically. Just keep in mind that March 9th is the deadline for postmarking or receiving those comments.

We'll now begin the oral comment session portion of the public hearing. If there is anyone who wishes to speak, we would ask you to fill out one of these cards. This is how we keep track of who is going to be speaking and what order they're going to do that. Is there anyone who hasn't yet signed up who would like to speak?

Actually, if you could just go pick those up for her, and hold up your hand if you would like to fill one of these out. Thank you. I want to make sure everyone who wants to speak gets an opportunity to do that. Thank you, Corey.

To ensure that we get an accurate -- here's some more pens if you would like.

To ensure that we get an accurate record of what you have to say, please help me, if you're going to speak tonight, by respecting the following ground rules: First, please speak clearly and slowly into the microphone over at the lectern there. We have a court reporter here, as I pointed out. She's going to be making a verbatim transcript, and we want to make sure we get an accurate record of what you have to say.

All we need is your name and any organization you represent. We don't need addresses. Second, each person will have three minutes to speak. Third, if you have a prepared written statement -- and you may turn it in at the registration table or you may read it out loud if you can do so within the three-minute time limit. Fourth, please honor any requests that I make for you to stop speaking when you've reached the three-minute time limit.

In order to make it easy for you to know when that is going to occur, I have this sign. It says "30 seconds." That means you have 30 seconds left of your three minutes. And if you manage to make it to the end of three minutes, I'll hold up this one. It says "end." And that way, you can wrap up your comments comfortably at the end of the three minutes.

With that -- let's see. I did want to mention that we are trying out some new technologies to involve people in the EIS. Some of you people may have used that touchscreen for either getting information or for leaving your comments.

We are also videotaping, trying to experiment with the ability to make copies of that and put that on the website as well so that people can see what happened at the hearing. So I just wanted you to be aware that we were doing that.

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So with that in mind, let me go ahead and read the speaker comment cards I have already to have some idea of where you're coming up in the rotation so you can be ready to come up to the microphone. The first speakers will be Bill Adams, followed by Jennifer Blair, Beverly Dyer, Normandie Trovato-Wilson, Gary Trump and Marilyn Field. So, again, if you would kick us off, Bill Adams. Thank you.

PUBLIC COMMENTS

* * * * *

MR. ADAMS: Yeah, my name is, of course, Bill Adams, and I'm primarily interested in -- I'm a shore fisherman. I've been shore fishing Coronado beaches since 1949. As a matter of fact, when I was ten years old -- my dad was in the Marine Corps -- I was fishing off the Coronado jetty in front of the hotel in 1943 at age ten. So I know a little bit about shore fishing.

Now I'm particularly interested in your Section 3.8, quote, fish. And I'm going to be talking mostly about what we shore fisherman use as bait. Those are called, especially in the summertime, sand crabs. That's the backbone of shore fishing in this area here. On your section references, you talk about -- you have 75 references on 15 -- 15 pages, I think it is.

I wrote reports for the Navy for over 30 years. So

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I was a little surprised when I opened up this document -- a young man earlier explained to me why you're not doing it, but usually when you have a reference, you would have -- if I went to the reference section, it would say in the report what page this came from, or pages. All right. That's not done.

It's almost impossible to go through that report and find out where you're talking about. For example, you've got one report dated 1892, some author who wrote something in 1892. I'd like to know what was so important that was required to be in the reference -- 75 references.

The other thing that many of us shore fishermen are concerned about, and both the lifeguards in Coronado are well aware of the situation, especially shore fishermen, and that is wheeled vehicles on the beaches. Okay? Now, years ago, when I was on the city council in Coronado, we managed to talk the Navy into getting off the wet part of the sand. That's where the sand crabs are at.

But I noticed just recently they're still driving those vehicles on the wet sand, especially at low tide. That's almost a no-no. You're killing the sand crabs.

Now, you say there's no long-term effect. Well, I can tell you, as a fisherman, there is. There are no sand crabs on Coronado beach right now. If I go down to Silver Strand, there are sand crabs. If I go down to Imperial Beach

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by the pier, there are sand crabs.

Oh, my God. I guess I'm going to be cut off real short here. Amazing. I don't see how you can have a real impact on a discussion when you only have three minutes. I mean, that's ridiculous. And then tell us, "Oh, by the way, we've got a thick document here," and you want us to respond by March 9th. That is ridiculous, too. And there's only one copy of that report in the Coronado library.

Yeah. Well, I've said my piece.

MR. MICHAELSON: Next speaker is Jennifer Blair.

Actually, the court reporter needs to be able to make an adjustment, if you don't mind. Ready?

Okay. Go ahead. Thank you. Just state your name.

MS. BLAIR: Jennifer Blair.

My question -- I noticed in the agencies that the California Environmental Quality Act really was not addressed in there, and my specific question is related to noise, and the helicopter noise is the main problem that I'm seeing. I live in the Cays, and I understand we're not talking about the helicopters that are going from -- transporting from Miramar and down to the south end in IB, but you're considering -- I forgot how many sorties that you want to have in addition of the helicopters, and how is that addressing the environmental noise act? That's just a question I have.

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MR. MICHAELSON: Okay. Thank you.

The next speaker is Beverly Dyer. Brandon, can you do me a favor and bring the microphone up a little bit? Thank you.

MS. DYER: I think it's ludicrous that the Navy has suddenly thrown this upon our public.

MR. MICHAELSON: Would you state your name, please.

MS. DYER: I want to know how long they have been studying this, why we haven't heard about it before. I know they've been saying they're going to get all this money, and they can do all these things, but did they ever tell any of us that they were going down the strand? None. I have never seen it released until last night, and I didn't have time to write up all of my questions that I have, all the comments that I have.

But I have been jotting down different things as you've gone along. But it just doesn't seem right that suddenly we know -- we read about it in the paper, and a lot of people didn't see it in the paper, and there has been very, very little about it on the television. Now that isn't fair. It isn't fair for the Navy to suddenly come in to say "We're doing all these things, and we've done all these things and we've looked up all the environmental necessities and for the project."

But why haven't we known? Why haven't they told us

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if we live here? I live in the Cays. I've lived there 40 years, and I've watched things. I haven't seen any kind of action in that area. In fact, at one time they were going to build a golf course up where you now have buildings on the hill. We used to walk there. There wasn't anything going on there. So -- and suddenly, you've done all these things. You're going to take it over, and there has been very little going on even north of the -- of Silver Strand park where people park right up -- up to the Navy property.

But I haven't seen actions going on that far down, and perhaps I missed a few, but I doubt it, because I drive there all the time. And that's another thing that you did not bring up, and that is traffic. The traffic has gotten absolutely horrible because of the Navy, because of North Island. They've been working on that tunnel for North Island, and that's ridiculous because we have -- already have all this traffic coming up from the -- the helicopter base down in Imperial Beach, coming up the strand. They're just continual already.

Now you want to do all these other things. You want to save the Navy from having to go far away from their homes. Well, what about the people that live here, that have -- live in Imperial Beach or live in the Cays or live in Coronado? You just add that much more to the people that are here. Even though you keep your people from driving, there

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are other people that live here, too, and the people that work for the Navy.

Thank you. I'm going to also include a letter, so -- later on. Also -- and I agree with the noise and the pollution, you have -- nothing has been said about the pollution in the air that we breathe from the planes going over anything that's on the beach that we get from any of their -- their vehicles and any of the pollution that's in the water. They have the Silver Strand beach there where public comes in and uses up all summer, even in the wintertime, and they use that beach as do the surfers. Thank you.

MR. MICHAELSON: Thank you. That was Beverly Dyer who just finished speaking.

Normandie Trovato-Wilson, please.

MS. TROVATO-WILSON: Hi. I'm Normandie Trovato-Wilson, and I'm with the San Diego Audubon. I want to thank Captain Lindsey and Delphine and Lewis for hosting again tonight. I have just a few things that didn't come up last night.

The first thing was we know that there is anticipated projection in -- an increase in levels of recruitment, and we completely understand that with the level of new recruits that are needed to maintain the fleet readiness. However, if levels drop in the future, we would

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be interested in including a provision that indicates if for some reason there is complete peace everywhere on earth, for instance, and training levels dropped dramatically, that certain training lanes which are not currently used, if they are used in this future Alternative 1, that they might be phased back.

It was brought up last night about peak noise events and how peak noise events might be a helpful statistic to include in the second draft of the EIS as opposed to average noise levels, because if we're talking about peak noise, we can have one really loud peak noise, and then the rest of the day could be quiet, and that would be an average noise level, but that wouldn't analyze the data of the peak noise and how loud it would be.

The other thing that I want to repeat from last night is that the California Least Tern is currently in limbo of being down-listed by the U.S. Fish and Wildlife Service, and that would have a big effect on what would be going on at the SSTC. And just as a side, recovery efforts are often unpredictable and hard to predict what's going on. And there is a commitment, clear commitment by the Navy to maintain the environmental integrity of the SSTC.

And it's my personal opinion, not necessarily Audubon's, that maybe some phasing in could be added into the -- the use -- the plans, so maybe trying something, if

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you see a negative impact, phasing it out. I don't know exactly what the protocol is for that.

And it is our hope, from Audubon, that these steps are not towards general reduced protection of wildlife in general, but maintaining of the Navy's commitment to the environmental integrity of the SSTC. Thank you.

MR. MICHAELSON: Thanks.

Our next speaker is Gary Trump.

MR. TRUMP: My name is Gary Trump. I live in the Cays. Ma'am, sirs, thank you for having us. I was a little late, so I'm not so sure what's been covered, but my major question would be: Are you going to have an independent study to corroborate what your positions are? Because I think without that, nobody's going to believe you, at least the skeptics won't.

The other thing is, we live at the very bottom of the Cays. There's a lot of unburnt fuel from the helicopter passages. There is a lot, and it's all over the patio furniture. It's not thick, but it's there. And if you increase your level of helicopter flights, you're going to increase that, too.

The other thing is we sit out on the patio quite a bit, and there are times, with your helicopter noise, that we have to stop talking. And I'm quite sure that you don't really want to have that happen in this environment. It's a

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lovely environment.

We came from Los Angeles, and we've never known you people before. We live in the Cays, and there are a lot of people in the Navy there. We love you very much. We're worried about you, and yet I think there are some things about your proposition which probably is not -- I don't think withstand a peer review. So maybe you can think about that. Thank you so much.

MR. MICHAELSON: Thank you. I'm going to read ahead the next speakers so you can know where you're coming up. Marilyn Field -- and if I mispronounce names, I apologize in advance -- I believe this is Steve Cohan, followed by Ryan Short and Judy Haims.

MS. HAIMS: Good evening. I'm Marilyn Field. I'm a Coronado resident, and I'm very concerned about this project. I'm very concerned about the noise impacts and the pollution impacts. The newspaper said there was going to be live fire. I was told tonight there wasn't, but I think it would be good if we understood exactly what was going on.

As far as the noise impact, it simply defies credibility that there's going to be no significant increase in noise. It may -- you can do all kinds of things with statistics. You can average it out over a long period, and somebody said you could play all kinds of games with it, but it's simply not credible that this is not going to add to

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noise in Coronado.

This is a small residential community, and you just cannot keep using this as though this is your only training facility. You have other places where people can train. And, yes, it's more convenient here, but you have to balance that against the needs of the small community, and you are very definitely going to be impacting the quality of life here.

Already, we have serious impacts of helicopter noise. We live on the other side. We live on the San Diego Bay side, and yet we are constantly, in the summers particularly, affected by helicopter noise so that we can't watch the evening news. We can't have telephone conversations. We can't conduct conversations around the dinner table because the helicopters will come in fleets going south or north on the bay. And they're supposed to stay offshore, but they don't.

Now, I'm told that this project did not analyze the helicopters going to and from the training areas. Now that seems to me it's probably a violation of NEPA. Under the National Environmental Policy Act, you're supposed to consider all of the environmental impacts, whether they're remote or anything that's affected by this project.

You said you've been working on this since 2001, and yet you've chosen to analyze the helicopter traffic

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patterns and noise to and from the training area separately. Now that's called segmentation. It's illegal under NEPA. You're supposed to analyze the whole thing, and the public is supposed to have an opportunity to understand and comment on the total effects of the project, not chopped up into little pieces so that it looks benign, but the entire impact of the project. That needs to be done before you proceed here.

Secondly, I think the gentleman who just spoke made an excellent idea. I think we do need some independent analysis of your conclusions, because they're simply not credible. And I think it's important to consider the quality of life here and the human element, as well as the wildlife.

So I'd like you to think about what you're doing to Coronado. It's not just about the Navy. This is a small community, and we really need to be very aware that you cannot simply continue to load Navy operations here without ruining this small town. Thank you.

MR. MICHAELSON: The next speaker is Steve Cohan.

MR. COHAN: My name is Steve Cohan. I just wanted to make sort of a summary statement about my impression of the project. People have talked and brought up some very good points. The impression is that there's going to be a really significant change of impact on the beach. The fact that this process was started in 2001, that now you're -- it was ten years ago and you're now having public hearings, I

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think that the presentation has tended to minimize what the likelihood is of the impact, that it's going to be significant.

The people have mentioned these really important areas that really haven't been fully addressed, the impact on wildlife, the noise impact, the possibility of future cutbacks of these operations, legal compliance with preparation of the report.

All of these things can't be dealt with, of course, in three minutes, and I'm not prepared to make any technical statement about it, but I think you should take into consideration that the impression of the community is -- is that this is going to be a significant degradation of what is a very beautiful beach, very unusual beach condition in Southern California.

There aren't many white-sand beaches that are left that are in the quality condition that it's in. I would just make one further statement that this isn't entirely a problem that I would attribute to the Navy. Having lived around the Navy and watched its operations, including the helicopter operations, the Navy's done a good job, I think, of trying to concern itself with public impact. This isn't entirely the Navy's doing.

It has to do, perhaps, with what really is a long-term problem of our poor political leadership out of

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Washington. Nevertheless, it looks like a very significant degradation of the community. Thank you.

MR. MICHAELSON: The next speaker is Ron Short.

MR. SHORT: Hi. My name is Ron Short, and I live in Imperial Beach about a block south of Camp Surf, which is the southern border of your training complex. My concerns are basically the -- sort of like the infringement on our quality of life down there. One is noise. You know, my wife and I were awakened in the middle of the night by live machine gunfire, and I suspect this sort of activity will continue to go on.

I would appreciate a heads-up if that's going to be the case. At least we know what to expect. I know when they filmed Transformers II at that complex, they gave everybody in the community some heads-up, so we knew the pyrotechnics and stuff like that was coming.

Another concern is the -- perhaps the increase in traffic on Silver Strand Boulevard going to the gate there at the southern end of the complex. You know, I would be -- I would like to know if you anticipate an increase in traffic, because that would also impact the quality of life down there. Thank you.

MR. MICHAELSON: The next speaker is Judy Haims.

MS. HAIMS: My name is Judy Haims, and I live at the Cays. I agree with the noise. That is a tremendous

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issue. You have no idea how much noise is generated down there. I've been there for 18 years. You -- the paper says that you have like 150 -- 150 sessions, and they're going to go up to 700-and-something. That's not a small increase.

And they talk about the decibel level. It's ingenuous to say the decibel level may stay the same. It may stay the same, but the amount and time and duration for the extra 550 sorties that you're going to have is tremendous, and that needs to be addressed.

And also, the strand -- the Silver Strand is used tremendously all year long by campers. It's going to affect these people who don't have the opportunity that we do to live in Coronado. And this has just been too fast and too soon. You may have known about it, but the people who live here and enjoy this way of life are not aware or have not been until now.

MR. MICHAELSON: That exhausts the list of speaker cards that I have. However, as is often the case, something that someone else has already said may have inspired you to want to also offer comments. Is there anyone else here in the audience who would like to?

Go ahead and just come up to the microphone, and we'll get you to fill out a card afterwards. And use your name for now.

MS. DAVIS: I'm Shannon Davis. I live in Imperial

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Beach. One issue that has not been addressed on the south end of the project at Radio Receiving Facility is ambient lighting. I have driven down the strand in the middle of the night and seen lights on that were way too bright, and I have concern for the endangered species there and how that ambient lighting would affect the birds.

And I'm also very concerned about the fact that you mentioned that you may want to take 200 men in a year's time of foot traffic through the vernal pools when they're dry. And you must understand that that is a very delicate ecotone. Some of it -- some of the vernal pools took thousands of years to come into the making, and there are sediments there that can be irrevocably destroyed.

The eggs, though they are dormant and dry, come alive when the rain season comes. But they can be there for years without any activity there. And I'm concerned as to why you wouldn't fence those vernal pools and keep them in and the foot traffic out of there. So that's very much a concern.

Also, I would have liked to have seen some studies included from U.S. Fish and Wildlife and from your biologist on the populations of the San Diego fairy shrimp. I would like to see if there are any other species in the vernal pools, if there is any possible genetic corruption from another species there.

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There was a study done by a Dr. Marie Sinedich S-i-n-e-d-i-c-h. She got her doctorate. In 2004, she did a study in all the vernal pools here in San Diego County, and she did it in cooperation with U.S. Fish and Wildlife, and the vernal pools at the Radio Receiving Facility were not included. And I -- my question is: Did the Navy not cooperate in those studies, and why wasn't that included in that inventory and in that study?

And also, I would like to alert you to the fact that there is a steady decline in the endangered fairy shrimp and that they could go extinct if you have foot traffic in there. You could do irrevocable damage.

MR. MICHAELSON: Thank you.

Corey, if we could get her a card to fill out, I would appreciate that.

Is there anyone else who has not yet had the chance to speak this evening? Yes. Go ahead.

MS. LAMBERT: Good evening. I'm Vicki Lambert, and I'm a resident here in Coronado. We've talked a little bit about traffic mainly on the strand, but I live here in the village. And I can only see -- or foresee that traffic across the bridge and down Orange on 75 is going to increase with the number of people that are going to come from their homes in the San Diego area to do their training here. And I don't know if that has actually been -- that level of

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increase has been taken into account in the city planning.

And with the tunnel discussions that we've been having, we need to also look at how we would deal with that increase along with our new carriers coming in. So thank you.

MR. MICHAELSON: Thank you. See, there were more of you that wanted to say something. Anyone else who would like to add their thoughts to this?

Can I just make sure everyone's had a first chance first? Anyone else? We did last night run by the same rules, and we did provide the opportunity for what I like to refer to as "second helpings," so if you would like to do that, please do. All I need is your name again.

MS. HAIMS: My name is Judy Haims.

Let me ask you this: What other sites could you use, and have you thought of other sites to use? Has there been a choice, or you just haven't told us that there was choices? And the thing that comes to my mind is what about using Camp Pendleton or renting the area from Pendleton or doing some kind of a swap or something, because you're going to have your beaches, you're going to have your landings, and you don't have the city with the quality of Coronado right in the middle of Pendleton.

MR. MICHAELSON: Just to be clear, we don't answer questions, so we'll take that as a comment. It will be

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looked at in the final EIS.

MS. HAIMS: Okay.

MR. MICHAELSON: Okay. Thank you.

Anyone else who didn't have a chance to speak? Because if not, we are here until 7:30 and -- just as we did last night. We adjourned, and we had our poster staff go back and continue to provide information and answer questions. So if there is no one else who would like to speak, we are adjourned, and we'll be here until 7:30.

Thank you.

(Hearing adjourned at 6:57 p.m.)

# Appendix F
# Response to Comments

# APPENDIX F

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# F RESPONSE TO COMMENTS

The Navy received public comments on the Silver Strand Training Complex (SSTC) Draft Environmental Impact Statement (EIS) via four sources: written comments, information station comments, website comments, and oral comments. Regardless of the source, all comments have been treated equally. The comments were submitted during the public comment period (January 22, 2010 through March 9, 2010) and during the public comment period extension for the document (March 9, 2010 through March 30, 2010).

Comments were received primarily through the mail, website, or at the public hearings. Written comments were submitted to the Navy via the mail. Website comments were submitted to the Navy via the project website. Oral comments were taken directly from the official transcripts prepared by a court reporter. The comments have been reproduced as accurately as possible. In some cases, the editors may have made minor errors in the translation of some handwritten letters. For this reason, a copy of each comment has been placed in Appendix E. Private individuals are presented first, and are sorted alphabetically. Comments submitted by organizations are then presented, also in alphabetic order. Appendix E also contains the official transcripts of the oral comments made at the public hearings.

In preparing the Draft EIS each resource section was prepared and reviewed by numerous qualified individuals, to ensure that the proposed activities and issues received a rigorous and thorough assessment. The best available scientific data and the latest peer-reviewed studies were considered.

In this Final EIS, the Navy has made changes to the Draft EIS, based on comments received during the public comment period. These changes included factual corrections, additions to existing information, and improvements or modifications to the analyses in the Draft EIS. This section presents the public comments received and the Navy's responses to these comments. The public should note that these changes are non-substantive and do not result in any substantial modifications to the proposed action, the alternatives considered, the affected environment, or the environmental effects analyses of the Draft EIS.

Although all comments have been read and considered, some comments were not specific regarding the analyses or the alternatives in the Draft EIS and, therefore, could not be given specific responses and are not reproduced in this Appendix. As stated in the Council on Environmental Quality's (CEQ) Regulations for Implementing the National Environmental Policy Act (NEPA), 40 CFR Part 1503.3(a), "Comments on an environmental impact statement or on a proposed action shall be as specific as possible and may address either the adequacy of the statement or the merits of the alternatives discussed or both."

To allow side-by-side review of the comments and the Navy responses, all comments have been transcribed and entered into a table format that follows in this Appendix, with the comment in one column and the Navy's response in the next column. Comments are presented in the same order in Appendix E as they are in this Appendix.

| # | Name or Organization | Comment | Response |
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| **F.1 COMMENTS FROM PRIVATE INDIVIDUALS** | | | |
| 1. | William J. Adams | This letter is in regard to the Silver Strand Training Complex draft EIS, dated January, 2010. The comments are in reference to Section 3.8 Fish, specifically in regards to SAND CRABS along the Silver Strand beach and Coronado beach.<br><br>For those who do not know what sand crabs are, they are the primary food for fish, sharks, rays, birds and specifically Corbina (during the summer months). The Corbina is a primary fish that surf fisherman are after during the summer. However, during a GRUNION run, they are the primary food for large Corbina and Halibut. FACT: Over the last six or seven years the population of sand crabs has dropped to almost zero. Any surf fisherman can tell you that. Of course, there are lots of theories of what has caused this. Some people believe it is because of the raking of the sea weed off the beach, etc. But the Navy does not do this along their beach and still there are no sand crabs.<br><br>The primary question that should be answered is why there are sand crabs at Imperial Beach, Mission Beach, Carlsbad and Huntington Beach. I believe that one of the major problems is the fuel emissions from the boats, etc., along the Silver Strand beach is the cause of the problem. What I am asking for is the following:<br>(1) Delay for at least 60 days before this report is final so that other fishermen can comment on this draft.<br>(2) The City of Coronado updates its water pollution equipment to measure the fuel emissions along Coronado beach.<br>(3) Have an independent, scientific statistical study (at some level of confidence) to find out what happened to the sand crabs along Coronado beach. Maybe SDSU, SDU, or UCSD could perform this study with the funds being provided by the Federal Government.<br>(4) Until this study is completed, stick with ALTERNATIVE I, NO ACTION ALTERNATIVE. | The Navy appreciates the public's involvement in the NEPA process. In response to requests by the cities of Imperial Beach and Coronado and citizens, the public and agency response period for the FEIS was extended to March 30th.<br><br>The City of San Diego Metropolitan Wastewater Department has monitored water quality offshore of Silver Strand since 1999 under the City's South Bay Ocean Outfall, located south of the Tijuana River estuary on the U.S-Mexico border. Ocean water quality monitoring by the City over the last three to five years provides a good understanding of typical water quality conditions in the area of potential effect. Local ocean water quality is generally good, with episodes of poor water quality associated with heavy storm runoff and sewage spills. As indicated in Section 3.5.2.3 of the FEIS, minor quantities of petroleum products, including fuel, oil, hydraulic fluids, and lubricants, may enter San Diego Bay and ocean waters during routine transits of Navy vessels and equipment conducting training activities. However, the small quantities of these substances released into the environment are not anticipated to affect water quality or marine invertebrates.<br><br>The Pacific sand crab (*Emerita analoga*) is usually abundant, burrowed in the sand between tide marks on surf-swept beaches from Kodiak Island, Alaska to Bahia Magdalena, Mexico (Morris et al 1980). Pacific sand crabs are not currently listed as a sensitive species, and are extremely widespread, abundant, and seasonally variable. Factors such as regional oceanographic dynamics, variations in longshore transport, and local circulation patterns that determine sediment grain size and food supply (they are filter feeders) are what is likely regulating sand crab populations along SSTC beaches. |

| # | Name or Organization | Comment | Response |
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| 2. | William J. Adams | Thank you very much for extending the comments (to the Draft EIS) until late March. This letter expands on my comments to you dated March 5, 2010 on Section 3.8 Fish.<br>Since then, some fishermen and others have asked me to add the following comments: (1) Sand crabs feed on tiny "plankton".<br>(2) A female may produce thousands of eggs. She carries them until the eggs hatch. For two to four months, the "larvae" drift as "plankton". What I believe is that these and other types of "plankton" are being killed by fuel emissions from the boats, etc. Along the Silver Strand Training Complex, since the Navy has expanded the use of the beach over the last six to seven years, the water has become more polluted from the fuel emissions.<br>What I am asking for is that until some studies are conducted to determine what has happened to the sand crabs, the Navy go with the "NO ACTION ALTERNATIVE". | The sand crab (*Emerita analoga*) has a long planktonic larval phase that implies a high dispersal potential, and coastal water transport is an important factor in determining its local and latitudinal distribution. An extended larval period allows individuals to colonize new areas with suitable habitats, and is a mechanism for annually restocking pre-existing populations (Tam et al., 1996). Factors such as regional oceanographic dynamics, variations in longshore transport, and local circulation patterns that determine sediment grain size and food supply (they are filter feeders) are what is likely regulating sand crab populations along SSTC beaches rather than fuel emissions, which was analyzed in Section 3.5.2.3 of the FEIS. The FEIS concluded that the minor amounts of fuel release during training activities would not affect the areas water quality. |
| 3. | Barbara Angioletti | As a resident of Coronado for 15 years I have witnessed the increase of military training & understand the importance of this to protect our country. I have read the proposal in re to the increase of training & in my opinion the increase is tremendous!!! Yes, you need more training but you also have to consider the area that this is in. We want our children to have the best & not hear the helicopters, etc. all day long. The military housing is in this area & the families there will have to live with these noises. I do believe you have to increase the training but not to the extent that you are proposing. | The Navy recognizes its proximity to adjacent communities, and has attempted to structure its training activities to achieve operational readiness while minimizing potential impacts on the surrounding area. The Navy considered time and location of training so as to avoid disturbing the local community, and does its best to conduct noise-producing activities during the day. To train in real-world scenarios that may occur overseas, however, Navy personnel must train at various times of day, and in varying terrain and conditions.<br><br>The typical flight pattern in support of SSTC-S inland training consists of an approach along the San Diego Bay flight corridor, turning west on the southern side on Emory Cove, and beginning a descent into SSTC-S, targeting the drop zone to the west of Bunker 99 on the northern end of SSTC-S. Once established in this approach, the helicopters remain at 500 feet over residential neighborhoods and do not reduce their elevation to 150 feet until they are over SSTC-S. On departure, the helicopters ascend to the west over the Pacific Ocean. |

| # | Name or Organization | Comment | Response |
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| | | | As described in Section 3.6.1 of the FEIS (Affected Environment), a substantial amount of daytime and nighttime helicopter activity occurs in the vicinity of SSTC that is not associated with SSTC training activities. Nighttime helicopter transits from NOLF and NASNI, as well as to and from SSTC-S, occur only over water. The only nighttime helicopter overflights of residential areas are Department of Homeland Security or U.S. Coast Guard. Information on these flight patterns, as well as the percentage of sorties associated with training at SSTC, has been added to Sections 2 and 3.6 (Acoustic Environment) of the SSTC FEIS. |
| 4. | Virginia Aspe Armella and Eduardo Cortina | I am a resident of Coronado and I live in Coronado Shores, Cabrillo Building. I have learned that the Department of the Navy is planning on increasing the levels of training at the Silver Strand Training Center. Suggested comments: I would appreciate your cooperation and efforts to maintain the quiet enjoyment atmosphere of the Coronado Shores, Cays, and Village as it currently exists. | The Navy recognizes its proximity to adjacent communities, and has attempted to structure its training activities to achieve operational readiness while minimizing potential impacts to the surrounding area. As indicated in Section 3.6 of the FEIS, noise effects of Navy training activities at SSTC are managed via administrative controls (planning). Activity planning considers location (e.g., Breacher training is located in inland areas) and time of day. Call-outs during physical conditioning training are minimized at night and when in residential areas. The Navy notifies local emergency personnel prior to training exercises that include the use of pyrotechnics or blanks. Cumulative effects of noise are presented in Section 4.3.6 of the FEIS. |
| 5. | Andrew Bailey | Overall, after perusing the SSTC Draft EIS, I still want to be super-supportive of the Sailors and Marines (D of N) but have exceptions to some of the proposals and assumptions in the EIS. I realize that training these forces well will be good for the environment in the aspect that they will be able to wage war more efficiently. Still, we – they – are at war, and there will be "unavoidable adverse environmental effects." I was impressed and entertained by the EIS and support Alternative One but suggest more consideration in the following areas:<br>• Contingency plans for Alternative Two<br>• Public notice about public access to beaches<br>• Notice about nighttime activities<br>• Mitigation measures in land use and detonations<br>Please, send a strong message by making contingency plans to implement Alternative Two. D of N should be ready to go a level higher to achieve objectives, and still have best practices. I also encourage beach activities "not limited to any day of the year" (3.1.2.2.2). [Did a lawyer write | The Navy recognizes its proximity to adjacent communities, and has attempted to structure its training activities to achieve operational readiness while minimizing potential impacts to the surrounding area. As listed in NBCINST 3502-1, the Navy does notify local public safety agencies and city governments about specific upcoming hazardous or high-visibility night training events so that the local governments may disseminate the information to their communities. Because of this and similar comments, the Navy is evaluating the possibility of extending advanced notification to the adjacent neighborhoods of Imperial Beach and Coronado through contact with City |

| # | Name or Organization | Comment | Response |
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| | | that?] At the same time, D of N could keep us civilian-beach-patrons informed about open beach hours. Perhaps the EIS Website can be converted into a beach-recreation information platform, with the option to call the NBC switch board. This would count as a land-use mitigation (3.1.1.7). If you're having a party, you invite your neighbors….<br>Unfettered access to wet-sand areas on – say – four (4) daytime ultra-low tide events (-1.5' or more), and a couple daytime ultra-high tide events (6.5' or more) is fair quiet enjoyment. Concerted planning is already a protocol (5.15.3-4).<br>Occasional access to Breakers Beach up to Zuniga Point seems fair too. The SP, duty assignments, and service members with restriction can keep civilians below the high-tide line. Perhaps D of N, in all its magnanimity, could share a drinking fountain, or a toilet. Look at the NAS Miramar Air Show. | offices or the Naval Base Coronado website.<br><br>Public access to Breaker's Beach and Zuniga jetty is restricted for military security and public safety. Chapter 3.1, Land Use, presents information regarding land use, leased areas, and public access.<br><br>Regarding 'contingency plans' for Alternative 2, all three alternatives discussed in Sections 2.2, 2.3, and 2.4 of the FEIS have been considered. One alternative (Alternative 1, Preferred Alternative) will be selected for implementation in the Record of Decision. In the unlikely event that some future situation necessitates changes to the selected alternative, the Navy will examine those needs and, if necessary, take appropriate actions under NEPA, which may include supplementing the Final EIS. |
| 6. | Andrew Bailey | A staff member for this EIS, Alex, who like myself, enjoys beach running, did not know that we have access to most wet sand areas when there are no SSTC training activities. I carefully questioned another staff member about this (Bruce), but it seems contradicted by the EIS (3.1.2.2.2).<br>I wish the beach entrance between SSTC-N & Coronado Shores was better marked with a fair sign. I noticed that the SSTC-N lease extends only to the mean high tide line but shifts to "100 to 500 feet offshore." I can share the beach.<br>Coronado residents should have advance notice about night operations so they can have the option to spend the night elsewhere.<br>SSTC needs to have better communication with civilians and a website as a beach-recreation information platform could serve day-to-day needs.<br>Overall, the lands leased by the Dof N spend more time unused, than with activities. Mitigation like restoring beaches after activities is expected and training protocols help, but the fact is that activities will increase 20% - other mitigations should be considered to offset this increase.<br>I read that one mitigation measure is to manage predators. An extension would be to coerce other beach users to observe a higher level of stewardship. D of N with its unfathomable resources needs to outreach. SSTC spends most of its time as an absentee landowner.<br>Bruce, an EIS staffer, explained that dog owners lose their dogs in the training areas. Dogs (and cats) area a terror to wildlife, wreak habitat, and leave damaging feces. Off-the-leash dogs are a problem city-wide and on the beach.<br>One section mentioned "avoidance and minimization." I could see a special program with the Cays, educational signs, and volunteer enforcement. MAYBE Cesar Milan would lend a hand.<br>Other mitigation was dismissed in this EIS "alternative" (5.9.3). Third-party observers are a cultural norm in the United States today: some people would kill Flipper for a tuna sandwich! | The Navy recognizes its proximity to adjacent communities, and has attempted to structure its training activities to achieve operational readiness while minimizing potential impacts to the surrounding area. New signs were placed at SSTC-S in March 2009 clarifying public access for pedestrians travelling on the beach. As described in Section 3.1.1.5.1 of the FEIS, the wet sand areas at SSTC-S are available for public use when training is not occurring below the mean high tide line. However, the wet sand areas at SSTC-N are not available for public use; they are leased by the State of California to the Navy for its exclusive use. The Navy plans to improve signage on both SSTC-N and SSTC-S to inform the public on how to help protect sensitive species.<br><br>To further inform the public of training, the Navy has identified additional mitigation measures for alerting the adjacent communities about events which may be considered intrusive, and has posted signs and other controls on public access to the beaches. The Navy is coordinating with volunteer members of the public, the 'Plover Patrol', who are interested in helping manage public plover impacts. The public is not |

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| | | There's no excuse for not trying to manage it, especially considering the extremity of the action. I'd be pleased to say a little prayer for the fish: that they fatten the beachmaster. I can see Point Loma from my house, and my neighborhood's topography is in one of the charts. The Strand may be my home break.<br>I could write more. | permitted to allow dogs off-leash in the training areas primarily because of the risk to native species.<br><br>Regarding third party observers, the general public is restricted from participating in these training activities both for military security and for public safety. |
| 7. | Richard Barck | I have listed below a number of points related to Navy anticipated use of SSTC-S which cause me concern:<br>1) SSTC -S (see NRRF) - The Navy comments that SSTC has been established for over 60 years is disingenuous with regard to stating the local residential community around SSTC-S "should expect air and ground noise" in the proximity of the base. For residents building/purchasing homes in the SSTC-S/NRRF area, there was nothing more quiet than a radio receiving facility. SSTC-S was renamed from NRRF (Naval Radio Receiving Facility) during the period of the EIS study. The Federal Register of August 6, 2001 describes the Notice of Intent to Propose EIS (pp. 41009-41010) as including the NAB and the NRRF. In fact several references in the EIS still refer to NRRF, not SSTC-S (e.g., Fig. 3.11-4).<br>Any training of amphibious landing and helicopter support has taken place only in the past few years. And it is NOT quiet - per the EIS, noise from both munitions and helicopters is projected to dramatically increase. This should NOT be done in a residential zone. | Navy operations at SSTC-S began in 1920 when the Navy Radio Compass Station was established at the site. The installation included ship-to-shore navigational antennas and radio receivers, and was used for advanced communications training up to 1999. Blanks, small arms, and pyrotechnics have been associated with NSW training on SSTC-N since the 1960s. The nature and intensity of training on beaches at SSTC-S by NSW and EOD have remained unchanged since 2001. |
| 8. | Richard Barck | 2) Helicopter, Aircraft & Amphibious Noise - As residents local to SSTC-S we live in a particularly quiet area, especially during evenings and nights. There is relatively little traffic on CA-79 and many of us have doors/windows open to the sounds of breaking waves. Over the past couple of years we have been increasingly subject to LOUD helicopters/aircraft flying "close" to our homes. The sound prevents us from hearing evening TV -- or awakens us at night. When awakened, we often cannot immediately return to sleep. The noise could be greatly reduced by flying the helicopters/aircraft further offshore while on sorties north/south along the Silver Strand. We, as well as the residents of Navy housing, would appreciate that very much! | Helicopters support several SSTC training events. Under the No Action Alternative, up to 740 helicopters may be involved with SSTC training events. Approximately 100-150 helicopters per year fly into SSTC-S inland under the No Action Alternative. The remaining 590-640 helicopter operations occur offshore in the boat lanes or bay training areas.<br><br>As proposed under Alternatives 1 and 2, up to 1,643 helicopters may be involved with SSTC training events. Approximately 150-200 helicopters per year would fly into SSTC-S inland under Alternatives 1 and 2. The remaining 1,450 to 1,500 helicopter operations would occur offshore in the boat lanes or bay training areas. The most substantial increase in helicopter operations from baseline to Alternatives 1 and 2 would occur with the 386 new MH-60 mine hunting operations in the western portions of the boat lanes.<br><br>The typical flight pattern in support of SSTC-S inland training consists of an approach along the San Diego Bay flight corridor, turning west on the southern side on Emory Cove, |

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| | | | and beginning a descent into SSTC-S, targeting the drop zone to the west of Bunker 99 on the northern end of SSTC-S. Once established in this approach, the helicopters remain at 500 feet over residential neighborhoods and do not reduce their elevation to 150 feet until they are over SSTC-S. On departure, the helicopters ascend to the west over the Pacific Ocean.<br><br>As described in Section 3.6.1 of the FEIS (Affected Environment), a substantial amount of daytime and nighttime helicopter activity occurs in the vicinity of SSTC that is not associated with SSTC training activities. Nighttime helicopter transits from NOLF and NASNI, as well as to and from SSTC-S, occur only over water. The only helicopters overflying residential areas at night are Department of Homeland Security or U.S. Coast Guard. |
| 9. | Richard Barck | 3) SSTC-N - The portion of SSTC now called STTC-N (but formerly NAB) has been used for amphibious landing training for an extended period. Increased amphibious landings, helicopter activities and munitions training should be restricted to Boat Lanes 1- 10. | To train in real-world scenarios that may occur overseas, Navy personnel must train at various times of day, and in varying terrain and conditions. For example, the differences in training lane attributes at SSTC-S (nearshore in-water conditions such as the presence of sand bars or holes, beach conditions such as slope and depth of the beach, distance from other training activities occurring on SSTC-N oceanside beach and boat lanes) make them more suitable for meeting training needs than other available training lanes, and also fulfill the need for diversity in training locations |
| 10. | Richard Barck | 4) Snowy Plovers - Fish & Wildlife has formulated a significant effort in the last few years to increase Snowy Plover nesting/fledging in the SSTC -S area. Results for 2009 are in the table on the following page. Silver Strand S8 is the beach area with overnight facilities for RVs and heaviest beach use. Silver Strand NP contains staked-off area protecting nesting for the Snowy Plovers and Least Terns. The Navy should also be aware of the success in nesting and fledglings in the SSTC -S/NRRF. | The nesting and fledging success of snowy plovers at SSTC-S is accounted for in the Navy's analysis. The Navy has consulted with the USFWS, and has received a signed Biological Opinion (July 7, 2010) which concluded that, with mitigation measures in place, the Proposed Action would not jeopardize the continued existence of ESA-listed species. One condition of the Biological Opinion is that the Navy will coordinate with the USFWS in the development of the Long Term Habitat Enhancement Plan for SSTC and will submit the Plan to USFWS for review and approval. The Navy will allow USFWS 30 days to submit comments and an additional 30 days to approve the final study design and scope of work. |
| 11. | Richard Barck | 5) Vernal Pools and Fairy Shrimp - Vernal Pools are becoming few and far between, both as a result of drought and/or heavy pedestrian or vehicle use of the area(s) where they are found. There are very good protected Vernal Pool locations within SSTC -S/NRRF. Although the Navy | The Navy will avoid the occupied vernal pools and their watersheds adjacent to the road at SSTC-S Inland (i.e., pools 1 through 7 marked with flexi-stakes) year-round, to the |

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| | | has said that these area would be "protected" while wet, they would be used as trails and subject to traffic during "dry periods". Trails through Vernal Pools will effectively destroy them! They should continue to be protected. | maximum extent consistent with training needs. Foot traffic when the pools are dry consists primarily of small groups. Thus, trail forming and soil compaction are unlikely, resulting in no impact to population viability. Also, the Navy will be completing a Vernal Pool Management and Monitoring Plan to help determine whether the impacts identified in the EIS remain at the low levels expected. The Plan will include focused invasive plant inspection surveys in the pools and their watersheds; plant, topographic, hydrological, and water quality surveys (including salinity); and protocol fairy shrimp surveys. In addition, the Navy will be determining the baseline distribution and abundance of San Diego fairy shrimp and the condition of the vernal pool habitat prior to initiating training activities in or around the vernal pools at SSTC-S Inland. If impacts are more substantial than the low levels anticipated or impacts could lead to the extirpation of fairy shrimp from any individual pool, then the Navy will reinitiate consultation with the USFWS. |
| 12. | Richard Barck | 6) Beach White 1/ Boat Lane 11- From the view in Fig. 1-3, the training area appears to encroach on the southern edge of Silver Strand State Beach, an especially significant area for nesting of Snowy Plovers. | The current locations of White and Purple lanes reflect the locations of these lanes as portrayed on NOAA Chart 18772. No Navy records have been found that indicate when the lanes were designated. It has been determined that these differences in the delineations are a result of an archival data error. The Navy is working with NOAA so that the location of these lanes can be corrected by submitting a request to NOAA with corrected latitudes and longitudes. Please note that no Navy training occurs on the State Beach. |
| 13. | Richard Barck | 7) Beach Access - Many morning walkers and joggers use the Silver Strand NP as their starting point for extended exercise. A significant number continue these workouts headed south to the Imperial Beach area - or vice versa. The access past NRRF has been through the sand area below the high tide line. The apparent closing of this area deprives the public of even more beach access in a beach-limited area. | Beach access at SSTC-S is not restricted below the high-tide line unless there is a Navy activity that needs to restrict access for either safety reasons or security concerns. Training activities, when they occur, may require public access restrictions to one or more beach lanes below the mean high tide line, depending on the nature of the training activity (hazards, security, etc.). If and when restricted access is required, safety personnel are stationed to keep nonparticipants from harm, and to ensure mission security. |
| 14. | Richard Barck | 8) Silver Strand State Scenic Highway and Scenic Highway Overlay Zone - What impacts will the increased activities have on CA-79 as a scenic highway in this area? | Training activities presented in this EIS are typically not within the sightline of CA-79, and are not expected to affect the view from this designated Scenic Highway |
| 15. | Richard Barck | 9) Silver Strand Elementary School- What effect will the escalated training have on our elementary school including noise and pollution affecting our students and teachers? | Noise effects on Silver Strand Elementary School are described in Sections 3.6.2.2.3, 3.6.2.2.4, and 3.6.2.3.7 of the FEIS. The FEIS notes that some existing and proposed training |

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| | | | activities may occasionally disrupt the classroom environment, consisting of interference with speech and hearing, and distraction for 20 additional days per year. |
| 16. | Richard Barck | 10) Surf Camp - The surf camp at the southwest end of the NRRF site serves ~10,000 kids/year. We would like this to continue and their access to the beaches to remain safe and free of pollutants. | The FEIS does not identify any adverse effects of the Proposed Action on the safety of Camp Surf residents. Other than noise, offsite effects of the training activities proposed at SSTC-S would be minimal. |
| 17. | Edward Baumer | I have learned that the Department of the Navy is planning on increasing the levels of training at the Silver Strand Training Center. I hope that you can provide the level of quiet enjoyment that I have experienced for the last 8 years as I am a full time resident. | The Navy recognizes its proximity to adjacent communities, and has attempted to structure its training activities to achieve operational readiness while minimizing potential impacts to the surrounding area. The Navy has developed mitigation plans for activities that may cause an impact to the environment or surrounding areas, and has presented these in the EIS. As indicated in Section 3.6 of the FEIS, noise effects of Navy training activities at SSTC are managed via administrative controls (planning). Activity planning considers location (e.g., Breacher training is located in inland areas) and time of day. Call-outs during physical conditioning training are minimized at night and when in residential areas. As listed in NBCINST 3502-1, the Navy does notify local public safety agencies and city governments about specific upcoming hazardous or high-visibility night training events so that the local governments may disseminate the information to their communities. |
| 18. | Michael B. Baxter | I appreciate the opportunity to offer some further input and perspective on the proposed expansion of activities which will occur in the Imperial Beach area and Silver Strand training Complex<br>As a matter of disclosure, I have received the letter sent to you by the City of Imperial beach dates March 5, 2010 and agree with their observations and requests.<br>My comments herein should be considered in addition to theirs, and will be, I believe, concordant with them. I also have had the advantage of living on the oceanfront on South Seacoast Drive, north of Ream Field and south of Imperial Beach Boulevard for roughly the past 38 years. My comments are based on that period of observations.<br>My first observation is that helps departing ream Field do not maintain the centerline of the runways, or projection of it, from the field or landing pads all the way out to sea for a distance of about 1 3/4 miles, which is i believe the prescribed route for a visual departure (VFR Rules of Departure). I have publically asked for a copy of these departure rules in public in the past and they have never been provided. I hereby ask for them again under the Freedom of Information Act. | The typical flight pattern in support of SSTC-S inland training consists of an approach along the San Diego Bay flight corridor, turning west on the southern side on Emory Cove, and beginning a descent into SSTC-S, targeting the drop zone to the west of Bunker 99 on the northern end of SSTC-S. Once established in this approach, the helicopters remain at 500 feet over residential neighborhoods and do not reduce their elevation to 150 feet until they are over SSTC-S. On departure, the helicopters ascend to the west over the Pacific Ocean.<br><br>As described in Section 3.6.1 of the FEIS (Affected Environment), a substantial amount of daytime and nighttime |

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| | | Instead of following the VFR departure rules, too many times the aircraft drift off their departure radial, towards the Pier. My observation, and that of others, is that once they are over the surfline too many times they begin their turn to the north and head for the pier. This turn should not be commenced until the seaward track is complete, about 1 3/4 miles.<br>Many of observed Navy helos well inside the end of the pier. They then turn to sea again to "get around" the end of the pier before continuing north.<br>All this could be avoided by simply following the VFR Departure rules, as I believe I've seen in the past.<br>I would also ask that the VFR Departure pattern be amended so that departing helos continue to climb, perhaps to 450-500' as they depart Ream Field. This would reduce noise considerably.<br>Let me address the night hours of operation next. I agree with the City's position (#46) that "there should be no helicopter training at Ream Field after 9:30 pm."<br>I understand that from time to time a helo goes off course in its VFR departure from Ream Field. But I believe that far too much of this occurs and the community and residents are unable to effectively document this for the Navy with the present complaint system.<br>It is a system which has failed you and costs the Navy in public support and goodwill.<br>With the proposed increase in flight operations out of ream Field, I recommend the following:<br>1. Place the officer who takes citizen complaints related to Ream Field helos in the Ream Field tower, or a location very close by so he can easily determine the probable sidenumber of aircraft over the beach. require that the aircraft commander 'report' the completion of his seaward track when he is 1 3/4 miles out, back to the tower or Duty Officer. remember that a citizen cannot see the sidenumber against the setting sun, twilight, or night-time conditions. this step would naturally improve a complaint system which most of us rate as nonresponsive and a failure.<br>2. require that the citizen complaint officer stay at his post during his watch period. I would presume that there are four hour watches when flight operations are underway. He can bring a bag lunch, or a box lunch can be provided for him. The main point is that he/she is there to receive citizen complaints as they are occurring, not sometime later. from some very distant spot.<br>3. He should provide some sort of file number to the caller for future reference or follow up.<br>4. the results should be reported to the community, perhaps quarterly, to inform the policy-makers and the citizens.<br>I wish to acknowledge that many departures out of Ream Field are correctly done now, day and night both. And further, we appreciate everything which the military does to protect and defend this nation. By the same token, we should be willing to receive and take to heart constructive criticism when it is warranted and offer my observations and comments in that spirit. | helicopter activity occurs in the vicinity of SSTC that is not associated with SSTC training activities. Nighttime helicopter transits from NOLF and NASNI, as well as to and from SSTC-S, occur only over water. The only helicopters overflying residential areas at night are Department of Homeland Security or U.S. Coast Guard. Information on these flight patterns, as well as the percentage of sorties associated with training at SSTC, has been added to Sections 2 and 3.6 (Acoustic Environment) of the FEIS. The Navy acknowledges the FOIA request, and is processing the request in accordance with the FOIA. The Naval Base Coronado Public Affairs Officer can be contacted for noise complaints and operational suggestions.<br><br>Your comment addresses an issue that is outside the scope of this EIS. The NBC Commanding Officer has established air operations course rules for Naval Air Station North Island and the Naval Outlying Landing Field (NOLF, note formally known as NOLF Field) to conduct safe required training and operational flights while minimizing impacts on the surrounding community. These course rules are designed to promote safe air operations, meet Navy aviation training requirements, and protect communities beneath established flight paths. Pilots are given annual course rule briefs to ensure their familiarity with course rules, procedures, and noise abatement measures. Currently published air operation instructions (course rules) advise pilots when departing NOLF westward to either fly 1/4 mile south of beach houses or cross over beach houses at or above 800 feet above mean sea level (300 feet above the Federal Aviation Administration's minimums set in Federal Aviation Regulation 14 CFR Part 91, see reference below) until they are near the communication station (old Navy Radio Receiver Facility). Weather conditions, other aircraft in the flight patterns, etc. can and do affect the aircraft's flight route and altitude. Federal Aviation Regulation 14 CFR, Part 91 Section 119, titled Minimum Safe Altitudes, paragraph d indicates that helicopters may be operated at less than the following minimums prescribed for |

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| | | | other aircraft, e.g. over congested areas, 1000 feet above the highest obstacle within a horizontal radius of 2000 feet of the aircraft, and over other than congested areas 500 feet above the surface. The NOLF is open for flight operations during Pacific Standard Time (PST) from the last Sunday in October to the first Sunday in April, Monday through Thursday, from 0800 to 2230 PST and on Friday from 0800 to 1800 PST. The airfield is open during Pacific Daylight Time (PDT) from the first Sunday in April to the last Sunday in October, Monday through Thursday, from 0800 to 2300 PDT and on Friday from 0800 to 1800 PDT. The airfield is closed from 1800 local time the day prior to and during government holidays. These prescribed days and times are needed to conduct the required training to sustain pilot ratings and deployment qualifications. |
| 19. | Jim Besikof | I attended a briefing at the Coronado Cay Homeowner Association of your plans. After looking at the new fly patterns, your new plan will cause a lot of additional noise, in an already heavy fly over zone. Please reconsider your plan and move the flight patterns out to sea as far as possible. | The typical flight pattern in support of SSTC-S inland training consists of an approach along the San Diego Bay flight corridor, turning west on the southern side on Emory Cove, and beginning a descent into SSTC-S, targeting the drop zone to the west of Bunker 99 on the northern end of SSTC-S. Once established in this approach, the helicopters remain at 500 feet over residential neighborhoods and do not reduce their elevation to 150 feet until they are over SSTC-S. On departure, the helicopters ascend to the west over the Pacific Ocean.<br><br>As described in Section 3.6.1 of the FEIS (Affected Environment), a substantial amount of daytime and nighttime helicopter activity occurs in the vicinity of SSTC that is not associated with SSTC training activities. Nighttime helicopter transits from NOLF and NASNI, and to and from SSTC-S, occur only over water. The only helicopters overflying residential areas at night are Department of Homeland Security or U.S. Coast Guard. Information on these flight patterns, as well as the percentage of sorties associated with training at SSTC, has been added to Sections 2 and 3.6 (Acoustic |

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| | | | Environment) of the FEIS. |
| 20. | Fred Brown | I have lived here for 17 yrs and until recently found the Navy to be good neighbors. I appreciate the work you do and support your efforts.<br>But.... about a month ago after your announcement of planned increases in training the air activities and noise have become overwhelming to the point of intimidation. If this is a test to see how much noise we can tolerate, you have exceeded my threshold 4 weeks ago. I am very concerned that this will affect our quality of living and negatively affect our property values. | Increases in training activities associated with the Proposed Action and alternatives, which have not yet occurred, are not expected to disrupt normal business operations or affect property values in the ROI. As indicated in the Socioeconomic section of the FEIS (Section 3.15.2.3) regional and community employment, housing, and population growth are not expected to be affected by the Proposed Action. |
| 21. | Pat Brunson | The noise from the helicopters is quite bad at our house but I can't imagine how all the birds in this area can take. Plus the air pollution from that pink smoke floating over the Strand can't be good for us or the wildlife. | Reproductive success is routinely measured by Navy-funded monitors under the Navy's biological monitoring program. Background noise levels are sufficiently high such that noise as a result of training activity increases would not result in detectable effects. Considering the current success of least tern and snowy plover, noise was not expected to be an issue.<br><br>The Navy has a comprehensive air quality management program. Mitigation measures that are part of the Navy's air quality management practices are implemented at SSTC. Aircraft, marine vessels, ground vehicles, and military equipment are well-maintained, and meet applicable emission standards (such as smog certification for on-road vehicles) in accordance with state requirements. As indicated in Section 3.3.2.1.1 of the FEIS, emission factors for specific types of ordnance (including smoke grenades and flares) were obtained from the USEPA's AP-42 emission factor database. Section 3.3 and Appendix C analyze the pollutant emissions from all components of training activities presented in the EIS, and indicate that the emissions from all training activities are within air quality standards.<br><br>There will be little use of smoke grenades and flares directly in or over water. Use per training event in which smoke and |

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| | | | flares apply is also small (2-11 items). In addition, this use is spaced out both in time and space throughout the year and at various locations within SSTC, so there are no hot spots of air pollutants on the ranges.<br><br>Smoke grenade filler has approximately 11 ounces of a colored smoke mixture (white, red, yellow, green and violet). The smoke material is composed of a mixture of potassium chlorate, sodium bicarbonate, lactose, and a dye, none of which have—in the amounts or quantities specified in the EIS—significant environment effect. In addition, most of the filler is consumed during use. Chemicals in military flares can be a combination of magnesium, boron, potassium perchlorate, and barium chromate (USAF 1994), or in some cases red phosphorus. Red phosphorus is a common ignition compound used for instance in matches. Red phosphorus is a relatively non-toxic compound, although highly flammable and subject to environmental degradation in marine systems (Spanggord et al. 1985, EFRB 2010). In an analysis of military flares, the US Air Force found that most of the common flare constituents were consumed during flare ignition. Residual ash from flares contained small quantities of magnesium and boron (USAF 1994). Measured values of magnesium in flare ash [86 part per million (ppm)] were found to be below the natural seawater composition of magnesium (1290 ppm). |
| 22. | Elizabeth H. Butler | The letter below reflects several previous attempts to address the problems caused by intensified military air training over the Silver Strand. The current level of training has seriously impacted residents and visitors since 2007. We have not received any answers to reasonable questions or been asked to participate in co-creating alternatives. There are clear alternative helicopter routes and obvious means of notification and community education that would ease of the stress we live with. Only a few weeks ago we learned that we are part of a newly named Silver Strand Training Complex (SSTC) with high intensity, high profile maneuvers planned along the length of our State designated Scenic Route 75. Many City, County, and Federal funds and tireless volunteer and staff time and multiple interagency collaboration has gone into preserving the Silver Strand's scenic views, natural resources and unparalleled recreational and residential opportunities for military and civilians alike. Similar to the goal of the National Wildlife Refuge, we thought this area would be an outdoor haven for people and families in perpetuity. The projections in the proposed EIS do not reflect an understanding of this City, State and County | As proposed for Alternatives 1 and 2, up to 1,643 helicopters may be involved with SSTC training events. Approximately 150-200 helicopters per year would fly into SSTC-S inland under Alternatives 1 and 2. The remaining 1,450 to 1,500 helicopter operations would occur offshore in the boat lanes or bay training areas. The most substantial increase in helicopter operations from baseline to Alternatives 1 and 2 would occur\ with the 386 new MH-60 mine hunting operations in the western portions of the boat lanes.<br><br>The typical flight pattern in support of SSTC-S inland training |

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| | | mission, but rather suggest a militarization of an area previously shared with residents, visitors and the natural environment. In closing this memo, I would like to emphasize one of the most troubling aspects, perhaps the most egregious aspect, of the EIS. The increase in helicopter operations from 700 to 2300 is in addition to the current daily low flying helicopters that fly back and forth over the eastern shore of the Cays, Grand Caribe, Loews, and the State Park during peak hours 3-10pm. In the summer, they can do circular patterns every four minutes, often going later in the night. Perhaps, this routine helicopter exercise is an area where we can dialogue with the navy about 'balance' and community respect for their neighbors of forty years. | consists of an approach along the San Diego Bay flight corridor, turning west on the southern side on Emory Cove, and beginning a descent into SSTC-S, targeting the drop zone to the west of Bunker 99 on the northern end of SSTC-S. Once established in this approach, the helicopters remain at 500 feet over residential neighborhoods and do not reduce their elevation to 150 feet until they are over SSTC-S. On departure, the helicopters ascend to the west over the Pacific Ocean.<br><br>As described in Section 3.6.1 of the FEIS (Affected Environment), a substantial amount of daytime and nighttime helicopter activity occurs in the vicinity of SSTC that is not associated with SSTC training activities. Nighttime helicopter transits from NOLF and NASNI, and to and from SSTC-S, occur only over water. The only helicopters overflying residential areas at night are Department of Homeland Security or U.S. Coast Guard. Information on these flight patterns, as well as the percentage of sorties associated with training at SSTC, has been added to Sections 2 and 3.6 (Acoustic Environment) of the SSTC FEIS. |
| 23. | Elizabeth Butler | What AIR TRAINING is planned for the peak summer months July - October 2009? What part of this is 'routine' NBC practice? What constitutes 'routine' flying: what are the designated patterns or paths; what are the allowed weekday daily start and end times; are there different paths or curfews for weekends and holidays? What is the allowed or legally mandated flying height for helicopters over densely populated residential and recreational areas (i.e., how many feet above rooftops and bathers on a beach is considered safe or even 'courteous'? ). Are there safety height regulations set by the FAA and are there military exemptions? Are there other FAA regulations that say helicopters should fly a certain distance from the bay or ocean shoreline? Are the helicopters who fly round and round paths up the channels of the Cays performing a sanctioned practice? What part will be "SPECIAL" TRAINING MANEUVERS involving squadrons whose home base is located elsewhere? What are the start and end dates of the 'special' maneuvers? What time of day will they begin and end? Will the impacted time be the same for weekends as weekdays? Are major holidays included? When there are AIRSHOWS (e.g., Redbull Races, Miramar Airshow) or ceremonial demonstrations (e.g., off the Midway museum) in the San Diego area, routine military practice and/or practice for the special event are often diverted over the Cays and the Silver Strand. What is the summer/fall schedule for these activities? ***************** In the last two summers, the residents, real estate rentals, and | As described in Section 3.6.1 of the FEIS (Affected Environment), a substantial amount of daytime and nighttime helicopter activity occurs in the vicinity of SSTC that is not associated with SSTC training activities. Nighttime helicopter transits from NOLF and NASNI, and to and from SSTC-S, occur only over water. The only helicopters overflying residential areas at night are Department of Homeland Security or U.S. Coast Guard. Information on these flight patterns, as well as the percentage of sorties associated with training at SSTC, has been added to Sections 2 and 3.6 (Acoustic Environment) of the SSTC FEIS.<br><br>A discussion of helicopter activity has been added to Cumulative; Section 4.3.6. The Section discusses the various squadrons based out of NASNI and the number of helicopter |

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| | | other tourist businesses were not notified or prepared in any way for the negative impact of continuous low-flying helicopter and jet practice. This air activity is in addition to the advertising, fixed-wing planes which go back and forth above the State Beach and Park and often crisscross the Cays during summer months. The 'surprise' element of the last summers intense air activity evoked a range of negative emotions: fear from the 'high alert' noise and vibrations of helicopters; anger from having special family events and vacations ruined; and disbelief that all this was happening without notification from the City or any known public planning process. Trying to get information was difficult. People were referred to the navy control tower to make a "noise complaint" and asked to produce photographs of the plane, the number on the plane, the time and direction of the flight. The problem was not the disturbance produced by an aberrant, ill-trained, low-flying pilot. THE FEAR AND DISTURBANCE CAME FROM MILITARY TRAINING THAT COMBINED ROUTINE PRACTICE WITH INTENSIFIED SPECIAL MANEUVERS OVER A HIGH DENSITY RESIDENTIAL MARINE COMMUNICTY, ABOVE A POPULOUS STATE BEACH AND A 450 ROOM HOTEL-RESORT, SCHEDULED IN THE HOTTEST, PEAK USE SUMMER/FALL MONTHS. This inquiry is a request for information. It is also a request for some 'balance' and courtesy in the planning of training exercises. My experience with the military in recent years was that military leadership valued the commitment to be 'good neighbors' to impacted communities. Last summer, the Navy was not a good neighbor; it exploited our previous goodwill and caused us many problems. Perhaps, leadership in the military and the City have attempted to address these problems in their monthly meetings. It would be helpful to know if the environmental impacts of air training are discussed and planned for in these meetings. | flights that these squadrons generate. The Navy AICUZ study is being updated to identify all flights generated from NASNI and NOLF.<br><br>Your comment also addresses an issue that is outside the scope of this EIS. The NBC Commanding Officer has established air operations course rules for Naval Air Station North Island and the Naval Outlying Landing Field (NOLF, note formally known as NOLF Field) to conduct safe required training and operational flights while minimizing impacts on the surrounding community. These course rules are designed to promote safe air operations, meet Navy aviation training requirements, and protect communities beneath established flight paths. Pilots are given annual course rule briefs to ensure their familiarity with the course rules, procedures, and noise abatement measures. Currently published air operation instructions (course rules) advise pilots when departing NOLF westward to either fly 1/4 mile south of beach houses or cross over beach houses at or above 800 feet above mean sea level (300 feet above the Federal Aviation Administration's minimums set in Federal Aviation Regulation 14 CFR Part 91, see reference below) until they are near the communication station (old Navy Radio Receiver Facility). Weather conditions, other aircraft in the flight patterns, etc. can and do affect the aircraft's flight route and altitude. Federal Aviation Regulation 14 CFR, Part 91 Section 119, titled Minimum Safe Altitudes, paragraph d indicates that helicopters may be operated at less than the following minimums prescribed for other aircraft, e.g. over congested areas, 1000 feet above the highest obstacle within a horizontal radius of 2000 feet of the aircraft, and over other than congested areas 500 feet above the surface. The NOLF is open for flight operations during Pacific Standard Time (PST) from the last Sunday in October to the first Sunday in April, Monday through Thursday, from 0800 to 2230 PST and on Friday from 0800 to 1800 PST. The airfield is open during Pacific Daylight Time (PDT) from the first Sunday in April to the last Sunday in October, Monday |

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| | | | through Thursday, from 0800 to 2300 PDT and on Friday from 0800 to 1800 PDT. The airfield is closed from 1800 local time the day prior to and during government holidays. These prescribed days and times are needed to conduct the required training to sustain pilot ratings and deployment qualifications. |
| 24. | Harry Butler, Ph.D. | It seems foolish to me that the Navy would jeopardize the health and welfare of local residents in order to prepare to fight those who wish to damage the health and welfare of Americans. There seems to be no recognition in the Navy's plans that piercing noise, especially helicopter noise, will cause harm to local residents including local Navy families. It isn't necessary for helicopters to fly low over homes and continuously circle over the bay, state beaches and residential communities regardless of nighttime hours, weekends and holidays. This routine practice which intensifies in the hot months is not necessary. Helicopters can fly over the ocean. The residents of South Bay have worked their entire lives in order to save sufficient money to live in this desirable community. We are hard working, patriotic, taxpaying citizens who deserve better treatment than what has been occurring over the past three years and what is being proposed now Currently, helicopter noise causes nervousness, inability to relax and loss of sleep. There is a certain arrogance in the Navy which allows these unhealthy intrusions into private living space with no notice or consideration. I beseech the Navy to do two things: 1) Give additional time to the community to comment on this plan and make carefully researched suggestions. 2) Work with the community to consider alternatives to the noise and pollution impacts of current air training as well as the other more egregious elements of the proposed plan (as highlighted in the City's response). A cooperative plan that genuinely considers human needs for health, comfort and security would be a plan that benefits military families at the same time it benefits other local families. The Navy bruised its standing and respect locally by issuing an EIS that suggested that Americans employed in the military should "sleep in their own beds" while other Americans' sleep is dispensable. Please consider our needs as one. | Military training is continuous, evolving, and essential to keep pace with emerging requirements in the work place, e.g. new equipment, personnel turnover, and changing requirements to list a few. The Navy, like the other military services, must sustain and enhance individual, team, unit, and organizational skills and proficiency. Military training includes tactics, techniques, and procedures that must be rehearsed, refined, and recorded to certify Navy personnel (e.g. individuals, crews, teams, units, and organizations) qualified to carry out their respective assigned missions.<br><br>Additionally, the training activities associated with the SSTC have been specifically analyzed in the resource sections of the EIS. The additional training activities that are not associated with SSTC have been analyzed in the cumulative section of the EIS. The Navy has analyzed the activities associated with SSTC with both the public and the environment in mind to achieve operational readiness while minimizing impacts to the surrounding area.<br><br>The Navy appreciates the public involvement in the NEPA process. In response to requests by the cities of Imperial Beach and Coronado and citizens, the public and agency comment period for the FEIS was extended to March 30th. |

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| 25. | Cynthia Buxton | The navy , and the military in general have become very good environmental partners. What can the Navy do to keep the wild quality at a maximum albeit the times it is using the beach for exercises? Are there covert training maneuvers that are more subtle or invisible, and less impacting to the land? Is there a way the local public might help or become a part of the solution? What activities could be done south of the first jetty on the public beach? Could the public be involved in mock rehearsals? And thereby reduce the impacts north? Would the Navy make use of the resources at the public pier? The public could be used to identify what is effective "covert" and what isn't? Can the Navy make use of areas that are not on the beach?<br><br>I cannot know in full, nor I hope does anyone commenting that isn't in the Navy, but it would be honest to say, I do not know why after WWII, Korea, Vietnam, Desert Storm, and whatever post 911 is that now we find this expansion inescapably necessary. What are the alternatives considered? | The purpose of and need for these training activities are described in Section 2 of the EIS, which lists activities that require the use of beach or boat lanes, and those that can use inland training areas. Also as described in Section 2 of the FEIS, the Navy considered, but rejected, alternatives that included moving these exercises to other locations. Such alternatives fail to meet the purpose of and need for the Proposed Action. Additionally, alternatives were eliminated that investigated the distribution of military activities to different locations within SSTC. While the Navy appreciates your recommendation for public assistance in rehearsals, the general public is restricted from participating in these training activities for both military security and public safety. |
| 26. | Cynthia Buxton | The Navy is already doing a very good job. And I am very grateful.<br><br>In the last year, along with a number of hot environmental issues, Sunrise Powerlink not withstanding, I was made aware" of the MLPA by my environment colleagues volunteering day and night to establish sustainable guidelines for our oceans. Our local coast has many impacts, not only from the Navy and tourists, but in no small way from bait fishing and other commercial endeavors. What measures could the Navy take to help establish sustainable guidelines if they are to enter in larger capacity the current mix of impacting interest groups? The shore birds that are often the focus of marine environmental debate and concern depend upon this zone for survival. Unfortunately because the public has taken a zesty proportion of the urban share, there are few places for the birds to nest with reliable success.<br><br>The preserve around the elephant cage happens to be one of them. The shore birds may also feed on sand crabs. What impact does vehicle traffic have on san crabs and in turn on the shore birds that feed on them? 1think this question needs some research. 1 would be concluded that the traffic would reduce another food source for the birds. | Nesting areas for both the California least tern and western snowy plover have been established at the Delta beach areas, and mitigation measures are in place for nesting that occurs outside of these areas and within SSTC training areas. The concern for shorebird foraging is acknowledged; however, the best shorebird areas are avoided: mudflat, salt marsh, and salt pond. Beach wrack is left undisturbed (not raked). The remaining sandy shores and artificial structures are resilient to disturbance.<br><br>The analysis of foot, and vehicle traffic and amphibious landings indicated that impacts to the intertidal zone where sand crabs may occur is expected to be minimal due to the highly dynamic nature of the intertidal zone as well as the high recolonization rate of the organisms that inhabit this zone. |

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| 27. | Cynthia Buxton | I was taken aback by the notion that they Navy would run through the vernal pool when it is dry. Where do the critters go when it is dry? It is my understanding that they are still there, just dormant. (1 mentioned a paper on diapauses?) Running across this area, kicking up the top soils, disturbing whatever vehicle the plants and animals and microorganisms have for staying alive suspended throughout a dry summer would be radically abused by playing and training there. Is there someway to build a mock cover over this area to protect it? Would such a cover work?<br><br>This vernal pool is a beach vernal pool. Does this make it additionally rare and fragile?<br><br>In our backcountry, our streams become corridors of algae parchment; a vehicle I propose may play a role to perpetuate the fauna that takes life when the streams are running. Does such a vehicle exist for vernal pools? If so , and the creatures are there, buried, how will you protect them in the dry season? | The Navy will avoid the occupied vernal pools and their watersheds adjacent to the road at SSTC-S Inland (i.e., pools 1 through 7 marked with flexi-stakes) year-round to the maximum extent consistent with training needs. Foot traffic when the pools are dry consists primarily of small groups. As presented in Section 3.11 of the FEIS, trail forming and soil compaction are unlikely, resulting in negligible impact to population viability. Additionally, the Navy has consulted with the USFWS, and has received a signed Biological Opinion which concludes that proposed training activities will not jeopardize the continued existence of San Diego fairy shrimp.<br><br>Under conditions listed in the USFWS Biological Opinion, the Navy will complete a Vernal Pool Management and Monitoring Plan to help determine whether the impacts identified in the EIS remain at the low levels expected. The Plan will include focused invasive plant inspection survey in the pools and their watersheds: plant, topographic, hydrological, and water quality surveys (including salinity); and protocol fairy shrimp surveys. In addition, the Navy will determine the baseline distribution and abundance of San Diego fairy shrimp and the condition of the vernal pool habitat prior to initiating training activities in or around the vernal pools at SSTC-S Inland. If impacts are more substantial than the low levels anticipated or impacts could lead to the extirpation of fairy shrimp from any individual pool, then the Navy will reinitiate consultation with the USFWS. |

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| 28. | Cynthia Buxton | The Navy has been flying increasingly at night, and increasingly directly overhead, though since the public made considerable of it at the public forum, it may be a bit better lately. 1have been nearly asleep to be awakened by the helicopters. Sometimes leaving the windows open is impossible to do. One day I came home to find that my dog had gone through, literally through, a large window out of fright from loud noises. I confirmed with the neighbors who heard the noise and the window crash. It cost hundreds and lost me thousands in down time as I had to rebuild the wall with three double pane windows and all new trim to hold them. I really had no warning or decision as to when. Several weekends were taken through the Christmas Season to finish the project.<br><br>The YMCA is far closer than my house. I know how to extrapolate the meaning of training. Children at the Y may not. Many children that attend do so on scholarship as one of the first natural experiences or experiences at a camp they have ever had and for some ever will. The Y hosts over 10000 children every year. I know one such child, a woman now, who had difficulty learning in school. I saw many positive changes in her in the several seasons she attended this camp. She now pays her own way and holds a job with promotion and respect for several years. I think the Y played a roll in her turn around. In 1993 congressman Bilbray and Senator Boxer insured the continued existence of the Y for the next 50 years by establishing a 50 year least with the Navy. In 1998 the Navy decommissions the radar antennae, or elephant cage. I do not recall any loud noises back then. The Y Camp Surf has been in harmony with the Navy for many years prior as well.<br><br>What can the Navy do to minimize the startling and even frightening noise around children? | Helicopters support several existing SSTC training events. Under the No Action alternative, up to 740 helicopters may be involved with SSTC training events. Approximately 100-150 helicopters per year fly into SSTC-S inland under baseline training. The remaining 590-640 helicopter operations occur offshore in the boat lanes or bay training areas.<br><br>The typical flight pattern in support of SSTC-S inland training consists of an approach along the San Diego Bay flight corridor, turning west on the southern side on Emory Cove, and beginning a descent into SSTC-S, targeting the drop zone to the west of Bunker 99 on the northern end of SSTC-S. Once established in this approach, the helicopters remain at 500 feet over residential neighborhoods and do not reduce their elevation to 150 feet until they are over SSTC-S. On departure, the helicopters ascend to the west over the Pacific Ocean.<br><br>As described in Section 3.6.1 of the FEIS (Affected Environment), a substantial amount of daytime and nighttime helicopter activity occurs in the vicinity of SSTC that is not associated with SSTC training activities. Nighttime helicopter transits from NOLF and NASNI, and to and from SSTC-S, occur only over water. The only helicopters overflying residential areas at night are Department of Homeland Security or U.S. Coast Guard. Information on these flight patterns, as well as the percentage of sorties associated with training at SSTC, has been added to Sections 2 and 3.6 (Acoustic Environment) of the SSTC FEIS,.<br><br>The effects on the sound environment at the Surf Camp of Navy training at SSTC-S are addressed in Section 3.6 of the FEIS. This analysis concluded that the changes in the YMCA's sound environment associated with the Proposed Action would be minimal. Therefore, no sound-related mitigation measures were proposed. |

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| 29. | Cynthia Buxton | I have found on occasion, cylinders, with warnings of phosphorous. What can the Navy do to ensure the refuse of their activities will be removed? | As presented in Section 3.4 of the FEIS, most of the training materials used at SSTC are non-hazardous, or are rendered non-hazardous when they function as designed (e.g., blanks). Trainees collect and remove expended materials to the extent practicable at the conclusion of their training events. Very rarely, energetic items may not function as designed, resulting in their temporary presence until promptly retrieved by Navy personnel. The incidence rate of unretrieved expended items that would pose a risk to the public is so low that a public education and outreach program is not warranted. Given the extent of recreational, commercial, research, and industrial operations in the ocean and bay waters adjacent to SSTC, a wide variety of non-military wastes accumulate on the training beaches. In the event of finding expended material, contacting the POC at Naval Base Coronado will ensure that a team will arrive at the site, identify the item, and ensure its proper disposal. |
| 30. | Cynthia Buxton | I have seen whales breeching offshore during migration times. What can the Navy do to ensure the safety and integrity of these mammals? What research and precautions can you do to protect their sonar capabilities near yours as it is vital to their survival? | The Navy recognizes its proximity to adjacent communities, and has attempted to structure its training activities and mitigation measures to achieve operational readiness while minimizing potential impacts to the surrounding area. As described in the EIS (Section 3.9), Navy personnel monitor "buffer zones" surrounding activities that may cause underwater noise for the presence of marine mammals or turtles. If an animal is observed in one of the buffer zones, the activity is suspended until the animal is no longer within the buffer zone. |
| 31. | Cynthia Buxton | Have you reviewed the original grant to the Navy for use at the Southern end? I think this needs to be done. The EIS mentions a grant for the Navy when they were established there of fee simple. I have a question about this. Have you reviewed the original grant to the Navy for use just north of the Northern end of Imperial Beach. I think this needs to be done. See below an explanation from **Wikipedia on line. Fee Simple can be absolute or it can be fee simple defeasible. Fee Simple defeasible can be fee simple determinable and fee simple subject to a condition subsequent. Since the Navy suspended the use of the radar tracking and because the use by the children and family camp at the Y is well understood and established I find it hard to believe that in the establishment of the Navy grant with children present and the public walking | Based on property records, SSTC-S comprises about 548 acres of land that is held in fee-simple by the Navy. SSTC-S is owned by the federal government down to the mean high tide line.<br><br>Additionally, the Navy recognizes its proximity to adjacent communities, and has attempted to structure its training activities to achieve operational readiness while minimizing |

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| | | through, that the intention was that of fee simple absolute. I especially find it difficult to believe that that intention included the sounds of bombs bursting in air, so to speak. Have you checked to see what the stipulation was in the grant when the radar was no longer used and what was that intention? Who provided the grant? What were its conditions? It makes more logic that the Grant with an intention of mitigating the military usage of the beach originally, would include the portions used by the Y for families. I would not be surprised If the level of review were still in place to curtail an activity or in this case *life* frightening noises near the camp with fee simple subject to a condition subsequent. | potential impacts to the surrounding area. In light of this proximity, the Navy has developed mitigation measures for activities that may impact the environment or surrounding area, and has presented these measures in the EIS. |
| 32. | Cynthia Buxton | What can the Navy do to reduce the noise for training? I do understand there comes a time when training has to include operating under the startle of noise. Can this portion happen somewhere else? Can the solution integrate with the public presence as much as possible? | The Navy recognizes its proximity to adjacent communities, and has attempted to structure its training activities to achieve operational readiness and realistic training while minimizing potential impacts to the surrounding area. In this manner, the Navy is adding additional mitigation measures for alerting the adjacent communities about events which may be considered intrusive, as well as posting signs and other controls about public access to the beaches.<br>Additionally, and as described in Section 2 of the FEIS, the Navy considered, but rejected, alternatives that included moving these exercises to other locations. Such alternatives fail to meet the purpose of and need for the Proposed Action. |
| 33. | Earle Callahan CDR USN (Ret) | I have learned that the Department of the Navy is planning on increasing the levels of training at the Silver Strand Training Center. I agree entirely with the Navy plan. Their training is a necessity for the defense of the United States! Those that think otherwise should spend some time in/with the military, and see for themselves, and quit complaining. These Navy men/women training are willing to give their lives for their/your country, and do the local citizens' contributions and complaining match that? The Navy did provide for the least terns on the bay side and it is fenced off, which was Navy property. | Your comment has been noted. |

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| 34. | Earle Callahan | If anyone complains about the necessary Navy exercises on the Strand, they really must be pacifists, and un-American. All they can do is complain when they are living in the greatest country of the world, and probably none of them would fight and die for their country like the men/women on the ships and beaches at these exercises. They gladly prefer others to do it, so they can complain, and enjoy their good life in the USA. The Navy has already given lots of bay front property for the protection of the least terns, and even fenced it off. As far as water pollution, ask Tijuana to quit dumping sewage into the Tijuana River. When it rains, even the old tires and garbage ends up on U.S. beaches all the way to Coronado, when it follows the north flowing eddy currents from the south. Imperial Beach surf is always contaminated with Mexico's sewage. That is worth bitching about, and not the U.S. Navy maneuvers getting ready for battle!! | Your comment has been noted. |
| 35. | Benton Calmes | Add a sensitive receptor in Imperial Beach at Oneonta Elementary School. Noise extends further south than EIS indicates.<br><br>Reduce helicopter overflights in general. NO helicopter overflights over residential neighborhoods. I saw no reference to this in the EIS but it happens in Imperial Beach all the time. | The FEIS identifies Mar Vista High School and West View, Bay Side, and Imperial Beach Elementary Schools in Imperial Beach as noise-sensitive receptors. Oneonta Elementary School is located to the south of these schools, and would experience lower sound levels from military training activities on SSTC-South; however, this school has been added to the list of potential sensitive receptors in Imperial Beach.<br><br>As described in Section 3.6.1 of the FEIS (Affected Environment), a substantial amount of daytime and nighttime helicopter activity occurs in the vicinity of SSTC that is not associated with SSTC training activities. Nighttime helicopter transits from NOLF and NASNI, and to and from SSTC-S, occur only over water. The only helicopters overflying residential areas at night are Department of Homeland Security or U.S. Coast Guard. Information on these flight patterns, as well as the percentage of sorties associated with training at SSTC, has been added to Sections 2 and 3.6 (Acoustic Environment) of the SSTC FEIS. |

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| 36. | Ted Camaisa | Amphibious landing craft training poses minimal risk to the safety of residents living on Silver Strand. However, the increase in aircraft sorties in a combat training environment poses significant risk to residents in Navy Housing and the Cays. The Navy does not need another incident where an aircraft goes down on civilian housing, when realistic training could have been held in a low risk area like Camp Pendleton. Our pilots need to focus on realistic and unencumbered combat training, without concern for endangering residential homes. | The Navy strives to be a good neighbor, and analyzed all training activities at SSTC with respect to applicable federal regulations. The location of training has also been explored through criteria that were established to aid in the determination of the feasibility of a site or range for training. Section 2.1.3 of the EIS explains why the Navy cannot conduct these training activities in alternate locations. Due to a number of factors (training area availability, environmental constraints, proximity to base, etc.), Silver Strand was determined to be the best location for training among the identified alternatives.<br><br>San Diego Bay is at the center of a complicated airspace. The Navy has analyzed its flight tracks in the area for safety, as discussed in Sections 3.16.3.2.2 and 3.16.3.3.2. The Navy has determined that risks to the public from rotary-wing aircraft supporting SSTC training are minimal, based on its past safety record, the low number of flights, and the over-water flight paths. Flight tracks originating out of NASNI travel offshore and over the middle of San Diego Bay before accessing training areas to limit potential impacts to nearby communities. |

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| 37. | Joan Cameron | The helicopters begin practice well before the time this is written. Today I heard them by 4:30AM! | The current scope of the helicopter noise analysis is summarized in Section 3.6 of the EIS. As described in Section 3.6.1 of the FEIS (Affected Environment), a substantial amount of daytime and nighttime helicopter activity occurs in the vicinity of SSTC that is not associated with SSTC training activities. Nighttime helicopter transits from NOLF and NASNI, and to and from SSTC-S, occur only over water. The only helicopters overflying residential areas at night are Department of Homeland Security or U.S. Coast Guard. Information on these flight patterns, as well as the percentage of sorties associated with training at SSTC, has been added to Sections 2 and 3.6 (Acoustic Environment) of the SSTC FEIS. |
| 38. | Jim Cavanaugh | This is absurd... we need our military to be first in the world... stop trying to thwart them... support them. | Your comment has been noted. |
| 39. | Jennifer Chapman | As a resident of IB, I appreciate the military base and what it brings to the community. That said, please consider strongly any nighttime noise (2200 to 800). I don't care about daytime noise, but anything before 8am is a concern. At night I often hear helicopter noise emanating from Navy, local police, and border patrol. I also heard substantial noise that woke me up (and I sleep tight) and kept me awake when Transformers II was filmed at the Radio premises in the southern end of the Silver Strand. Since no one told the neighbors in IB, I thought that it was related to the violence in Tijuana, or something bad happening in IB. Please remember that you are not the only group and that the effect of all the noise is cumulative, and can actually be very frightening. Please avoid all noise possible from 2200 to 800 and give IB residents advance notice if you're going to have a night where you make noise anywhere approaching the noise made during the filming of Transformers. Thank you for all you do for our country. | The Navy recognizes its proximity to adjacent communities, and has attempted to structure its training activities to achieve operational readiness while minimizing potential impacts to the surrounding area. As listed in NBCINST 3502-1, the Navy does notify local public safety agencies and city governments about specific upcoming hazardous or high-visibility night training events so that the local governments may disseminate the information to their communities. Because of this and similar comments, the Navy is evaluating the possibility of extending advanced notification to the adjacent neighborhoods of Imperial Beach and Coronado through contact with City offices or the Naval Base Coronado website. |
| 40. | Jennifer Chapman | Please be sure to inform IB residents individually and directly (by a paper notice to each abode, for instance, not just by posting something on a website no one from IB reads regularly or posting a notice in a newspaper), if there are any Hazardous Materials or Wastes relating to this proposal known now or discovered in the future. | The Navy recognizes its proximity to adjacent communities, and has attempted to structure its training activities to achieve operational readiness while minimizing potential impacts to the surrounding area. The Navy does notify local public safety agencies and city governments about specific upcoming high-noise night training events. Local governments, in turn, are |

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| | | | responsible for informing their communities. The Navy is adding mitigation measures to the Proposed Action for alerting the adjacent communities about events which may be considered intrusive, as well as posting signs and other controls about public access to the beaches. |
| 41. | Jennifer Chapman | I like to jog on the beach side of the Silver Strand with my dog. Please ensure I continue to be able to do so! Also, I noticed the new big signs on the beach north of Palm (by the surf camp). You might think it's common sense to say people have to stay below the "mean" tidal line, but it doesn't. I assume you mean average by saying "mean," but when I'm on the beach, I only know where the tide is at that moment. It changes seasonally and daily and yearly, and can also depend on whether sand rejuvenation projects (sand dumping) happen. So please clarify whether you mean that we have to stay below where the vegetation grows, or what? Also, many hispanic-only speakers come to the beach, and if I have trouble understanding what is meant, I think non-native speakers will too. | As stated in Section 3.1.2.2.2 and 3.1.2.3.2 of the SSTC EIS, the Navy would not preclude the public from access to the public beach adjacent to an active training area. Active training does not typically occupy the entire stretch of beach at SSTC-S, but rather one or two training lanes. The public would be able to continue to use public beach adjacent to active training. On SSTC-N there is no public beach. The entire beach, including that portion of the beach below the high tide line, is leased from the State of California to the Navy for exclusive military use. On SSTC-S, the Navy owns the beach down to the high tide line. The State of California owns the beach below the high tide line. The Navy is adding mitigation measures to the Proposed Action for alerting the adjacent communities about events which may be considered intrusive, as well as posting signs and other controls about public access to the beaches. |
| 42. | Jim Clifford | An important issue I don't see addressed anywhere relates to a major step the Navy took a few years ago the last time they sought public input re these beach areas - they Navy tried to close about 2 miles of beach between the ymca camp and the south end of the state beach. this area has for many years - if not since time immemorial - been open to the public and is one of few beach areas of significant length in san diego where beachgoers can walk or run with their dogs. what i saw happen was that the day the navy tried to close the beach, the public simply wouldn't stand for it and defied the orders of navy security staff on the beach and simply walked up and down the beach right past obstacles the navy tried to use to prevent the public from entering the beach. it is troubling that the navy used such poor judgment in even considering trying to close this beach to which the public has always had such a long and strong connection and that they navy either didn't think thru or actually was ok with putting their security staff in a hugely problematic position of trying to stop the public by what? - arresting or shooting decent taxpaying citizens who simply can't believe the navy would be so arrogant as to presume that there is any reason for the navy to abscond with 2 miles of beach which should remain as it always has - open to the public?! so my concern at this time is whether in the midst of this ridiculously long document describing the navy's latest project for this beach there may | As stated in Section 3.1.2.2.2 and 3.1.2.3.2 of the SSTC FEIS, public access to public beaches adjacent to active training areas would continue to be allowed. Active training does not typically occupy the entire stretch of beach at SSTC-S, but rather one or two training lanes. The public would be able to continue to use public beach areas adjacent to active training areas. On SSTC-N there is no public beach. The entire beach, including the beach below the high tide line, is leased from the State of California to the Navy for exclusive military use. On SSTC-S, the Navy owns the beach down to the high tide line. The State of California owns the beach below the high tide line. Access below the high-tide line would only be restricted during some training activities for either public safety or |

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| | | somehow be a hidden agenda of again trying to close the beach? if so i'm sure they navy has learned they will have to string claymores to pull it off this time and even then they may have to explain some severed body parts (human and canine) in the national news for awhile. i wish i could view the navy and dod as being sane enough that we wouldn't have to even imagine the navy trying to close this beach but based on what i saw just a few years ago i see we have to be ever vigilant for some wash dc dod bureaucrat to come up with another arrogant and brilliant idea of affronting the very public whose tax $ fund everything the dod does thru out the world. so - to wit - is the navy in any way planning to curtail any public access to any of the beach between the ymca camp and the south end of the state beach (silver strand)? | mission security. |
| 43. | Lois Cohen | NO! On increasing training along Coronado's coastline! Unfair to Coronado and really a bad idea. | Your comment has been noted. |
| 44. | Mark Conrad | The noise level of the helicopter flying up and down the bay side has increased almost every year that we have lived here over the past 10 years. Often in the summer the sound is so loud it is difficult to carry on a conversation outside. We in the Cays will now have it on both sides if this goes into effect. This is a residential community and the Navy can use camp Pendleton which has many miles of beach and without the impact of the noise to residents. This will be negative impact on all of us. | As described in Section 3.6.1 of the FEIS (Affected Environment), a substantial amount of daytime and nighttime helicopter activity occurs in the vicinity of SSTC that is not associated with SSTC training activities. Nighttime helicopter transits from NOLF and NASNI, and to and from SSTC-S, occur only over water. The only helicopters overflying residential areas at night are Department of Homeland Security or U.S. Coast Guard. Information on these flight patterns, as well as the percentage of sorties associated with training at SSTC, has been added to Sections 2 and 3.6 (Acoustic Environment) of the SSTC FEIS. A discussion of this helicopter transport will be included in the Cumulative Impacts section of the FEIS, Section 4.3.6.<br><br>The Navy recognizes its proximity to adjacent communities, and has attempted to structure its training activities to achieve operational readiness while minimizing potential impacts to the surrounding area. Possible alternate locations for training |

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| | | | have been explored through criteria that were established to aid in the determination of the feasibility of a site or range for training. Due to a number of factors (training area availability, environmental constraints, proximity to base, etc.), other sites were determined to not be reasonable locations for training. |
| 45. | Mark Conrad | The terns have their nest along the shore lines and you suggest in your EIS draft that it is going to have little effect on the nesting. I think the noise itself will drive the birds away. The traffic and surely destroy many of the nest. | This is a high ambient noise environment in which nesting persists. Navy has achieved nesting success adjacent to the North Island airfield, which is a very high noise environment. As presented in Section 3.12 of the EIS, many of the noise inducing activities involving pyrotechnics, simunitions, and blanks take place inside bunkers, which reduces the intensity of noise that reaches nesting areas and other adjacent habitat. |
| 46. | Mark Conrad | Grunion along this beach have been laying their eggs in great numbers. In fact at high tide and full moon the beach is crowded with many people fishing for them. The demolitions and other activities of the Navy will have negative effect of the grunion. | It is probable that both excavation and crushing effects from landings would be localized. Overall species assemblages would be unaffected considering extent of adjacent habitat and infrequent nature of intrusive activities. Overall impacts to specific fish species and assemblages from underwater detonation activities would be temporary and local considering the expansive nature of the adjacent habitat, the population size, and dispersed nature of potentially effected fish populations. |
| 47. | Mark Conrad | There are many clams along the beach and I often go out at low tide and collect the legal limit. The impact of training and traffic will have negative impact on the clams. | The EIS noted that training activities could have impacts on marine plants or invertebrates from sediment disturbance caused by compression of the beach below the high tide line. However, all such disturbances would be highly localized and short term, given the highly variable intertidal environment, and would not have any lasting effects on plants or invertebrates. Additionally, invertebrates recolonize quickly because that is what they are adapted to do in a shifting environment; for instance, invertebrate beach dwellers tend to be very fast burrowers in the surf zone |

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| 48. | Mark Conrad | The noise and loss of the beach will have a negative impact upon real estate values in the area. | The SSTC training areas have been used by the Navy for over 60 years. Increases in training activities associated with the Proposed Action and alternatives are not expected to disrupt normal business operations or affect property values in ROI. In addition, there will not be a loss of beach area as a result of implementation of the Proposed Action. The analysis presented in the FEIS determined that regional and community employment, housing, and population growth would not be affected by the Proposed Action. |
| 49. | Elizabeth Copper | I do appreciate the opportunity to comment and as a contractor privileged to work with the endangered birds at Naval Base Coronado I applaud the Navy's many years of efforts on behalf of natural resources at their facilities at NBC. The military and particularly the Navy deserve the primary credit for increases in the population of the California least tern having pioneered the methods and set the standards that are now applied at successful sites throughout the range. Because of their outstanding efforts the Navy has been given significant regulatory relief to address the constraints imposed by the presence of such species as the least tern and the Western snowy plover. The benefits to the terns of this bargain and the significance of these efforts were clear in 2009, when NBC supported 22 percent of the least tern nesting attempts in California. NBC also supported the second largest population of nesting snowy plovers in Recovery Unit 6 and fledged as many young as sites with larger populations.<br><br>This Environmental Impact Statement (EIS) represents a lengthy effort to identify points of conflict between endangered species' management and Navy training and address potential resolution of those conflicts. However, the current status of the California Least Tern and the Western Snowy Plover neither of which is faring well, is not clearly portrayed in the EIS which may mislead the public regarding the potential consequences of the proposed actions. | The DEIS has been amended to explain the level of loss anticipated for the California least tern of the No Action Alternative compared to Alternative 1, estimated to be an increase of seven nests, on average, in a typical year. The difference in incidental take for snowy plover between the No Action Alternative and Alternative 1 is one nest, on average, in a typical year. As indicated in the July 7, 2010 USFWS Biological Assessment, the Navy will implement mitigation measures to schedule training in areas where less nesting occurs, when possible, and still meet training needs. In addition, the Navy will consider the tidal stage when developing training schedules, and schedule training activities that could be conducted on the hardpack during low tides when consistent with training needs. The Navy will develop a marking strategy to delineate least tern and snowy plover nesting areas that does not encumber training activities. Such a marking strategy provides visual references that identify sensitive nesting areas. The Navy may affix signs to existing beach lane sign posts and a limited number of additional markers, as determined appropriate by Navy staff.<br><br>The extensive monitoring program that the Navy implements has allowed for adaptive management to ensure avoidance and minimization of take, as well as positive contributions to recovery of both species. Nesting activity has increased despite the average historical annual loss of 38 nests (Figure 3.12-9), indicating a capability of the species to not only |

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| | | | continue to persist on SSTC, but also to increase, with training occurring in the nesting beaches during the nesting season. Much of this has to do with the Navy's mitigation measures and management practices. Based upon the available data, training activities at historical and proposed levels appear to be compatible with persistence of the least tern and western snowy plover at SSTC. Nesting areas have already been set aside on the bay side of the Silver Strand that exceeds the mitigation required for all past and current consultations. The Long Term Site Enhancement Plan which is part of the Proposed Action could increase the carrying capacity for terns by hundreds of nests. For snowy plovers, the long-term site enhancement plan is estimated to realistically mitigate for 34 nests annually. |
| 50. | Elizabeth Copper | Since 2001, Least Tern reproductive success in San Diego County has been declining with the steepest drops being seen at sites around San Diego Bay. This downward population trend is not addressed in the EIS. Methods for calculating population figures are under review and are relevant to providing a clear picture of the status of the species prior to approval of increased adverse effects. In 2009, only 72 young least terns fledged from Naval Base Coronado sites from 3,232 eggs laid and 2,364 chicks hatched. The losses are in no way attributable to the Navy, which has been diligent in attempting to reduce the predation that is the primary cause of these losses but it is nonetheless in this context that increased take is being sought by the Navy. It is NBC's 22 percent of the statewide population that suffered near complete reproductive failure in 2009. Both the increasing reliance on NBC and San Diego County military facilities to support the tern population and the declining populations at these sites suggests a need for the most diligent evaluation of projects that may adversely affect these birds.<br><br>In 2009, NBC supported almost one third of the snowy plover nesting population in San Diego County. Unfortunately, while the population numbers have wavered , breeding bird survey results in 2009 showed the entire coastal population to be down by 12 percent from what was recorded in 2005 despite aggressive management efforts throughout the range. The minimum number of pairs at NBC in 2009 was only 35. In addition to problems of predation and habitat loss, in San Diego there has been a continuing occurrence of unexplained adult mortality with 15 adults found sick or dead at NBC in 2009 alone. This gloomy context needs to be clearly provided in the EIS to enable the public to evaluate the potential consequences of project approval.<br><br>The absence of the Biological Opinion (BO), the U.S. Fish and Wildlife Service's review and response to the proposed actions, from this Draft EIS fatally handicaps the ability of the public | The information and mitigation measurements from the July 7, 2010 Biological Opinion have been input into the appropriate sections, and the mitigation measures will be updated as well. Additional analysis has been provided in the FEIS on the indirect and direct impacts of current and proposed military training, to include both an average anticipated impact as well as a high-intensity anticipated impact (See Section 3.12.3.1 (4), for example). Mitigation measures have been added to the Proposed Action. The benefits of current and proposed mitigation are also described and quantified to the extent practicable. As discussed in the analysis, the benefits of mitigation are expected to outweigh potential adverse impacts of training. In response to this and other comments received, the Navy has revised the EIS analysis on the California least tern (Section 3.12.3.1) and the western snowy plover (Section 3.12.3.2) to provide a more in-depth analysis of impacts that training is expected to have on the species.<br><br>Predation is discussed in Section 3.12.1.3.1; California Least Tern and Section 3.12.1.3.2; Western Snowy Plover. Gull-billed tern predation studies are underway by the Navy and other funders (including USFWS), and the Navy has requested |

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| | | to review the consequences of the proposed actions. The discussion of the complexity of the endangered species issues, e.g., downward population trends, plover adult mortality, unresolved predator issues, variation in management approaches, lack of control of public access, and perhaps most importantly the take allowances, reasonable and prudent alternatives and terms and conditions that will be applied to minimize loss, is accessible only in the Biological Opinion. I do not believe the public can adequately evaluate the impacts of the proposed alternatives until that BO is included. The 30-day time period between circulation of the Final EIS and publication of the Record of Decision would be inadequate to review the relationship between the Biological Opinion and the proposed actions and therefore the EIS should be re-circulated as a Draft including the Biological Opinion. | approval to relocate gull-billed terns from USFWS, without success. The Navy is working closely with the USFWS to assist it in addressing gull-billed tern predation. The Navy has submitted an application for a depredation permit to the USFWS annually since 2005 and has continued to document the impacts of this species. The Navy is supporting a radio-telemetry study by San Diego State University and USFWS during the 2010 nesting season. This study will research movements of gull-billed tern around San Diego Bay and analyze diet through stable isotopes.<br><br>A Biological Opinion has been provided by USFWS (9 July 2010), and its contents are incorporated in this EIS. The incidental take of California least tern is described in this Biological Opinion as: up to 8 percent per year of least tern eggs and chicks at SSTC North beaches; up to one least tern adult; and up to 10 nests moved. For western snowy plover, the incidental take is described as up to one active nest; up to five plover chicks; up to three nests moved; and up to three nests abandoned and brought into captivity.<br><br>Finally, among other avoidance and minimization measures that are Terms and Conditions of the Biological Opinion, the Navy will be coordinating with the USFWS in the development of the Long Term Habitat Enhancement Plan for SSTC. |
| 51. | Elizabeth Copper | Knowing how dramatically the nest numbers of the terns on the beach increased at NAB Ocean, I can understand that someone unfamiliar with plover biology might be fearful of the same kind of problem arising with the plovers. However, their nesting strategies are completely different. Neither snowy plovers nor any of their relatives nest in dense colonies anywhere in the world.<br><br>The snowy plover population in Recovery Unit 6 is unstable, has not met the Recovery Unit goals, and needs more aggressive management not less. The call for a cap on the number of plover nests to be protected is seemingly contrary to the mandate to recover this species. The justification offered for the cap suggests a misunderstanding of how plover nests are protected and does not take advantage of other opportunities to support training and minimize take. In | The Navy has proactively prepared for the expected take through actions taken prior to this request for take. This has been through site enhancement, management of lane usage, nest protection, and monitoring. Snowy plover nests are not necessarily going to be taken, just not protected over the 22 proposed. As a mitigation measure, the Navy will mark and buffer up to 22 concurrent snowy plover nests established at SSTC-N and SSTC-S beaches plus any additional nests that |

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| | | 2.1.3.7 in the discussion of the proposed cap, protecting no more than 22 simultaneously active plover nests in SSTC-S and N combined, is identified as the only way to prevent the presence of protected plover nests from rendering the beach lanes unusable. This is apparently based on some assumptions which are not correct or are not likely to occur. While the worst-case scenario could occur in which three plover nests would be established in a line at the crest 30m apart, this would not result in establishment of protected areas that would preclude the use of a beach lane. The size and configuration of the buffers provided for the plover nests is not to exceed 30m on a side but is often much smaller and nest marking has always been done to satisfy both the protective needs of the plovers and to accommodate training activities. The presence of 3 simultaneously active nests in the training lanes occurred twice in 2009 once in Yellow 2 and once in Red 1, the most heavily used training beaches at NAB Ocean. The calculation that 22 simultaneous nests would equal 2 nests per training lane is somewhat misleading as plover nests have historically been established in 9 of the 10 beach lanes at NAB Ocean and five of six beach lanes at NRRF (4 of them are training lanes)= ~1.67 nests per lane. | exceed 22 that are initiated in beach lanes Orange 1 and Orange 2.<br>The FEIS explains the level of loss anticipated under the No Action Alternative compared to Alternative 1, estimated to be an increase of seven nests, on average, in a typical year. The Navy will ensure that biological monitors look for and document the locations of least tern or snowy plover nests, eggs, and chicks prior to and after all military training exercises, to allow assessment of take associated with training activities.<br><br>The Navy has now added a more moderate scenario than the worst case scenario previously submitted in the Draft EIS, with results that are believed to be more realistic (see Section3.12.3.1).<br><br>Finally, the Navy's Proposed Action includes: ongoing nesting site preparation at the Delta Beaches; predator management; population monitoring; a Long Term Habitat Enhancement Plan; and measures to eliminate unauthorized recreational trespass, which are all conservation measures that support the recovery of the least tern. The Navy expects that implementation of these conservation measures will maintain the suitability of least tern habitat within the action area over the long term. The Navy's actions will increase the capacity of oceanside beaches and the Delta beaches to accommodate least terns and snowy plovers. |
| 52. | Elizabeth Copper | The provision of protected beach lanes has resulted in a clear concentration of plover nests in the protected lanes with 60 percent of the nests at NAB Ocean being established in those protected areas in 2009, achieving the goal of minimizing the effects of plovers on training and maximizing their nesting potential. Adding training in the protected lanes and removing the protective markers may disperse what nests are established into fully active training lanes and increase the likelihood of plover loss while decreasing the protection provided. The creation of the protected areas was a minimization measure which was successful but removal of protection should require more mitigation not lessen the existing protection with a cap. Without the Biological Opinion it is not possible to know how FWS has viewed this adverse result, what additional take would be allowed, how the allowance is justified, and what compensation is required to mitigate for the increased vulnerability. | Impacts to military training cannot be calculated on an acreage basis as you've suggested, because of the way training is conducted. Under current training conditions, as listed in Section 3.12 of the FEIS, Navy training officers are notified of the locations of the nests and buffers, and plan their training activities to avoid entering the buffer areas. A few training activities, such as individual basic physical fitness activities, may be able to work around the training buffers. These activities incorporate identifying and avoiding plover nest and |

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| | | The concern that two active nests would significantly impede training is belied by the fact that throughout the season in 2009, in many weeks, three of the training lanes at a time supported two active plover nests each. The calculation that 2 nests would obstruct 12 percent of a lane is also misleading. While 60m is approximately 12% of the length of a lane, even if the nests were lined up in a way that resulted in a 60m long line the actual acreage of the area protected by maximum buffers provided for two nests is only 0.4 acres (30m x 30m square)–only 3 percent of the acreage of the smallest training lane. | buffer areas into the activity. Other training does not require the use of beach areas, and thus would not be affected by the presence of plovers. Most other activities, however, are unable to operate around the buffers. The buffers are artifacts on the beach that do not occur in real world wartime situations, and thus adversely affect the value of training (e.g., presence of the plover nests restrict flexibility for maneuvering across the beach and inhibits real-time, tactical decision-making). Personnel may also focus on the stakes and no-go areas rather than learning their training mission. Restrictions imposed by stakes during training may lead to habitual avoidance measures and self-imposed concentrations of personnel, even in a combat environment, due to repetitious training with excessive staked boundaries. Activities involving heavy equipment and vessels require large unconstrained maneuvering space without encumbrances, precluding areas with buffered plover nests. To accommodate training requirements for these activities, the activities are often shifted in their entirety to the north or south, far enough away from the buffers so that personnel and equipment will not encounter or see the buffers/stakes. Under current conditions, this approach is feasible. Where needed, training activities can and are moved to other available training lanes that are free of plover nests or contain a maximum of two plover nests at one time. SSTC has historically typically had less than 22 active nests, at most, at one time. With the anticipated increase in training tempo of the SSTC training beaches (see Sections 1.5.1.1 and 3.12.3.1), training activities may not be able to be moved to other less encumbered beach lanes like they can be and are under current conditions. |
| 53. | Elizabeth Copper | The protected beach lanes offer a benefit in concentrating plover nesting and tern nesting contributing to a reduction in the number of nests in the regularly used training lanes and the potential for interference with training. Nesting density was higher in the protected beach lanes (8, 9, and 10) with a maximum of 5 simultaneous active plover nests occurring in a single lane at one time. Even with 5 simultaneous active nests protected by the maximum 30m square buffers the smallest beach lane would have no more than 8 percent of the lane lost to the protected plovers. | The Navy intends to enforce public access management of beach areas, and to assure the quality of the Delta Beach sites (which are not at capacity). The Navy's current and proposed mitigation measures more than compensate for any loss that could occur due to the Proposed Action, see FEIS Sections 3.12.3.1 and 3.12.3.2. The overall impact is expected to be low |

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| | | Even with 22 nests, simultaneously active, in beach training lanes with each given the maximum 30m square the acreage moved from training availability would be less than 4.4 acres of the 191+ acres available (128 –NAB Ocean; 63.9 –SSTC S). If all 22 simultaneously active nests were established only at NAB Ocean, using the maximum buffer they would occupy 3 percent of the training lane acreage. If the number of simultaneously active nests were doubled to 44 but the buffer was halved the area occupied between SSTC S and SSTC N would still be only 2 percent of the beach. This is but one minimization measure that might be recommended if needed. Again, the absence of the Biological Opinion does not allow the public to evaluate the consequence of the proposed actions.<br><br>Knowing how dramatically the nest numbers of the terns on the beach at NAB increased, I can understand that someone unfamiliar with plover biology might be fearful of the same kind of problem arising with the snowy plovers. However, their nesting strategies are completely different. This is not a species that ever nests in large or dense colonies. Even the current density found at NBC is exceptional. The differences cannot be emphasized enough and their requirements for recovery are not currently being met.<br><br>There is not adequate compensation identified for increased losses of terns and plovers that may occur as a result of heightened training tempo in what are the most concentrated nesting areas, The lack of adequate compensation is of particular concern in light of the continued reproductive failures at these sites for the last eight years. | as provided in the revised impact analysis of birds in Sections 3.12.3.1 and 3.12.3.2 of the FEIS, as well as the USFWS Biological Opinion, which concluded that with implementation of mitigation measures, training activities would not jeopardize the continued existence of ESA-listed species. The conditions of the Biological Opinion have been integrated into the FEIS, and are briefly described below.<br>The Navy will consider the tidal stage when developing training schedules, and schedule training activities that could be conducted on the hard pack during low tides when consistent with training needs.<br>Under baseline conditions, the southern three beach lanes are marked to facilitate avoidance of tern and plover nests. Since the Navy has determined that the level of marking done under baseline conditions presents an impediment to training, the Navy will develop a marking strategy to delineate least tern and snowy plover nesting areas that does not encumber training activities. Such a marking strategy may entail signs affixed to existing beach lane sign posts and a limited number of additional markers, as determined appropriate by Navy staff.<br>If relocation of any least tern or snowy plover nest/egg is necessary as a protective measure, each nest or egg will be relocated the shortest distance possible into suitable habitat by USFWS approved monitors to increase the chances of nest success. The weekly reports to be submitted to the CFWO under the proposed action will include: a) date the nests/eggs were moved; b) number of nests/eggs moved; c) original and ending location of nests/eggs moved; and (d) distance the nests/eggs were moved.<br>The Navy will include the following information in the yearly reports to be submitted to the USFWS under the proposed action: a) the number and distribution of terns and plovers observed in each training lane; b) the number of any dead or injured least terns or snowy plovers (including eggs, chicks or adults) observed in each training lane; c) the hatching rate of terns and plovers in each beach lane; d) maps of the locations |

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| | | | of tern and plover roosts within the action area; e) the timing and number of training events within the southern three beach lanes, and other beach lanes, to the extent available; f) the date and condition of any dead or injured tern or plover; and d) any measures taken to prevent additional tern or plover death or injury.<br>The Navy will ensure that biological monitors look for and document the locations of least tern or snowy plover nests, eggs and chicks prior to and after all military training exercises, to allow an assessment of take associated with training activities. |
| 54. | Elizabeth Copper | The level of unrestricted public use of all the training areas is not accurately portrayed with the beaches at NAB Ocean being described as closed to the public so that the effect of the removal of protective markers in the southern lanes would not be significant. The beaches at NAB Ocean are used constantly by the public coming both from Coronado and from Silver Strand State Beach as well as by people from nearby military housing. The NAB beach has been identified on the Park website as a recommended walk from the adjacent State Park. Despite military presence, suspected vandalism of snowy plover nests and take of snowy plover chicks has been documented at NRRF. Vandalism of Navy property in the training lanes is also a regular occurrence. Off-leash dogs are constantly present at NRRF. The signs providing rules and identifying training areas are few, many of them have fallen down, some are covered with graffiti, and all are ignored. There is currently little to no enforcement by military personnel of restrictions on recreational activity. The ability to control public recreational activity is critical to any successful resources program regardless of the project alternative approved.<br><br>The Delta beaches which are mitigation for the loss of least tern nesting habitat at Naval Air Station North Island need to be evaluated for the presence of contaminants. The sites are subject to management constraints based on the presence of ordnance and have not been evaluated for contaminants. The presence of the former argues strongly for evaluation of the latter. Future clean-up of ordnance may affect the availability of these sites. As the Delta beaches are the fallback nesting location for terns and plovers displaced by increased training at SSTC the quality of the sites should be assured.<br><br>I applaud the efforts the Navy has expended in its management of endangered species at NBC and it is the Navy's demonstrated ability to support both training and natural resources that has set the standard for resource management for much of the country. | The Navy is not proposing to remove protective marking on the southern three lanes of SSTC-S, nor was this stated in the FEIS. As indicated in the USFWS Biological Opinion and described in the FEIS, the Navy will improve the delineation of base boundaries to facilitate improved enforcement in these areas. This enhancement will include the installation of improved signage, k-rails, and a guard shack. At SSTC-N, temporary barriers and improved signage will be used to more clearly notify the public of the Navy's exclusive use of SSTC-N beach and existing restrictions on public use of those beaches. |

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| 55. | Shannon and William Davis | Training at the expense of endangered species is our concern. Endangered species are to be restored to a point that they are removed from the federal list.<br>We are opposed to the training activities, if you won't put protective fencing around each Endangered San Diego Fairy Shrimp's Vernal Pool habitat complex at the Navy Silver Strand Training Complex. Without fencing, foot traffic, military dogs, and vehicles may irrevocably destroy, by crushing impacts, the cysts, eggs of the San Diego Fairy Shrimp in dry season. While the EIS states it will try to avoid the vernal pools when they are wet, it clearly states that it expects there to be foot traffic in dry season.<br>The Navy is committed to complying with all applicable federal law, regulations and policies. Current management of vernal pools restricts all activities from the pools at all times. Environmental programs and policies have been developed to protect and improve air, water, and land, cultural resources, and national resources. The protection of natural and cultural resources has become an integral part of planning for training on 5.S.T.C. However, the protected sanctuary of the vernal pools is about to change for the worse from foot traffic, other traffic, pyrotechnic chemicals, and hydrocarbon residue from overhead aircraft. Chemicals introduce poisons into the pools. Hydrocarbons cover the surface of the water and restrict oxygen from the air reaching the water in the pools. Over time, the cumulative effect leads to destroying the ecological habitat of the vernal pool.<br>The San Diego Fairy Shrimp (*Branchinecta sandiegonensis*), species code K049 101, has been designated an endangered species in 1993 by the federal Environmental Protection Act of 1973. Why not designate 6 acres as a fairy shrimp pool complex preserve as the pools are separated on the order of meters? Currently, it looks like there are three complexes of pools at S.S.T.C.-S. In that the antenna array is no longer being used, which has a diameter of approximately 944 feet, that has an existing perimeter fence around this antenna array, which occupies an area of approximately 16 acres and could add 10 new available acres for training and set aside 6 new available acres for the fairy shrimp pool preserve. Figure 3.11-4 (Ephermeral Pools) shows the occupied pools have an area of 4.65 acres. Training could use the area between the pool complexes, but not through the pool complexes.<br>History has recorded the steady decline of the San Diego Fairy Shrimp vernal pools. These pools have existed for thousands of years. The major decline started in the 1940 to 1950 time period because of World War II. Additional decline occurred between 1979 and 1986 from urban development. Before development there was approximately 28,500 acres of vernal pool habitat in San Diego County. By 1986, only 7% of those acres remained. On February 3, 1997 it was reported that 70% of the remaining vernal pools were on N.A.S. Miramar or Camp Pendleton. By 1995 95% of the vernal pools were destroyed. In 2001 it was reported that 2,400 vernal pools existed. Between 2002 and 2003 only 3% of the vernal pools remain. In 2002, under President George W. Bush, a federal judge invalidated the critical habitat for the San Diego Fairy Shrimp. In 2009 President Barack Obama went to the National Environmental Protection Agency and ordered that all the protections of the endangered species that had been dismantled during the Bush era be put back which reestablished the critical habitat for the San Diego Fairy Shrimp. So, the pools are down to 3% remaining. Most (70%) are on government property. Some of the pools do not have the San Diego Ferry Shrimp which makes the pools that do have, become | Foot traffic entering the pool, as described in the EIS, does not mean troops of people walking back and forth over the pools. The nature of these training activities is dispersed. Each event is more likely to be one traverse over one pool, along a different path each time. The Navy agrees that cysts will be crushed and damaged in the dry season. However, there are tens of thousands if not millions of cysts, and the take of some during training on foot is not expected to be a population level effect. The 12 to 207 persons walking in a dispersed manner in the training area is not a large effect, considering the percent of the training area occupied by the pools. The nature and level of expected take have been addressed in a BA, and the Navy has completed consultation with USFWS (Biological Opinion signed July 7, 2010). The USFWS concluded that with mitigation measures in place, training activities associated with the Proposed Action would not jeopardize the continued existence of ESA-listed species.<br><br>The Navy will avoid the occupied vernal pools and their watersheds adjacent to the road at SSTC-S Inland (i.e., pools 1 through 7 marked with flexi-stakes) year-round to the maximum extent consistent with training needs. Foot traffic when the pools are dry consists primarily of small groups. As presented in Section 3.11 of the FEIS, trail forming and soil compaction are unlikely, resulting in no impact to population viability. Additionally, the Navy has completed consultation with the USFWS and has received a signed Biological Opinion which concludes that proposed training activities will not jeopardize the continued existence of San Diego fairy shrimp.<br><br>As part of the conditions of the Biological Opinion, the Navy will be completing a Vernal Pool Management and Monitoring Plan to help determine whether the impacts identified in the EIS remain at the low levels expected. The Plan will include focused invasive plant inspection survey in the pools and their watersheds; plant, topographic, hydrological, and water quality surveys (including salinity); and protocol fairy shrimp surveys. |

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| | | more significant in importance. Development was the main cause of the decline in the pools. Now the Navy wants to develop 5.S.T.C. - 5 which will further the decline of the pools if not protected as a fenced pool complex preserve.<br>We are patriotic and want our service men and women to have the best training. They deserve nothing less. Detente, the easing of strained relations, also applies to nature. A constant vigil of good stewardship needs to be kept for the endangered species to get off of the federal list. Thank you for considering our comments on this important matter | In addition, the Navy will be determining the baseline distribution and abundance of San Diego fairy shrimp and the condition of the vernal pool habitat prior to initiating training activities in or around the vernal pools at SSTC-S Inland. If impacts are more substantial than the low levels anticipated or impacts could lead to the extirpation of fairy shrimp from any individual pool, then the Navy will reinitiate consultation with the USFWS. |
| 56. | Ed Degenhart | I live just up the street from the helicopter base in Imperial Beach and have acclimated to the touch and go operations there for the past 20 years with no incidents or harm to the environment. I have no issue with the proposed increase in training and trust the US Navy to protect our environment and community's health and safety. I also respect the will of the Naval leadership to get their people the highest and best training for their call to service by our government. Anyone who is willing to risk their lives for our country has my total commitment and support to be properly trained to perform their duty.<br>May God Bless our Servicemen and thank you for your service to our country | Your comment has been noted. |
| 57. | William Dick | I have no problems with the Navy increasing the frequency of exercises on the Strand. My condominium is right above the SEAL compound and I have a direct view of activities to the south and west. I fully support all military activities on the Strand. I am never bothered by the military exercises and the Navy seems to be very responsible by minimizing noise when holding night activities. The Navy and the SEAL teams are part of my community and make living at Coronado Shores that much more exciting and enjoyable!! I love them. | Your comment has been noted. |
| 58. | Bill Dimmock | Imperial Beach is a very quiet and peaceful community. We enjoy the quiet of the evenings and walks along the beach. We feel that this training facility has and will interrupt the peacefulness of our nights and our use of the beach. I understand the need for training, but feel that Imperial Beach is such a family area that training needs to be moved to a less populous area that would not limit the training times and days that are required to create the perfect military personnel. There must be balance and we have lived in, although not perfect, balance with the military for over 20 years. Extended training hours and area would not only affect the harmony we have achieved it would destroy the quality of family life in Imperial Beach. Please consider the option that allows us to continue as is. | The Navy recognizes its proximity to surrounding communities and has attempted to structure its training activities to achieve operational readiness while minimizing any potential impact to the surrounding area. The Navy has developed mitigation for activities that may cause an impact to the environment or surrounding area and has presented these in the EIS.<br><br>The Navy considered time and location of training so as to minimize disturbances to the local community and does its best to conduct noise-producing activities during the day. However, to train in real-world scenarios that may occur, Navy personnel must train at night. Personnel need to train in these dark, late night conditions to ensure they are prepared for real-world operations. |

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| 59. | Cheryl Dimmock | We bought our home in Imperial Beach over 20 years ago. Although we could have moved anywhere, we chose this special area to raise our children. We felt at that time that there was no where on earth that offered all the advantages that were offered here. We knew that IB had a questionable reputation and that we would be sharing our area with a strong military presence, but these were small prices to pay to live in such a diversified area. Not only culturally, but biologically. The mornings spent on the beach, watching the seals and porpoises. The afternoons spent over by the bay observing sea birds and turtles. The times we watched the military training were all special times of great education for my children. The best scenario would be for the Navy to find another location and allow the area to go back to a natural and untouched state. We need to protect all the environment from human encroachment and nowhere in the state do we have such a fragile area as we have been entrusted with here in Imperial Beach. Since, I know that this possibility is just a dream, please consider the option of keeping the training and land use as you have been doing and not extending the hours and amount of use here.<br>There are schools and children and real people who need to continue with their lives, without having to be stressed over the noise, additional traffic, diminished access to the beach and the possibility that all the wildlife that is habituating and at this point thriving, will be affected by our careless use of what is an area of such living beauty. We need to consider other options. The decision to add additional training here would diminish our quality of life and what price is the Navy willing to pay for that. | The Navy strives to be a good neighbor and analyzed all training activities at SSTC with respect to applicable resources and regulations. The EIS analyzed a number of resources including land use and recreation (which addressed potential impacts to schools in the area), air quality, water resources, acoustic environment, socioeconomics, etc, air and water regulations.<br><br>As described in Section 2.1 of the EIS, possible alternate locations for training have been explored through criteria that were established to aid in the determination of the feasibility of a site or range for training. Due to a number of factors (training area availability, environmental constraints, proximity to base, etc.), other sites were determined to not be reasonable locations for training; please see Section 2.1.3. A specific example (for Camp Pendleton) is now provided in the EIS to illustrate why alternate locations are not feasible.<br><br>Additionally, the Navy recognizes its proximity to surrounding communities and has attempted to structure its training activities to achieve operational readiness while minimizing any potential impact to the surrounding area. In light of this proximity, the Navy has developed mitigation for activities that may cause an impact to the environment or surrounding area and has presented these in the EIS. |
| 60. | William Dorr | My concerns deal with the new use of Training Lanes 11 through 14, currently referred to by the Navy as SSTC-South. Let's be clear, until approx. 2 years ago, the Navy did not use this section for assault / beach access training or helicopter sorties. Now it's called SSTC-South? When did that happen? This half-moon shaped piece of land is bordered on one side by the ocean. The other side is surrounded literally by YMCA Camp Surf, which is attended by over 10,000 local children annually; Westview Elementary School, Imperial Beach; Over 500 private homeowners in Imperial beach; San Diego Bay National Wildlife Refuge; Coronado Cays, a residential community of 1200 homes, Silver Strand State Beach Park used by over 1 million people a year; Loewe's Coronado Hotel, which adds tremendously to the local economy and tax base and finally Camp Able, which serves Handicapped and challenged children and adults from throughout the southern CA area. SSTC-North and SSTC-South are separated on the ocean side of the strand by the CA Silver Strand State Beach Park.<br>To have 2200 helicopter sorties and assault and beach access training, including the discharge of | As indicated in Chapter 2 of the FEIS and in Section 3.1.2.3, the increase in training activities is spread out over the whole of SSTC, rather than just at SSTC-S. The Navy has developed mitigation for activities that may cause an impact to the environment or surrounding area and has presented these in the EIS and these are listed in Chapter 5.<br><br>As proposed for Alternatives 1 and 2, up to 1,643 helicopters may be involved with SSTC training events. Approximately 150-200 helicopters per year would fly into SSTC-S inland under Alternatives 1 and 2. The remaining 1,450 to 1,500 |

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| | | munitions will harm the area marked SSTC-South and have a very negative environmental impact on the surrounding community. If this is to be used for training, it should be very low impact and classroom type training. Confine the assault and sortie exercises to SSTC North, Lanes 1 to 10, where it has always been. The noise, pollutants, increased traffic and air quality will be harmed further in an area historically used for outdoor activities and wildlife sanctuary. The SSTC-South did not exist 2 years ago. That area has always been the antenna site. Nothing could have less of an impact on the area than an antenna site. To now convert it to overt and dangerous training and use the argument that the community should expect it is ridiculous. The helicopter traffic alone poses a huge potential for disaster to surrounding community sites that I just listed. The noise is well above what is has been historically. The Navy has let helicopters fly throughout the south bay area not heeding to the restricted flight corridors or following the agreed upon protocol. The ocean corridor is never used. To now triple the helicopter flights from 770 to 2200 a year and add the assault training at SSTC-South in the middle of residential locales, all less than 1/2 mile away is putting the public in danger unnecessarily.<br>Continue to train in Lanes 1 to 10 and leave the antenna site, Lanes 11 to 14 for non-invasive, non-polluting activities. | helicopter operations would occur offshore in the boat lanes or bay training areas. The most substantial increase in helicopter operations from baseline to Alternatives 1 and 2 would occur with the 386 new MH-60 mine hunting operations in the western portions of the boat lanes.<br><br>The typical flight pattern in support of SSTC-S inland training consists of an approach along the San Diego Bay flight corridor, turning west on the southern side on Emory Cove, and beginning a descent into SSTC-S, targeting the drop zone to the west of Bunker 99 on the northern end of SSTC-S. Once established in this approach, the helicopters remain at 500 feet over residential neighborhoods and do not reduce their elevation to 150 feet until they are over SSTC-S. On departure, the helicopters ascend to the west over the Pacific Ocean.<br><br>As described in Section 3.6.1 of the FEIS (Affected Environment), a substantial amount of daytime and nighttime helicopter activity occurs in the vicinity of SSTC that is not associated with SSTC training activities. Nighttime helicopter transits from NOLF and NASNI, and to and from SSTC-S, occur only over water. The only helicopters overflying residential areas at night are Department of Homeland Security or U.S. Coast Guard. Information on these flight patterns, as well as the percentage of sorties associated with training at SSTC, has been added to Sections 2 and 3.6 (Acoustic Environment) of the SSTC FEIS. |

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| 61. | Douglas Dribben | As a frequent tourist to Coronado, I especially enjoy seeing the Seals, the helicopters, and the ships offshore in exercises. This shows me where my defense tax dollars are going, and makes me proud to be an American. I salute the men of the Seal Teams and those men and women who support them, and encourage more exercises. The exercises do not damage the environment, and sharpen our defense capabilities. Do not think for one minute that they are not under observation by those who may be on the receiving end of the exercises one day, so they act as a wonderful deterrent to those who would do America harm. Please allow the Seals to expand their exercises as they desire. | Your comment has been noted. |
| 62. | Beverley Dyer | It was a shock on February 23rd to read in the San Diego Union of the Navy plans to increase the training along the Coronado coastline many times over the previous use. Even though I have lived in my home in Coronado Cays for over 30 years, never have we been contacted nor informed of this plan which has been studied for 10 years. Now we are allowed only two weeks to make any comment.<br><br>Since there have been no public nor individual contacts previously made with the local population during your Environmental Impact study few, if any, of the local population were aware of these drastic changes. The noise of helicopters and other aircraft, besides leaving an oily residue are already a hindrance without your increasing it three-fold. Blasts of gunfire and detonation already awaken us, create a dangerous odor. You expect that humans and all living creatures will not be affected by an increase of 10 times?<br><br>It was totally unethical and unprincipled for our government supported Navy to inhibit us from previous information. Why didn't the study include the many people who live on the Strand, the hotels, the many guests and tourists and campers who spend time in the area? Were the various organizations that sponsor beach activities informed and questioned? In which way was the human factor studied? We would like an answer.<br><br>At the poorly attended Coronado meeting at the Coronado Recreation Center on February 25 it was obvious that few people knew anything about your plans even though Environmental Impact report had begun 10 years ago.<br><br>Unfortunately, the public has only been given until March 9th to make comments concerning this issue. Is that fair? | The Navy has conducted numerous outreach events and briefs to local governments and special interest groups. Information was provided to your Association board regarding the EIS in late January 2010, timed with the public release of the DEIS. In response to requests by the cities of Imperial Beach and Coronado and citizens, the public and agency comment period for the FEIS was extended to March 30th. ,<br><br>The Navy recognizes its proximity to adjacent communities and has attempted to structure its training activities to achieve operational readiness while minimizing potential impacts to the surrounding area. The Navy has developed mitigation plans for activities that may cause an impact to the environment or surrounding area, and has presented these in the EIS. |
| 63. | Marilyn G. Field | I am writing with comments on the Navy's proposed expansion of training activities on the Silver Strand:<br>1) The Navy should not be increasing its operations on Coronado. Coronado is a small residential community which is already impacted by Navy traffic, noise and pollution. This has greatly increased with the nuclear aircraft carrier homeporting operations about 10 years ago. It is inappropriate to increase the burden on this small community when the Navy has other sites which might be used for training which do not burden any community Camp Pendleton springs to mind and there are other sites as well. It may not be quite as convenient but it is unfair to ruin a small community in the name of Navy convenience, not necessity. | As described in Section 2.1 of the EIS, possible alternate locations for training have been explored through criteria that were established to aid in the determination of the feasibility of a site or range for training. Due to a number of factors (training area availability, environmental constraints, proximity to base, etc.), other sites were determined to not be reasonable locations for training; please see Section 2.1.3. A specific example (for Camp Pendleton) is now provided in the |

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| | | | EIS to illustrate why alternate locations are not feasible. |
| 64. | Marilyn G. Field | 2) NEPA requires that all impacts related to a proposed course of action be analyzed in the EIS. However, the Navy has deferred analysis of the impacts from helicopter trips to and from the training areas. I believe this violates NEPA. | This FEIS analyzes training that would occur in the training areas of the SSTC. Additional information on aircraft overflights and a description of their flight paths that are not associated with SSTC training activities are now presented in Chapter 2, Section 3.6 and Section 4.3.6.<br><br>Helicopter activity discussion has been added to Cumulative; Section 4.3.6. The Section discusses the various squadrons based out of NASNI and the number of helicopter flights that these squadrons generate. The Navy AICUZ study is currently being updated to identify all flights generated from NASNI and NOLF. |
| 65. | Marilyn G. Field | 3) Helicopter sorties will increase by about 300%. If helicopters and fixed wing aircraft take off from North Island and transit to the training sites on the Silver Strand they should be required to fly over the ocean at a sufficient distance from land so as not to disturb residents on the ocean side of Coronado. No aircraft should be permitted to fly to or from the training areas over the Bay. Residents along the Bay are already impacted by Navy helicopter noise. The Bay is so narrow that it is not possible for aircraft to fly far enough away from residences to eliminate or minimize noise.<br>4) The EIS describes the following activities: triple the helicopter sorties, new (presumably larger) helicopters and amphibious craft, pyrotechnics, pile driving, nighttime helicopter hovering for 1- 2 hours, 50% increase in training incidences, almost tenfold increase in firearm firings and admits there may be sleep disturbances and communications disruptions. Yet the EIS concludes that there will not be significant noise increase because the training is dispersed over a larger area. On this basis, no mitigation is proposed. It is not credible that these activities will not cause significant noise increases to the residents of adjacent areas. These disturbances cannot be mitigated and therefore should not be permitted. | As proposed for Alternatives 1 and 2, up to 1,643 helicopters may be involved with SSTC training events. Approximately 150-200 helicopters per year would fly into SSTC-S inland under Alternatives 1 and 2. The remaining 1,450 to 1,500 helicopter operations would occur offshore in the boat lanes or bay training areas. The most substantial increase in helicopter operations from baseline to Alternatives 1 and 2 would occur with the 386 new MH-60 mine hunting operations in the western portions of the boat lanes.<br><br>The typical flight pattern in support of SSTC-S inland training consists of an approach along the San Diego Bay flight corridor, turning west on the southern side on Emory Cove, and beginning a descent into SSTC-S, targeting the drop zone to the west of Bunker 99 on the northern end of SSTC-S. Once established in this approach, the helicopters remain at 500 feet over residential neighborhoods and do not reduce their elevation to 150 feet until they are over SSTC-S. On departure, the helicopters ascend to the west over the Pacific |

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| | | | Ocean.<br><br>As described in Section 3.6.1 of the FEIS (Affected Environment), a substantial amount of daytime and nighttime helicopter activity occurs in the vicinity of SSTC that is not associated with SSTC training activities. Nighttime helicopter transits from NOLF and NASNI, and to and from SSTC-S, occur only over water. The only helicopters overflying residential areas at night are Department of Homeland Security or U.S. Coast Guard. Information on these flight patterns, as well as the percentage of sorties associated with training at SSTC, has been added to Sections 2 and 3.6 (Acoustic Environment) of the SSTC FEIS.<br><br>Helicopter noise is addressed in Sections 3.6.2.2.1 and 3.6.2.3.2 of the FEIS. The analysis of helicopter sound indicates that, while the number of helicopter sorties would increase substantially under Alternatives 1 and 2, the increased frequency of short-term sound exposures from increased helicopter pass-bys would not be sufficient to noticeably change the hourly average sound level at any one off-installation location. Because of the logarithmic nature of sound; a doubling of sound energy results in only a three-decibel increase, which under typical conditions is barely discernable. The analysis of helicopter sound is based upon broadly defined flight paths, consistent with a normal degree of variability introduced by pilot discretion, weather, time of day, and safety concerns such as other aircraft. |
| 66. | Marilyn G. Field | 5) The EIS notes that berms will be built in places along the Strand. This will effectively wall off the view of the ocean which residents and tourists enjoy. | As listed in Table 2-1, the berms will be built in support of ROWPU training, which is located close to the shoreline and has a relatively small footprint. There are no other manmade dunes on Navy training lanes. |

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| 67. | Marilyn G. Field | 6) The new and expanded training activities and the construction activities noted (including retail, recreational, housing and restaurant facilities) will increase traffic which is already greatly overburdening Coronado. There is no good solution to mitigate traffic and the Navy has been unwilling to contemplate any solutions which would significantly reduce the Navy's traffic. No activities which increase Coronado traffic should be permitted. Respectfully submitted, | SSTC EIS adequately addresses impacts to traffic based on increased training activities. There are no construction projects associated with this Proposed Action. The Average Daily Traffic (ADT) of Coronado roads was discussed in Table 3.14-2. The ADT of all public roads was calculated for all traffic, which would include any military traffic. The EIS analyzed the Level of Service (LOS) of local roads to determine the contribution to overall traffic on public roads from military activities. Based on the analysis, increases in military training vehicle trips per day would represent less than two percent of the total daily traffic, and the local road network would experience an acceptable LOS, except for intersections at Gates 1 and 2; those intersections would experience an unacceptable LOS. However, traffic generated under Alternatives 1 and 2 represent less than one percent of the morning volume and less than two percent of the evening traffic at these intersections, and this increased LOS would be well within the capacities of the existing regional roadway network. |
| 68. | Marilyn Field | The Navy should not be increasing its operations on Coronado:<br>Coronado is a small residential community which is already being severely impacted by the Navy's operations. Coronado and the Navy share this small island but the Navy's increase in operations over the past 10-15 years has created noise, increased traffic and air pollution. It is inappropriate to increase the burden on this small community - in essence ruin with further increases in noise, traffic, air pollution and adverse visual impacts when the Navy has other options for training which would not burden any community- Camp Pendleton springs to mind. It may not be as convenient but it is unfair to ruin a small community in the name of Navy convenience. | As described in Section 2.1 of the EIS, possible alternate locations for training have been explored through criteria that were established to aid in the determination of the feasibility of a site or range for training. Due to a number of factors (training area availability, environmental constraints, proximity to base, etc.), other sites were determined to not be reasonable locations for training; please see Section 2.1.3. A specific example (for Camp Pendleton) is now provided in the EIS to illustrate why alternate locations are not feasible. |
| 69. | William S. Field | Helicopter noise on San Diego bay is already a major annoyance, especially during the summer. The ramp up in training on the Silver Strand will increase historically helicopter flights (up to 3x I'm told), including flights from new helicopters to be stationed at North Island.<br>We live on the Bay in Coronado (Coronado Point). Any significant increase in helicopter traffic over the Bay will make living there intolerable. In part, this is heavy use. Navy pilots fly at less than 500 feet most of the time, and even at higher elevations the noise is a nuisance.<br>At the meeting I was told that the helicopter traffic patterns are not included in the EIS. This appears to be a violation of NEPA, which requires the total impacts of any project be included in | As proposed under Alternatives 1 and 2, up to 1,643 helicopters may be involved with SSTC training events. Approximately 150-200 helicopters per year would fly into SSTC-S inland under Alternatives 1 and 2. The remaining 1,450 to 1,500 helicopter operations would occur offshore in the boat lanes or bay training areas. The most substantial increase in helicopter operations from baseline to Alternatives |

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| | | an EIS. | 1 and 2 would occur with the 386 new MH-60 mine hunting operations,  in the western portions of boat lanes.<br><br>The typical flight pattern in support of SSTC-S inland training consists of an approach along the San Diego Bay flight corridor, turning west on the southern side on Emory Cove, and beginning a descent into SSTC-S, targeting the drop zone to the west of Bunker 99 on the northern end of SSTC-S. Once established in this approach, the helicopters remain at 500 feet over residential neighborhoods and do not reduce their elevation to 150 feet until they are over SSTC-S. On departure, the helicopters ascend to the west over the Pacific Ocean.<br><br>As described in Section 3.6.1 of the FEIS (Affected Environment), a substantial amount of daytime and nighttime helicopter activity occurs in the vicinity of SSTC that is not associated with SSTC training activities. Nighttime helicopter transits from NOLF and NASNI, and to and from SSTC-S, occur only over water. The only helicopters overflying residential areas at night are Department of Homeland Security or U.S. Coast Guard. Information on these flight patterns, as well as the percentage of sorties associated with training at SSTC, has been added to Sections 2 and 3.6 (Acoustic Environment) of the SSTC FEIS.<br><br>A discussion of helicopter activity has been added to Cumulative, Section 4.3.6 of the FEIS. The Section discusses the various squadrons based out of NASNI and the number of helicopter flights that these squadrons generate. The Navy AICUZ study is being updated to identify all flights generated from NASNI and NOLF. |

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| 70. | Gregory Fischer | As a resident of Imperial Beach for 18 years, I have a few comments. The east view from my residence on Seacoast Drive looks down the center line of the Navy's OLF runway approximately 1/2 mile away. There are helicopters conducting flight operations on most days. The noise is not at all a problem. What I hear is the sound of freedom. I truly want these pilots and air crew to be as proficient as possible in defense of our country. As for the Silver Strand Training Complex, I want our Navy SEALS to conduct as much training as they need, no matter the noise in the proximity of their base along the Silver Strand, recognizing their importance and vital mission for our defense. No bird, fish, ground cover or sensitive ear should have a higher priority over the vital training of our Navy SEALS. Thank you for the opportunity to comment. | Your comment has been noted. |
| 71. | Vincent J. Flynn, M.D. | This is in regard to the Silver Strand Training Area the navy proposes, to expand. I am a native of Coronado and have watched the navy's activities all my life in and around the Silver Strand. For the most part, they have taken good care of the natural resources in the area and I have no complaints. But I must object to the increased activity in and around the old Fort Emory, the area just north of Imperial Beach. Much has changed since WWII when that area was so very important to national security. It has been repopulated with the wild species that were there 100 years ago, they have reclaimed it for their own. In my opinion, it would do much harm to the environment to reclaim this area for navy purposes. The navy should leave it alone and allow the public access to the beach area. There is still a lot of beach area available to the navy at North Island and Camp Pendleton. Give the citizens a break and do not extend your already large claim on the small area of Coronado. | The Navy strives to be a good neighbor, and analyzed all training activities at SSTC with respect to biological resources. As described in Section 2.1 of the EIS, possible alternate locations for training have been explored through criteria that were established to aid in the determination of the feasibility of a site or range for training. Due to a number of factors (training area availability, environmental constraints, proximity to base, etc.), other sites were determined to not be reasonable locations for training; please see Section 2.1.3. A specific example (for Camp Pendleton) is provided in the FEIS to illustrate why alternate locations are not feasible. Additionally, the Navy recognizes its proximity to adjacent communities, and has attempted to structure its training activities to achieve operational readiness while minimizing potential impacts to the surrounding area. The Navy has developed mitigation plans for activities that may cause an impact to the environment or surrounding area, and has presented these mitigation plans in Chapter 5 of the FEIS. |
| 72. | Jeffrey G. Foster | The projected increase in activities, 48% increase in sound-generating activities, could cause a noticeable difference in the peacefulness of north I.B. Please choose the no action alternative and maintain current level of activities. I.B. residents should be considered first and foremost in making this decision as we will be the most impacted. beach access and the bird life along the Silver Strand are also coveted and are part of what make this a special place. Please leave the current situation as is. Choose the no action alternative and do the extra training elsewhere where the public will not be as impacted. | The projected increase in activities at SSTC-S would not translate into a general 48-percent increase in sound exposure of Imperial Beach residents. While helicopter sorties, shotgun breacher training, and amphibious landing exercises on SSTC-S all would increase, they also would occur in various locations at different points in time. The distribution of these activities over time and space is such that the change in the sound environment for any individual resident cannot be quantified. The commenter’s preference for the No Action |

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| | | | Alternative is noted. |
| 73. | Frank Gaines | The need has long been established as has the wise stewardship of our military on the lands needed. I totally support the request and the uses identified. | Your comment has been noted |
| 74. | Gerd Geissler | Having lived in Imperial Beach next to the Naval Antennae for over 40 years we are familiar with Naval Warfare training (which has only increased in recent years). We have not complained one bit about the noise at night (bomb blasts and machine gun fire) nor the increased helicopter traffic OVER our houses. Now you are telling us we will not only have this noise continue but it will be for longer hours and be even more disruptive to our once quiet neighborhood? The helicopter take offs and landings echo off the walls as it is and you want to do hundreds more? We are living in this community and we respect the Navy but feel that they do not respect us back. We deserve peace and quiet. The noise concerns we have are real and I don't think any of you would want to relocate your beautiful home to right across from a loud, disruptive training facility so why are you making us do that? You already take half the Strand for your training--leave us to our peaceful part down in Imperial Beach. | As proposed under Alternatives 1 and 2, up to 1,643 helicopters may be involved with SSTC training events. Approximately 150-200 helicopters per year would fly into SSTC-S inland under Alternatives 1 and 2. The remaining 1,450 to 1,500 helicopter operations would occur offshore in the boat lanes or bay training areas. The most substantial increase in helicopter operations from baseline to Alternatives 1 and 2 would occur with the 386 new MH-60 mine hunting operations, in the western portions of the boat lanes.<br><br>The typical flight pattern in support of SSTC-S inland training consists of an approach along the San Diego Bay flight corridor, turning west on the southern side on Emory Cove, and beginning a descent into SSTC-S, targeting the drop zone to the west of Bunker 99 on the northern end of SSTC-S. Once established in this approach, the helicopters remain at 500 feet over residential neighborhoods and do not reduce their elevation to 150 feet until they are over SSTC-S. On departure, the helicopters ascend to the west over the Pacific Ocean.<br><br>As described in Section 3.6.1 of the FEIS (Affected Environment), a substantial amount of daytime and nighttime helicopter activity occurs in the vicinity of SSTC that is not associated with SSTC training activities. Nighttime helicopter transits from NOLF and NASNI, and to and from SSTC-S, occur only over water. The only helicopters overflying residential areas at night are Department of Homeland Security or U.S. Coast Guard. Information on these flight patterns, as |

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| | | | well as the percentage of sorties associated with training at SSTC, has been added to Sections 2 and 3.6 (Acoustic Environment) of the SSTC FEIS. |
| 75. | Gerd Geissler | We are on Silver Strand and Carnation. The traffic goes directly in front of our lot. We are concerned about excessive speed and traffic backing up along Silver Strand. We would like to recommend that the northerly gate be used for access into the base. We would also recommend considering a light at Silver Strand and Palm Ave. Speed limit needs to posted. Also concerned about noise levels after 10 pm. | The Navy is responsible for traffic on its controlled land. Once personnel leave SSTC-S, they are subject to Department of Transportation regulations. Speed and traffic control measures are the responsibility of the City of Imperial Beach. Please note that due to this and similar comments, the Navy is considering increasing signage or providing a message board requesting Navy personnel to obey all posted speed limits, keep radios turned down, etc., as personnel leave the base, as the Navy currently does at Naval Base Coronado, Naval Amphibious Base – Coronado, and Naval Base San Diego.<br><br>Please note that due to your comment and other similar comments, the Navy is assessing the feasibility of using the north SSTC-S gate for ingress/egress. Such use would depend on many factors, such as CALTRANS signal/signage changes and the City of Coronado authorization of the new access point.<br><br>Your concern about noise from nighttime training activities is noted. Traffic noise along Silver Strand from late night training activities would be minimal and infrequent, as few training activities take place on SSTC-S, and those that do typically involve small groups. Night training is an essential element of the Navy's training program at SSTC because many military activities, such as clandestine operations, are conducted at night and military personnel must train under realistic conditions. Noise from nighttime training activities at SSTC is addressed in Sections 3.6.2.2.6 and 3.6.2.3.7 of the EIS. As listed in NBCINST 3502-1, the Navy notifies local public safety agencies and city governments about specific upcoming hazardous or high-visibility night training events so that the local governments may disseminate the information to their communities. Because of this and similar comments, the |

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| | | | Navy is evaluating the possibility of extending advanced notification to the neighborhoods of Imperial Beach and Coronado through contact with City offices or the Naval Base Coronado website. |
| 76. | Lilo Geissler | We live along Silver Strand Boulevard and have had to contend with traffic going in and out of the Naval base at all hours. The people who are driving take no heed to the fact that this is a residential area and should be driven at under 25 mph. They speed out of the base at about 40-50 mph putting children and pets at risk. Now you say you want to increase training which would in turn increase the number of cars using Silver Strand Blvd. as their route? Why should we have to put up with the dangerous conditions these cars pose? Why do we have to fear an accident will occur when these hazardous drivers are speeding along our neighborhood roads? We do not want the heavy traffic congestion along our peaceful street and we do not want the added pollution associated with so many extra cars. Why not open the gate along the Silver Strand (after the berm) and make that available if you are to continue with more training exercises? Our neighborhood was not built to be a thoroughfare for large amounts of cars and we don't like the dangers they would bring. | The Navy has reviewed applicable traffic studies and has presented their results in the Section 3.14.1.2 of the EIS. While there is an abundance of traffic along the Silver Strand/Highway 75, it should be noted that the comment being referenced only accounts for traffic that is associated with the training activities at SSTC. The impact of that traffic (only associated with the SSTC training activities) relative to the overall traffic on area roads is presented in the resource section of the EIS as well as the cumulative section of the EIS. Currently, intersections and roadways within the ROI typically experience an acceptable LOS. Although the intersections at Gates 1 and 2 experience unacceptable LOS, traffic related to the Proposed Action represents less than 1 percent of the morning volume and less than 2 percent of the evening traffic at these intersections. |

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| 77. | Dani S. Grady and Ralph J. Greenspan, Ph.D. | We are writing to express our serious concern and opposition to the Navy's planned expansion of military exercises on The Strand. There are several reasons for our opposition: human health, environmental concerns, impact on residential atmosphere, and impact on the local economy. Our family is proud of the Navy and strongly supportive and proud of our military, and we understand the need for expanded military training. The eldest son in a Coronado family with whom we are very close is currently in the Navy Seal training program, and so we have an additional personal connection with the need for the best training possible. Over the past few years, the level of military exercises in Coronado has been increasing in both frequency and intensity. It is plainly audible from our home on Glorietta Blvd. Thus, we have been patient with the expanded use of these training areas, but now feel that the noise levels we currently experience are near the tolerable limit. We feel strongly that the place to expand such operations, however, is not Coronado, but the Navy's more isolated sites at Camp Pendleton and at the offshore islands. The noise we experience at our home, however, is not the only reason for our concern. There are many more: | The Navy recognizes its proximity to surrounding communities and has attempted to structure its training activities to achieve operational readiness while minimizing any potential impact to the surrounding area. The Navy has developed mitigation for activities that may cause an impact to the environment or surrounding area and has presented these in the EIS. The EIS addressed socioeconomics and beneficial impacts associated with the Navy's Proposed Action. Existing regional population and associated housing impacts, employment rates, and regional economy would remain unchanged.<br><br>The Navy considered time and location of training so as to minimize disturbances to the local community and does its best to conduct noise-producing activities during the day. However, to train in real-world scenarios that may occur overseas, Navy personnel must train at night. Personnel need to train in these dark, late night conditions to ensure they are prepared for real-world operations. All potential impacts related to noise are addressed in the Acoustic Section; Section 3.6.<br><br>As described in Section 2.1 of the EIS, possible alternate locations for training have been explored through criteria that were established to aid in the determination of the feasibility of a site or range for training. Due to a number of factors (training area availability, environmental constraints, proximity to base, etc.), other sites were determined to not be reasonable locations for training; please see Section 2.1.3. A specific example (for Camp Pendleton) is now provided in the EIS to illustrate why alternate locations are not feasible. |
| 78. | Dani S. Grady and Ralph J. Greenspan, Ph.D. | Human health – One of the principal consequences of expanded war exercises on The Strand would be noise pollution, which is well documented to cause hypertension, high stress levels, tinnitus, hearing loss, sleep disturbances, and harmful emotional effects. The radius affected by this noise pollution extends well beyond the area immediately adjacent to the site, given the magnitude of the noise and the efficiency with which sound travels over water, thus exposing the entire southern half of Coronado. | The acoustic analysis presented in the FEIS describes the real-time effects of the various types of training sound on exposed individuals, such as speech interference and sleep disturbance, that can result in annoyance and stress. The FEIS acknowledges that such effects would occur occasionally, but |

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| | | | concludes that the incremental effects of sound from the proposed training activities at SSTC would not have a substantial effect on the acoustic environment.<br><br>Hearing loss may occur where individuals are exposed to a sustained noise level of 85 dB or above. The training activities at SSTC do not result in sustained sound levels of this intensity in off-installation areas. Therefore, tinnitus and hearing loss would not occur as a result and are not a concern for SSTC training activities.<br><br>Emotional reactions to noise are not related to the intensity of the sound, generally are based on the life experiences or expectations of the receptor, and may be influenced by several factors other than noise. Environmental noise metrics and community noise standards thus do not provide a basis for assessing such effects. The relationship between noise and such conditions is thus unpredictable, although the Navy acknowledges that a substantial increase in the frequency of impulsive noise events is likely to result in some increase in such reactions in the community. |
| 79. | Dani S. Grady and Ralph J. Greenspan, Ph.D. | Another major effect would be air and water borne pollutants, toxic debris, and shoreline contamination from toxic chemicals that are carried in or produced by exploded ordinance. These include toxins and carcinogens such as depleted uranium, mercury, and lead, as well as irritants and irritant producers such as titanium tetrachloride, red and white phosphorus. This is to name just a few of the ordinance-associated chemicals known to be harmful to humans. Loss of residential atmosphere – We have just spent several years instituting a new revision of zoning requirements based on the widespread sentiment that Coronado residents wanted to preserve their village atmosphere. Nothing will destroy that atmosphere more quickly or thoroughly than the frequent and continual sounds and smells of war exercises. Our troops are crucial to our safety and we support them, their training, and their families. Many of them and their families also live here in Coronado. Proper support requires that we provide appropriate separation between domestic living arrangements and war simulations. This is especially relevant given the widespread occurrence of PTSD and related disorders in returning service personnel. | Toxic debris and shoreline contamination are addressed in Section 3.4 (Hazardous Materials and Waste) and Section 3.5 (Water Quality) in the EIS. Depleted uranium is not used in training at SSTC.<br><br>A full analysis of air quality has been performed and the results are presented in Section 3.3 as well as Appendix C of the FEIS. |

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| 80. | Dani S. Grady and Ralph J. Greenspan, Ph.D. | Ecological impact – The Navy's own Environmental Impact Statement acknowledges that there will be a significant impact on marine ecology, including bioaccumulation of chemicals in the food chain, death from exposure to toxic chemicals and bomb blasts. In addition to direct physical harm, there is also the impact of noise on animal life in the reduction of usable habitat, which in the case of endangered species hastens the path towards extinction. The Navy's training use of sonar has already increased the deleterious exposure of marine mammals, and this expansion will further increase the burden of noise pollution on them. | The EIS analyses disturbance to habitat and direct impacts to fish and other marine animals. Habitat impact has been determined to be minimal, and mitigation measures decrease the possibility of impact to marine mammals.<br><br>Regarding ecological impacts: all alternatives avoid effects on marine algae, plants, and invertebrates in areas where densities of these organisms are the greatest: the salt marsh, mudflats, and salt pond. On the beach, vehicle use, boat landings, helicopter landings, and foot traffic associated with a range of activities could cause temporary localized disturbances of infaunal invertebrates of the sand.<br><br>Minimal disturbance of sandy bottom habitat and increased turbidity from amphibious landings and underwater demolitions.<br><br>A total of 1.13 acres of eelgrass habitat may be impacted in the designated training lane within the Bravo training area. Management practices are in place for jurisdictional waters and special aquatic sites. This includes the Navy Eelgrass Mitigation Bank management practice within San Diego Bay. This is consistent with the Southern California Eelgrass Mitigation Policy.<br><br>Adverse modifications to benthic habitat resulting in effects to EFH occur on limited bases during amphibious landing and beach construction activities within the Bravo training area. |

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| 81. | Dani S. Grady and Ralph J. Greenspan, Ph.D. | Local Economy – The Hotel Del is Coronado's major tourist destination, and it sits adjacent to the area where these exercises would be increased. The noise and smell from these activities would effectively ruin anyone's stay at the hotel, or at any of the nearby hotels. The repercussions for Coronado's standing as one of America's most desirable tourist and vacation destinations would be rapid and detrimental, and this would be felt as a permanent blow to the local economy and tax base. | The Socioeconomic section addresses any anticipated impact in the area of southwestern San Diego County, surrounding SSTC. As listed in Section 3.15.2.3.1, existing regional population and associated housing impacts, employment rates, and regional economy would remain unchanged. This includes the hotel, tourism, and restaurant commerce in southwestern San Diego County. |
| 82. | Dani S. Grady and Ralph J. Greenspan, Ph.D. | In short, we feel strongly that the proposed increase of Navy exercises on The Strand would be certain to have severe and long-term detrimental effects on the quality of life in Coronado, lasting well beyond the period of time in which the exercises actually occur. For this reason, we urge the City Council and Mayor to take a strong stand against such expansion of activities. | Your comment has been noted |
| 83. | Ralph Greenspan | My wife and I are writing to express our serious concern and opposition to the Navy's expansion of military exercises in Coronado. Our reasons include: human health, environmental concerns, impact on residential atmosphere, and impact on the local economy.<br>Our family is proud of the Navy and strongly supportive of our military, and we understand the need for expanded military training. Over the past few years, the level of war training exercises in Coronado has been increasing in both frequency and intensity. It is plainly audible from our home on Glorietta Blvd. We have been understanding of it up to now, but the noise levels we are experiencing currently are near the tolerable limit. We feel strongly that the place to expand such operations, however, is not Coronado, but the Navy's more isolated sites.<br>The noise at our home is not the only concern:<br>Human health -- One of the principal consequences of expanded war exercises in Coronado is noise pollution, which is well documented to cause hypertension, high stress levels, tinnitus, hearing loss, sleep disturbances, and harmful emotional effects. The radius affected by this noise pollution extends well beyond the area immediately adjacent to the site. Given the magnitude of the noise and the efficiency with which sound travels over water, this exposes the entire southern half of Coronado.<br>Another major effect is air and water borne pollutants, toxic debris, and shoreline contamination | As described in Section 2.1 of the EIS, possible alternate locations for training have been explored through criteria that were established to aid in the determination of the feasibility of a site or range for training. Due to a number of factors (training area availability, environmental constraints, proximity to base, etc.), other sites were determined to not be reasonable locations for training; please see Section 2.1.3. A specific example (for Camp Pendleton) is now provided in the EIS to illustrate why alternate locations are not feasible.<br><br>The EIS does analyze noise and its effect on wildlife (See Sections 3.11.2 Terrestrial Biological Resources Environmental Consequences; 3.12.2.2.1 Air Activities; 3.12.2.2.2 Pyrotechnics, Simunitions, and Blanks; 3.12.2.2.4 |

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| | | from toxic chemicals that are carried in or produced by exploded ordinance. These include toxins and carcinogens such as depleted uranium, mercury, and lead, as well as irritants and irritant produces such as titanium tetrachloride, red and white phosphorus. This is to name just a few of the associated chemicals known to be harmful to humans.<br>Loss of residential atmosphere -- Our troops are crucial to our safety and we support them, their training, and their families. Many of them and their families also live here in Coronado. Proper support requires that we provide appropriate separation between domestic living arrangements and war simulations. This is especially relevant given the widespread occurrence of PTSD and related disorders in returning service personnel.<br>Environmental impact -- The Navy's own EIS acknowledges that there will be a significance impact on marine ecology, including bioaccumulation of chemicals in the food chain, death from exposure to toxic chemicals and bomb blasts. In addition to direct physical harm, there is also the impact of noise on animal life in the reduction of usable habitat, which in the case of endangered species hastens the extinction process. The Navy's training use of sonar has already increased the deleterious exposure of marine mammals, and this expansion will further increase the burden of noise pollution on them.<br>Local economy -- The Hotel Del Coronado is Coronado's major tourist destination, and it sits adjacent to the area where exercises are increasing. The noise and smell from these activities would effectively degrade anyone's experience of staying in Coronado. The repercussion for Coronado's standing as one of America's most desirable tourist and vacation destinations would be rapid and detrimental, and this would be felt as a permanent blow to the local economy and tax base.<br>In short, we strongly feel that the the proposed increase of Navy exercises in Coronado would be certain to have serious and long term detrimental effects on the quality of life in Coronado, lasting well beyond the period of time in which the exercises actually occur. For this reason, we take a strong stand against such expansion. | Amphibious and Beach Activities; and parallel sections under the other Alternatives). Section 3.11.2 discusses the noise impacts on wildlife from current activities and from a proposed increase in these activities. The level of noise generated by these activities is not quantifiable above current background noise, including ocean surf, highway traffic, human-generated noise from surrounding neighborhoods, and current military flight patterns over the SSTC. Wildlife in the area has likely habituated to these noise patterns and, combined with the small area of impact compared to the larger area of available habitat, any noise-generated impacts would occur on a short-term and individual basis with no expected detriment to long-term population levels.<br><br>The noise analysis in the FEIS estimated sound levels along Silver Strand from various training activities, and determined that the intensity, frequency, and duration of these events were not sufficient to have substantial effects on human health. The FEIS also evaluated the potential effects of toxic substances from expended training materials and effects on water quality.<br><br>The Navy recognizes its proximity to surrounding communities and has attempted to structure its training activities to achieve operational readiness while minimizing any potential impact to the surrounding area. In this manner, the Navy is adding additional mitigation measures for alerting the adjacent communities regarding events which may be considered intrusive.<br><br>The EIS addressed socioeconomics and potential impacts associated with the Navy's Proposed Action. The Navy has been conducting training activities on the Silver Strand for 60 years; the areas of activity are shown in Figure 1.2. These areas will not change with implementation of the Proposed Action and as listed in Section 3.15.2.3.1,the increase of activities in these areas will not be appreciable by tourists or the local economy because the Navy is an integral part of the |

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| | | | Silver Strand. The activity increases in these areas will not have a considerable effect on the local economy and tourism industry. |
| 84. | Reiko Gregory | As a native San Diegan of over 50 years and one who has enjoyed the serenity of Silver Strand from Coronado to Imperial Beach for many years, especially as a natural habitat for many birds and other animal species, I am appalled that the Navy is requesting to expand its activities there. I call on all those in power to keep the Navy activities out of these areas. Save our natural habitat, save the Strand. We don't need more military buildup. We need to preserve our peaceful natural habitats and our beautiful environmental surroundings. | The Navy recognizes its proximity to surrounding communities and has attempted to structure its training activities to achieve operational readiness while minimizing any potential impact to the surrounding area and habitats. As indicated in Sections 3.11 and 3.12 of the FEIS, the Navy has developed and will continue active management of the biological resources of the base. The Navy has developed mitigation measures for activities that may cause an impact to the environment or surrounding area and has presented these in Chapter 5 of the FEIS. |
| 85. | Steven Gregory | As a San Diego resident for more than 30 years, I have enjoyed Silver Strand and the peace that it offers. Increasing military activity in this location would be harmful both from an environmental standpoint and aesthetic standpoint. Silver Strand is not only a resource for San Diego residents, but for tourists as well. And while the EIS does address the impact the increased military activities would have on terrestrial animals, the full impact is never certain, and the impact on aquatic flora and fauna is unknown and therefore a "risk" that should not be taken. I fully understand the need for training, but not at the expense of the environment and people. The military would be better served increasing moral, cultural, and ethical training, which would create a more enlightened military, rather than one that knows how to kill. I call on the people in charge to not increase military activity in this area. Our dwindling resources do not need to come under attack from our own military. | While the full impact of the military activities may not be entirely certain, the Navy has attempted to quantify, by using the best available science, the amount of impact that these activities would have. Sections 3.7 through 3.10 of the EIS discuss and analyze these impacts and any mitigation thereof. |
| 86. | Robert Hrodey | Having visited the Coronado area several times over the years, we always enjoy the presence of the military and their training in the area. It reminds us of where we are, how we got there and what it takes to remain free to travel about. If the folks upset with additional training of our armed forces to allow them to better perform their duties, let THEM (the protesters) take up arms and put it on the line for us. That should settle the debate! | Your comment has been noted. |

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| 87. | Carol Humphrey | As a resident of Coronado, I am writing to express my support for the Navy exercises as I am profoundly grateful for all the military does. | Your comment has been noted. |
| 88. | John Hunter | I write because I am tired of others speaking for me. I have lived about 55 feet from the base since the summer of 2002. The base has never been a problem. The problems in the neighborhood are not related to the base. Please contact me if you wish to discuss what I feel are ethics violations regarding complaints to your expansion. Go for it! | Your comment has been noted. |
| 89. | Miriam Iosupovici | Choosing to do this in one of the most beautiful beach environments in the US, close to major population centers that need a peaceful resource, seems a poor choice. | As described in Section 2.1 of the EIS, possible alternate locations for training have been explored through criteria that were established to aid in the determination of the feasibility of a site or range for training. Due to a number of factors (training area availability, environmental constraints, proximity to base, etc.), other sites were determined to not be reasonable locations for training; please see Section 2.1.3. A specific example (for Camp Pendleton) is now provided in the EIS to illustrate why alternate locations are not feasible. Additionally, the Navy recognizes its proximity to surrounding communities and has attempted to structure its training activities to achieve operational readiness while minimizing any potential impact to the surrounding area. |
| 90. | Miriam Iosupovici | We already have problems with pollution in this area. What will the effect be on the military if they contact illnesses during training? What will increased pollution effects be from training vessels? | The effects of the Proposed Action, including the effects of training vessels on air quality as well as ocean and bay water quality, are addressed in Section 3.3 and 3.5 of the FEIS, respectively. Because the purpose of the EIS is to address the effects of the Proposed Action on the public and the environment, rather than on itself, the effects of ocean water quality on military trainees are not addressed in the FEIS. The Navy takes the health and fitness of its personnel seriously, however, and closely monitors the conditions under which training activities are conducted. |

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| 91. | Miriam Iosupovici | I simply don't trust that the noise levels will NOT be intolerable at the increased level proposed. I don't want to hear the echo of bombardment PERIOD. What ab the fact that we have many vets living here. Will there be increased PTSD responses to the sounds? Nothing I have read discusses this potential issue, one I am aware of as a mental health professional.<br><br>Helicopter overflight noise already impacts my environment at present levels. Increases predicted will be intrusive. We have no idea what the impact will be on birds utilizing the Tijuana Estuary, part of the Pacific Flyway, despite the EIS document's assertions. | The Proposed Action does not include bombardments. Other types of military training sounds (e.g., small arms fire) could be audible in nearby portions of Imperial Beach. While impulsive noise events clearly play a role in post-traumatic stress disorder incidents, so do a variety of other factors. Given the number of variables involved, it is not possible to describe the relationship of SSTC training activities, if any, to post-traumatic stress disorder incidents in Imperial Beach.<br><br>Helicopter overflights of Imperial Beach and the Tijuana Estuary consist of pilots transiting from NASNI to NOLF, or performing touch-and-go's at NOLF, for training activities unrelated to the SSTC training activities addressed in the FEIS. Helicopter flights in support of SSTC training activities depart from NASNI, transit over water to the north of Imperial Beach, and approach and depart from the training beaches with as little overflight of land areas as possible. |
| 92. | Miriam Iosupovici | The Pacific Flyway is under this area. Over 350 species of birds may be impacted, assertions to the contrary that they would not be. Imperial Beach has a difficult economic situation and visitation to this area due to bird life is one of the few income generating parts of our economy. Why would birdwatchers choose to come to an area where they are forced to watch birds with an incessant sound of helicopters, even assuming this wouldn't alter migration patterns (an assumption that strains credulity)<br><br>The Silver Strand plan to increase training will inevitably negatively impact the nesting and fledgling of Least Terns due to increased foot and vehicle traffic. This Least Tern project has been successful until now. Why should we believe this EIS will be enforced after it is approved? | The most important shorebird areas are avoided (salt marsh, mudflats, salt pond), and many minimization measures are implemented in compliance with Migratory Bird Treaty Act and Endangered Species Act. Salt marsh, salt pond, and mudflats are nearly completely avoided. Impact to birds is expected at low levels, but site improvements are also planned where birds can be protected. With regards to nesting terns/plovers, the Navy is required under the Endangered Species Act to implement the terms and conditions of the final Biological Opinion. Also, the Navy will be required under the Biological Opinion to re-initiate consultation with USFWS if the populations of terns or plovers at Naval Base Coronado decline below current baseline nesting levels. Please see the analysis of impacts to Migratory Birds in Section 3.12. The Navy is committed to work with the Port to fund surveys for waterfowl and shorebirds throughout San Diego Bay every 3 years. Baywide surveys follow consistent protocol and will be used to document future changes in bird abundance, diversity, and use of the Bay. Section 3.12.1.2 summarizes over 500,000 |

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| | | | observations of San Diego Bay birds by species, location, abundance, diversity, and bird group. |
| 93. | Rina Kelley | On the occasion of the meeting this date on your proposed expansion of activities at your SSTC Complexes and associated EIS I want to take the opportunity to inform you about your lack of attention and dangerous disregard of your property in Imperial Bch which has created a dangerous condition for years.<br><br>Your misuse of the word "Stewardship" in your EIS to expand training activity in your SSTC may serve the Fairy Shrimp and Snowy Plover well, but your neglect for the welfare of the inhabitants of my City who have been subjected to your dangerous threatening activity for years is deplorable.<br><br>You are hereby put on notice that first, your steel Seawall outside of the Camp surf fence at the Beach has huge holes and serves no purpose except to attract children and has become a serious hazard to the safety and welfare of all of us. Its jagged rusted steel rim and bottom are hazardous and constitute a daily accident-waiting-to-happen for the numerous children who climb upon it both within and without the confines of Camp Surf. Since these children have little supervision anyway, you must take control and remediate this problem. This rusty steel nuisance has fallen in such disrepair that it has not served a purpose for at least ten years, and I fear for my own as well as the safety of others whenever I approach it to get down to the beach area. Would you have us wait another ten years for you to remediate and remove it. Hopefully not, now that you are formally on notice with Legal effect. | The Navy is now aware of your concern about condition of Camp Surf fence. This FEIS is intended to analyze the training activities occurring at SSTC and does not address the condition of preexisting structures. However, NBC Planning prepared a planning document (DD Form 1391), dated 28 May 2009, for FY 2010 Special Projects Program for repair seawall near Camp Surf |
| 94. | Rina Kelley | Your personnel--police and others entering the camp at Antenna Station (SSTC South) often speed down Carnation avenue when your personnel should instead be using Silver Strand St in mornings which goes directly to their station. Please post signs on your side of Carnation, the North side, with warnings to slow down as numerous children and people frequent that area to the corner going to and from the Beach. | Navy is responsible for traffic on their controlled land. Once personnel leave the base, they are subject to Department of Transportation regulations. Various speed and traffic control measures would be the responsibility of the City of Imperial Beach. Additionally, due to your comment and other similar comments, the Navy is considering implementing increased signage or message board requesting Navy personnel to obey all posted speed limits, keep radios turned down, etc., as personnel leave the base. |

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| 95. | Rina Kelley | I feel like I live in a War Zone in summer when SEALS shoot guns and explode munitions within SSTC South East. Could you please put a time limit on this activity so I can sleep at night and provide a schedule of upcoming events so I can leave town. Also, your planes from NASNI fly late overhead doing exercises in violation of agreements you have made with our Congressional and Civic leaders. Please don't allow this activity to continue past 9PM and afford us a timetable so I can leave town with my animals and children. Your YMCA Camp is a nuisance, continuing to play loud music and solicit screaming and yelling well past the 9PM agreed-upon time. Please have this activity cease. (Read the Police Report on your Camp Director, Mr Thompson who assaulted my friend a Navy SEAL's wife next door when she went over to tell him to turn down the music and was 8 months pregnant and later lost her baby). I feel forced to sell my home which I must further depreciate by declaring in Real Estate papers that I live in a War Zone due to the above activity which threatens and annoys constantly in Summer months. A former Air Force Officer, I cannot begin to understand how the Navy can be allowed to perpetrate such damage on a Community when my fellow Air Force personnel would never have dared. Why don't you go to Corregador or the Phillipines where you can conduct your endless and mindless training missions. General MacArthur drove out the Japanese over there so they can't hurt you anymore- Unless you drive a Toyota. Or better still, Puerto Rico where the Air Force goes, or Haiti. In short I protest this EIS which, in the aggregate, continues to wreak more havoc on my Community. And I have no doubt that in a few years, with the perverbial Camel's Nose already in the door, you will be sending invitations to a like event. | The Navy recognizes its proximity to surrounding communities and has attempted to structure its training activities to achieve operational readiness while minimizing any potential impact to the surrounding area. As listed in NBCINST 3502-1, the Navy does notify local public safety agencies and city governments about specific upcoming hazardous or high-visibility night training events so that the local governments may disseminate the information to their communities. Additionally, due to your comment and other similar comments, Navy is investigating additional means of alerting the adjacent communities regarding events which may be considered intrusive as well as posting signage and controls regarding public access to the beaches.<br><br>No fixed-wing aircraft are included in the Proposed Action. The helicopters associated with training operations at SSTC-S do not overfly Imperial Beach. The typical flight pattern in support of SSTC-S inland training consists of an approach along the San Diego Bay flight corridor, turning west on the southern side on Emory Cove, and beginning a descent into SSTC-S, targeting the drop zone to the west of Bunker 99 on the northern end of SSTC-S. Once established in this approach, the helicopters remain at 500 feet over residential neighborhoods and do not reduce their elevation to 150 feet until they are over SSTC-S. On departure, the helicopters ascend to the west over the Pacific Ocean.<br><br>As described in Section 3.6.1 of the FEIS (Affected Environment), a substantial amount of daytime and nighttime helicopter activity occurs in the vicinity of SSTC that is not associated with SSTC training activities. Nighttime helicopter transits from NOLF and NASNI, and to and from SSTC-S, occur only over water. The only helicopters overflying residential areas at night are Department of Homeland Security or U.S. Coast Guard. Information on these flight patterns, as well as the percentage of sorties associated with training at SSTC, has been added to Sections 2 and 3.6 (Acoustic |

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| | | | Environment) of the SSTC FEIS.<br><br>As described in Section 2.1 of the EIS, possible alternate locations for training have been explored through criteria that were established to aid in the determination of the feasibility of a site or range for training. Due to a number of factors (training area availability, environmental constraints, proximity to base, etc.), other sites were determined to not be reasonable locations for training; please see Section 2.1.3. A specific example (for Camp Pendleton) is now provided in the EIS to illustrate why alternate locations are not feasible. |
| 96. | Ann S. Kennedy and General Edward Baumer | I have learned that the Department of the Navy is planning on increasing the levels of training at the Silver Strand Training Center. I hope that you can provide the level of quiet enjoyment that I have experienced for the last 8 years as I am a full time resident. | The Navy recognizes its proximity to surrounding communities and has attempted to structure its training activities to achieve operational readiness while minimizing any potential impact to the surrounding area. The Navy has developed mitigation plans for activities that may cause an impact to the environment or surrounding area and has presented these in the EIS. |
| 97. | Celeste Kennedy | I am opposed to the increase in Naval Training Exercises at the Silver Strand Complex Naval Training Area. We are long time residents and homeowners in Coronado and we have witnessed the increase in traffic, noise, and pollution of this gem of a town which has the U.S. Navy as its neighbor.<br>While not all negative environmental impacts are attributable to the Navy, the fact is that many of them are, and when you combine them with the already overwhelming levels of noise, traffic, air and water pollution, it makes no sense to increase it all by ramping up Navy Training Exercises on the Strand.<br>Helicopter flights down the bay are very noisy and bothersome. The exhaust which we can see coming out of those machines is certainly unhealthy. Increasing their activity is unacceptable.<br>The gunfire we hear with the war games and training is a frightening and bothersome sound for civilians such as ourselves. Please do not increase the amount of gunfire we must hear. I imagine the amphibious craft are gross polluters of the sea as well.<br>While it is admirable that the Navy has participated in the Least Tern preservation efforts, we would like to see efforts towards preservation of clean air, water, and peace and quiet as well.<br>Coronado has grown over the years and has become densely populated with the addition of the Coronado Shores and Cays residential projects. All areas of Coronado, as well as all areas of the southern San Diego bay and coast, are affected by Naval training exercises. | The Navy strives to be a good neighbor and analyzed all training activities at SSTC with respect to applicable air and water regulations. As described in Section 2.1 of the EIS, possible alternate locations for training have been explored through criteria that were established to aid in the determination of the feasibility of a site or range for training. Due to a number of factors (training area availability, environmental constraints, proximity to base, etc.), other sites were determined to not be reasonable locations for training; please see Section 2.1.3. A specific example (for Camp Pendleton) is now provided in the EIS to illustrate why alternate locations are not feasible. |

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| | | Please do not increase any of it, as we are already enduring way too much.<br>Perhaps consider Camp Pendleton as a spot to increase the training exercises. It provides a vast coast and inland area which affects far fewer civilian residents. | |
| 98. | Gary Klopp | As a SBC and active duty member of NSW since 2000, I feel the need to convey some of my concerns. I do sympathize with the balancing act of training our warriors economically, efficiently, and to the standard that our country and NSW warriors require and deserve. I fully understand that our countries security is at stake; however, the amount of training and location of that training must be balanced with the surrounding communities and environment.<br><br>Many studies have proven that people who live near airports have a much higher than national average of cancer due to all the exhaust and fuel that is released into the air. Under the proposed plans, helo flight hours would increase dramatically certainly affecting the air quality surrounding Imperial Beach and outlaying areas.<br><br>Camp Pendleton offers large training areas to include military air space, small and heavy weapon ranges, beach access for amphibious operations, ammunition storage, helo landing sites, and various supporting facilities and infrastructure. This area is much larger than the limited area on the strand and there is much more open acreage between San Diego and San Clemente. Although not as convenient to NAB Coronado or the Advanced Training Center, it is close and would meet the "balancing act" that I stated earlier. The impact at Camp Pendleton would be much less felt than here on the strand. | The Navy recognizes its proximity to surrounding communities and has attempted to structure its training activities to achieve operational readiness while minimizing any potential impact to the surrounding area. As described in Section 2.1 of the EIS, possible alternate locations for training have been explored through criteria that were established to aid in the determination of the feasibility of a site or range for training. Due to a number of factors (training area availability, environmental constraints, proximity to base, etc.), other sites were determined to not be reasonable locations for training; please see Section 2.1.3. A specific example (for Camp Pendleton) is now provided in the EIS to illustrate why alternate locations are not feasible.<br><br>Additionally, the Navy has analyzed the emissions from helicopter flights associated with training activities at SSTC in the EIS and has found the emissions do not exceed current regulatory limits |
| 99. | Gary Klopp | As a SBC and active duty member of NSW since 2000, I feel the need to convey some of my concerns. I do sympathize with the balancing act of training our warriors economically, efficiently, and to the standard that our country and NSW warriors require and rightfully deserve. I fully understand that our countries security is at stake; however, the amount of training and location of that training must be balanced with the surrounding communities and environment.<br><br>With the proposed increase of helo operations, noise pollution would increase dramatically affecting ALL citizens of Imperial Beach, especially those like myself and our family that live close to the beach and existing training areas. If the amount of helo operations and training that you are proposing already existed, then certainly we would have no right to complain, but we bought our home and have lived here since 2002. We chose to make this our home and to retire here because we like the peacefulness and small town feel of I.B. We enjoy listening to the sound of breaking waves and wildlife, not the sound of helos. If we wanted to hear flight ops all the time, we would have bought our home by the airfield. It is currently 2010 and one plane has | The Navy recognizes its proximity to surrounding communities and has attempted to structure its training activities to achieve operational readiness while minimizing any potential impact to the surrounding area. As described in Section 2.1 of the EIS, possible alternate locations for training have been explored through criteria that were established to aid in the determination of the feasibility of a site or range for training. Due to a number of factors (training area availability, environmental constraints, proximity to base, etc.), other sites were determined to not be reasonable locations for training; please see Section 2.1.3. A specific example (for Camp Pendleton) is now provided in the EIS to illustrate why |

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| | | flown directly overhead and 3 helos have passed by while I type this. I do not believe it is fair that we should have to suffer through increased noise when other training areas exist that would meet the Navy's NSW training requirements.<br><br>Camp Pendleton offers large training areas to include military air space, small and heavy weapon ranges, beach access for amphibious operations, ammunition storage, helo landing sites, and various supporting facilities and infrastructure. This area is much larger than the limited area on the strand and there is much more open acreage between San Diego and San Clemente. Although not as convenient to NAB Coronado or the Advanced Training Center, it is close and would meet the "balancing act" that I stated earlier. The impact at Camp Pendleton would be much less felt than here on the strand.<br><br>My wife and I sincerely hope that you will find alternative training sites that already exist that can handle a larger capacity of training that will not be nearly as detrimental to a small beach community such as I.B. which already faces so many challenges in these tough economic times. | alternate locations are not feasible.<br><br>No fixed-wing aircraft are included in the Proposed Action. The helicopters associated with training operations at SSTC-S do not overfly Imperial Beach. These helicopters depart from and return to NASNI. They approach the training areas from offshore, approaching and departing from the training areas over water. |
| 100. | Gary Klopp | Although Imperial Beach is an extremely unique small town beach community, we continue to struggle economically for several reasons: Our proximity to the Mexican border and Tijuana, degraded water quality due to runoff and pollution from Mexico, lack of small business infrastructure, school ratings, and past stigmas are just a few of those reasons. Even with all the challenges I.B. faces, we have a lot in our favor, and every year brings more and better change albeit slowly. If you push forward with the proposed increases of training, helo operations, and live fire, you will certainly hinder this city and the people of I.B immensely. This area, and the surrounding area just can't handle the volume of increased training that you are proposing. Property value will be affected and home ownership will decrease. It will be even harder than it already is to attract new families to our town with all the noise and disruption that will certainly be experienced if your training proposals get approved. You currently aren't conducting training in front of the Hotel Del or the area between the hotel and North Island, or even the beaches on North Island, why I.B.? Because we don't hold the clout and financial means as a community that Coronado does? Other training areas already exist that would meet the Navy's NSW training requirements. Spare I.B. | The SSTC training areas have been used by the Navy for over 60 years. Increases in training activities associated with the Proposed Action and alternatives are not expected to disrupt normal business operations or affect property values in southwestern San Diego County. The analysis presented in the EIS in Section 3.15.2.3.1 determined that regional and community employment, housing, and population growth would not be affected by the Proposed Action. Currently, training is conducted on the rocks in front of the Hotel Del Coronado as well as all training areas discussed in Chapter 2. |
| 101. | Gary Klopp | Many studies have proven that people who live near airports have a much higher than national average of cancer due to all the exhaust and fuel that is released into the air. Under the proposed plans, helo flight hours would increase dramatically certainly affecting the air quality surrounding Imperial Beach and outlaying areas. | The Navy has analyzed the emissions from helicopter flights associated with training activities at SSTC in the EIS and has found that neither the current nor future emissions exceed current regulatory limits |

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| 102. | Gary Klopp | Again, having been a member of the NSW community since 1990 and a NSW operator since 1994, I have seen a lot. Although the Navy has taken big steps in recent times to address environmental concerns, and as a nation, we have become much more aware of our environment and how our actions affect everything around us, the amount of detrimental effects on the environment along the silver strand training areas will increase drastically. Unused ammo (blanks) get dumped over the side. Food wrappers, MRE packaging, various operating items (550 chord, line, rubber bands, night sticks, etc) all get mixed into the environment. Shell casings, links for the ammunition, fuel oil from the zodiacs, exhaust from the craft and air assets, batteries, etc. Even with the best of intentions, all this is unavoidable. Men get wet, cold, hungry, tired, mentally and physically exhausted, and everything always goes wrong at the worst possible time. Believe me, I know from experience! The precious beaches that encompass and surround these training sites provide endangered habitat and wildlife refuge and the ability to recreate. These species of animals and plants struggle for survival everyday in a world that continues to build and shrink their natural habitat. The noise pollution, air pollution, water pollution, and human pollution that is simply unavoidable during the types of amphibious operations that will be conducted with alarming frequency will only continue to make the environmental concerns bigger. Along with all of these issues, is the simple fact that people live here to enjoy the beach, wildlife, and ocean. Increasing the training that you are proposing does nothing to benefit anyone or anything in I.B or the Silver Strand. Please use training areas that already exist that can better support the large volume of training that you are proposing. | Most of the training materials used at SSTC are non-hazardous, or are rendered non-hazardous when they function as designed (e.g., blanks). Trainees collect and remove expended materials to the extent practicable at the conclusion of their training events. Very rarely, energetic items may not function as designed, resulting in their temporary presence until promptly retrieved by Navy personnel. The incidence rate of expended items that would pose a risk to the public is so low that a public education and outreach program is not warranted. The species management explained in this EIS establish habitat areas within the training areas to protect species. |
| 103. | James M. Knox | 3.1.2.3.2 Beach Activities<br>How many more activities and restrictions will take place over and above what is done now at SSTC-S? | Information on activities and restrictions is listed in Section 2.2.3 as well as in further detail in Section 3.1.2.3.2. Listing the exact number of activities that will take place at SSTC-S is not possible given that many activities could also occur at SSTC-N and NASNI. An additional sentence has been added to 3.1.2.3.2 to indicate as such. Tables 2-1, 2-2, and 2-3 in Section 2 of the FEIS list the training activities and areas where training activities may be scheduled. |
| 104. | James M. Knox | 3.5.1.4.2 &3.5.1.5.2 Pacific Ocean<br>Contaminants<br>Your report states that most of the contamination of the area is cause by sewage from the river mouth and/or the South Bay Ocean outfall. Storm water runoff has a relatively minor influence on local water quality.<br>Table 3.5-5<br>Will increased training at SSTC-S cause more contaminates to reach the ocean by storm water runoff. Rain events occur mainly in the winter when ocean currents in the area are north to south. Were seasonal changes in ocean water movement taken into account when the findings on contaminants were formulated?<br><br>3.5.1.5.2 Pacific Ocean<br>Silver Strand State Beach does have day and overnight use numbers that were not included in this report. I would question the conclusion that the information presented is not representative | The potential for increased concentrations of pollutants in waters along the Silver Strand under the Proposed Action is negligible. Seasonal changes in littoral currents along the Silver Strand may affect the dispersal pattern of pollutants from the Tijuana River or from water treatment plant outfalls. Section 3.5.1.4 of the FEIS indicates that contaminants entering the ocean during storm events are generally conveyed via impervious surfaces. For contamination to occur, the contaminants must be present at the surface during a precipitation event, and the surface must be relatively impervious. Residues from the use of flares and smoke grenades constitute the majority of contaminants from training |

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| | | of the use of the municipal beach in Coronado. The report, in other sections, extrapolated information that was used for conclusions without complete numbers. Navy recreational areas (Gator Beach and Fiddler's Cove) should not be included as recreational opportunities. They have restricted access and are not open to the general public. | at SSTC. These materials are widely dispersed over the training areas at very low concentrations. Wind erosion of sand and loose surface soils likely results in further dispersal of these materials. When precipitation occurs, most of the rainfall - along with any traces of these residues - infiltrates the soil or sand, and does not run off into the ocean.<br><br>The EIS states that the use numbers for visitors to SSSB are not representative of the actual use of the ocean waters adjoining the beach. In other words, there is no known correlation between the number of visitors and: (a) the number of individuals that enter the water, (b) how far from the beach those water users travel, (c) the time those individuals spend in the water, and (d) the times of day this use occurs.<br><br>W/re recreational use of SSSB, this issue has been addressed in 3.1 Land Use, and any implications for Pacific Ocean water use will be carried over into the 3.5 Water Resources section. |
| 105. | James M. Knox | 3.6.1.5.2 & 3.6.1.5.3<br>Will LCACS be used on both Purple 1 and Purple 2?<br><br>3.6.1.6<br>The Navy should also notify residents. The sound of M16's and 50's along with concussion grenades without notice very late at night or early in the morning can lead to apprehension if a person does not know that training is taking place. Explosions and small arms fire are easily detectable from my home, and loud enough to wake me up.<br><br>Table 3.6-5 Helicopter Pass-by Sound<br>It has been my experience that the Helicopters used during training are, during many of the evolutions, closer then stated in the table.<br><br>3.6.2.3.1 Traffic on ST-75 (local roads)<br>Silver Strand Blvd in Imperial Beach leads to the main gate of the South Complex. How much will traffic increase on this residential street? How will this increase in traffic affect the acoustical environment of this residential neighborhood?<br><br>3.6.2.3.2<br>New training activities will increase helicopter use. (TRAP) (N9, Table 2-2) Disagree with conclusion that noise level will not change. Each flight is a separate event, with individual | LCACs can train on Purple 1 and 2, but are typically trained on Green, Red and/or Blue.<br><br>The Navy is currently discussing alternate means of notification than those already described currently in Section 3.6.1.6.<br><br>Baseline traffic volumes on Silver Strand Blvd. are discussed in Section 3.14.2.2.1 and increases in traffic volumes on Silver Strand Blvd. under Alternative 1 are discussed in Section 3.14.2.3.1. The Proposed Action would increase military training traffic along Silver Strand at the entrance to SSTC-S from about 147 to about 249 round trips per day, or by about 102 round trips. Residents would notice a 69-percent increase in vehicle pass-by noise. As discussed in Section 3.6 of the Final EIS, however, the additional vehicles would increase traffic noise along the street by less than three decibels, which is a barely noticeable change in the average hourly sound |

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| | | consequences regarding sound. Weather, temperature, wind direction, and pilot skill all contribute to each event. Suggesting that the helicopters will always be in their assigned flight lanes without data is an assumption. The helicopters get out of their flight lanes many times (personal observation). Training evolutions may have variations that are not foreseen. This fact needs to be taken into consideration when making conclusions. More use equals more sound in the adjacent residential areas. Citing the ambient sound of the surf supplies no useful data without knowing; the size of the surf, the direction of the swell, the direction and strength of the wind, and the tidal level. None of this information is contained in the table. | level.<br><br>The reference to the sound of the surf masking the sound from distant training events has been deleted from the Final EIS. With regard to helicopter sound, the analysis indicates that, while the number of helicopter sorties would increase substantially under Alternatives 1 and 2, the increased frequency of short-term sound exposures from increased helicopter pass-bys would not be sufficient to noticeably change the hourly average sound level at any one off-installation location. Because of the logarithmic nature of sound; a doubling of sound energy results in only a three-decibel increase, which under typical conditions is barely discernable. The analysis of helicopter sound is based upon broadly defined flight paths, consistent with a normal degree of variability introduced by pilot discretion, weather, time of day, and safety concerns such as other aircraft.<br><br>The typical flight pattern in support of SSTC-S inland training usually consists of an approach along the San Diego Bay flight corridor, turning west on the southern side on Emory Cove, and beginning a descent into SSTC-S, targeting the drop zone to the west of Bunker 99 on the northern end of SSTC-S. Once established in this approach, the helicopters remain at 500 feet over residential neighborhoods and do not reduce their elevation to 150 feet until they are over SSTC-S. On departure, the helicopters ascend to the west over the Pacific Ocean. |
| 106. | James M. Knox | 3.6.2.3.4 Amphibious Training<br>Increase from 10,000 to 13,800 LCAC 8 to 40 (increase of 5 times current) I must disagree with the conclusion. While the average sound during each evolution may not increase the amount of times of discomfort will increase by a factor of 5. (40 instances verses 5 instances). Each time an LCAC lands is an individual event with individual consequences regarding sound Depending on wind conditions I can easily hear the LCACs when they are used on the purple beaches at the north end of the South complex.<br><br>3.6.2.3.5 Munitions | LCAC landings associated with the Craft Landing Zone would remain the same under Alternatives 1 and 2 as under the No Action Alternative (4 per year). However, LCAC landings associated with Amphibious Raid activities would increase from 4 per year to 36 per year. Thus, overall, LCAC landings would increase from 8 per year to 40 per year. Because these activities would be distributed over time and likely occur at different locations along the beach, the increase in LCAC sound at any one receptor would not increase proportionately. |

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<tr><td></td><td></td><td>Sound generating activities will increase by 48%. How much of this 48% will be at the South complex and at what times of the day or night?<br><br>3.6.2.3.7 Summary Alt 1<br>Finding of no adverse effects. The last paragraph states the sound levels would increase during all days and hours of the week with no notice to residents. I would disagree with the conclusion of no adverse effects. Residential areas will be affected.<br><br>3.6.4 Table<br>Why were no residents of Calla or Citrus Avenues interviewed?<br><br>Table 3.6-11 Summary of Effects<br>Mitigation: Please add notifies residents and local emergency personnel.</td><td>Additionally, the audibility (ability to hear) of an event does not equate with discomfort.<br><br>See response to comment #1 regarding proposed increases in sound-generating activities. The distribution of activities between day and night is variable, but most training activities would occur during daylight hours on weekdays.<br><br>Last paragraph does not conclude that there would be no adverse impacts nor does it indicate that there would be "no notice to residents". The paragraph simply states that acoustic sources will generate noticeable noise on weekdays and infrequently at night or on weekends.<br><br>Interviews were only done near locations where sound level measurements were taken for correlation purposes.<br><br>The Navy is currently discussing alternate means of notification than those already described currently in Section 3.6.1.6. This table has not been modified.</td></tr>
<tr><td>107.</td><td>James M. Knox</td><td>3.14.1.4.2 Palm Avenue & 3.14.1.4.3<br>The description is wrong. To continue West on Palm after the four way stop at 3rd street you must be in the left hand lane. The right hand lane on Palm is right turn only. This causes large backups at times at the four way stop and also makes it very hard to turn left onto Palm from Silver Strand Blvd. Palm Avenue has been restriped for two lanes West of Third street until Seacoast Drive. Rainbow Drive is striped for two lanes. What counting devices were used and when was traffic counted by SANDAG?<br><br>3.14.1.4.4<br>The entrance to Silver Strand Blvd. from Palm Avenue has changed in the last year. It is now a sharp right hand turn to a narrow road that slowly winds left and widens. Why was no study to measure ADT done by the Navy?<br><br>3.14.1.5.2 SSTC-S<br>The Camp Surf entrance is on the West side of Silver Strand Blvd, half a block from the entrance gate to the Training Complex.<br><br>3.14.2.2.2 Ground Transportation<br>Last paragraph: No data on Silver Strand Blvd. to support conclusion.<br><br>3.14.2.3.1<br>249 trip in means 249 trips out for a total of almost 500. This is a significant increase in traffic</td><td>The ADT of Silver Strand was taken from the County of San Diego Department of Public Works, 1999. Public Road Standards. Adopted July 14, 1999. This is a public road and the ADT was calculated for all traffic, which would include any military traffic. FEIS used these ADT amounts to determine the contribution to overall traffic on public roads from military activities. In lieu of funding an additional ADT study, this was assumed to be an appropriate method for determining military contribution to overall traffic.<br><br>As previously discussed, traffic volumes were not available for Silver Strand Blvd., the roadway that provides access into SSTC-S. However, based on the County of San Diego Public Road Standards, typical roadway capacity for a residential street operating at a LOS C is 1,500. The assumption is that without an ADT, the roadway is operating at this typical capacity. Section 3.14.2.2.1 states that the current level of trips associated with military activities is 147 into SSTC-S. As stated in Section 3.14.2.3.1, the increase in ADT from the No</td></tr>
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| | | on a short residential street.<br>3.14.3 Mitigation Measures<br>I would suggest opening the North Gate for groups of over three vehicles to help reduce the approximately 500 daily trips to the South Gate on such a short residential street as Silver Strand Blvd. | Action Alternative and the Proposed Action will be 102 (147 to 249). This will increase the overall ADT (assuming operation at normal capacity for a residential street at "C") to 1602, which represents a 6.8 percent increase in ADT.<br><br>The comment assumes that a "trip" is one way, when ADT is actually a total traffic count. 249 is NOT 249 trips in and 249 trips out, it is just 249 total trips. The current level of trips associated with military activities is 147. The increase in ADT from the No Action Alternative and the Proposed Action will be 102. This will increase the overall ADT (assuming operation at normal capacity for a residential street at "C") to 1602, which represents a 6.8 percent increase in ADT.<br><br>Regarding Navy personnel access into SSTC-S, based on your suggestion, the Navy is researching the possibility of using the north truck gate for ingress/egress into SSTC-S. |
| 108. | James M. Knox | 4.2.1 Table 4-1<br>Why does sand need to be removed and relocated? Where is the sand that is removed being relocated?<br><br>4.3.6<br>Sounds associated with redevelopment in Imperial Beach have nothing to do with sounds that come from training activities in the South Complex. | Due to erosion, sand is blown up the beach of SSTC-S and is caught by the SSTC-S perimeter fence. The sand that is caught creates a dune which makes the fence passable. This creates a base security issue and must be tended to on a regular basis. The sand is relocated to areas on base where beach replenishment is needed, as defined by the Naval Base Coronado Integrate Nature sources Management Program.<br><br>All sounds from all sources within the region of influence have been analyzed and considered in the cumulative impacts analysis within Table 4-1. The Navy analyzed the noise contribution that the Proposed Action would have in light of all other sources in the area. |

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| 109. | N.J. Kuebler | I would encourage the EIS to do a more thorough study of the traffic impact on the Silver Strand/Hwy. 75. I read the interview Delphine Lee did with KPBS in which she commented that current traffic is 1% of the throughput there.<br>My address is a "rim" home in the Coronado Cays residential area. Weekdays, I can tell what time it is from the volume/noise of traffic, in spite of double paned windows and two useless "sound walls" along the perimeter of the complex here. | The Navy has reviewed applicable traffic studies and has presented their results in the respective section of the EIS. While there is an abundance of traffic along the Silver Strand / Highway 75, it should be noted that the statement being referenced only accounts for traffic that is associated with the training activities at SSTC. The impact of that traffic (only associated with the SSTC training activities) relative to the overall traffic on area roads is presented in the Section 3.14 of the EIS as well as the cumulative section of the EIS. Currently, intersections and roadways within the Region of Influence typically experience an acceptable LOS. Although the intersections at Gates 1 and 2 experience unacceptable LOS, traffic related to the Proposed Action represents less than 1 percent of the morning volume and less than 2 percent of the evening traffic at these intersections. |
| 110. | N.J. Kuebler | I believe the residents of Coronado, Imperial Beach and the Silver Strand areas could use more information published or mailed in regard to this EIS study. I ran across terms in online pages regarding the study such as "elevated causeway system", "fluid transfer system", "new platforms and equipment", and "new training". Without knowing what those are, how can we consider the impact they might have?<br>The full pdf document would not download for me, and there are many who cannot access it at all or make it to the public meetings. I hope you will use your resources to make the information we need more available. | The terms in question are defined in full in Section 2 of the EIS as well as Appendix B. The potential impacts of training activities using these platforms or equipment is analyzed in respective sections of the EIS, which is also available at both the Coronado and the Imperial Beach public libraries. |
| 111. | Stephen LaPalme | Your comment dropdown list should allow you to comment on several issues since many are interconnected. I am VERY MUCH AGAINST the military increasing it's activities and foot print in the silver strand area. If anything they should be considering downsizing and eventually closing the bases since they are incompatible with domestic and social harmony. Any considered activities should be relocated to the Camp Pendleton base due to it's substantial land area and distance from populated locations. Military drones and the removal of personnel from Afghanistan and Iraq make this increase in activity unwarranted and unnecessary. As general and president Dwight D Eisenhower said, "beware the military industrial complex". Increased military activities = increased military contracts= a negative draw on society and the economy. | The Navy strives to be a good neighbor and analyzed all training activities at SSTC with respect to applicable air and water regulation. As described in Section 2.1 of the EIS, possible alternate locations for training have been explored through criteria that were established to aid in the determination of the feasibility of a site or range for training. Due to a number of factors (training area availability, environmental constraints, proximity to base, etc.), other sites were determined to not be reasonable locations for training; please see Section 2.1.3. A specific example (for Camp Pendleton) is now provided in the EIS to illustrate why alternate locations are not feasible. Navy and Marine Corps |

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| | | | training ranges are complimentary and used for different functions to complete a full military training curriculum for all commands. |
| 112. | Barbara Lathrop | As an owner and resident of the Coronado Cays I would like to express my very serious concerns regarding the proposed increase of training and helicopter flights along the silver strand. At present helicopters are flying over the Cays although it was my understanding this was not to happen. Wwith the proposed increase of helicopter flights by 185% this is frightening to me.<br>The expanded activities will disrupt the lives, well being and sleep of the residents of the cays considerably unless the paths of travel to and from the training areas are limited to at least 1000 yds off of the ocean and into the bay on the bay side. All residents on the silver strand will be affected as well as beach users at the Silver Strand Beach park, a park used by many all summer. I live halfway between the bay and the ocean and am disturbed by the current helicopters flying now and the proposed night flights and increases will cause great distress and disturbed sleeping that will affect the health and quality of life for us all. The entire Strand is a recreation area used by runners, joggers and bicycle riders and the increased training with the noise and smoke from some of this training will destroy one of the loveliest areas available for these pursuits. I beseech you to give my requests your consideration to preserve the environment of this beautiful area. | The typical flight pattern in support of SSTC-S inland training consists of an approach along the San Diego Bay flight corridor, turning west on the southern side on Emory Cove, and beginning a descent into SSTC-S, targeting the drop zone to the west of Bunker 99 on the northern end of SSTC-S. Once established in this approach, the helicopters remain at 500 feet over residential neighborhoods and do not reduce their elevation to 150 feet until they are over SSTC-S. On departure, the helicopters ascend to the west over the Pacific Ocean.<br><br>As described in Section 3.6.1 of the FEIS (Affected Environment), a substantial amount of daytime and nighttime helicopter activity occurs in the vicinity of SSTC that is not associated with SSTC training activities. Nighttime helicopter transits from NOLF and NASNI, and to and from SSTC-S, occur only over water. The only helicopters overflying residential areas at night are Department of Homeland Security or U.S. Coast Guard. Information on these flight patterns, as well as the percentage of sorties associated with training at SSTC, has been added to Sections 2 and 3.6 (Acoustic Environment) of the SSTC FEIS. |
| 113. | Barbara Lathrop | As an owner and resident of the Coronado Cays I would like to express my very serious concerns regarding the proposed increase of training and helicopter flights along the silver strand. At present helicopters are flying over the Cays although it was my understanding this was not to happen. with the proposed increase of helicopter flights by 185% this is frightening to | The typical flight pattern in support of SSTC-S inland training consists of an approach along the San Diego Bay flight corridor, turning west on the southern side on Emory Cove, |

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| | | me.<br>The expanded activities will disrupt the lives, well being and sleep of the residents of the cays considerably unless the paths of travel to and from the training areas are limited to at least 1000 yards off of the ocean and into the bay on the bay side. All residents on the silver strand will be affected as well as beach users at the Silver Strand Beach park, a park used by many all summer. I live halfway between the bay and the ocean and am disturbed by the current helicopters flying now and the proposed night flights and increases will cause great distress and disturbed sleeping that will affect the health and quality of life for us all. The entire Strand is a recreation area used by runners, joggers and bicycle riders and the increased training with the noise and smoke from some of this training will destroy one of the loveliest areas available for these pursuits.<br>I beseech you to give my requests your consideration to preserve the environment of this beautiful area. | and beginning a descent into SSTC-S, targeting the drop zone to the west of Bunker 99 on the northern end of SSTC-S. Once established in this approach, the helicopters remain at 500 feet over residential neighborhoods and do not reduce their elevation to 150 feet until they are over SSTC-S. On departure, the helicopters ascend to the west over the Pacific Ocean.<br><br>As described in Section 3.6.1 of the FEIS (Affected Environment), a substantial amount of daytime and nighttime helicopter activity occurs in the vicinity of SSTC that is not associated with SSTC training activities. Nighttime helicopter transits from NOLF and NASNI, and to and from SSTC-S, occur only over water. The only helicopters overflying residential areas at night are Department of Homeland Security or U.S. Coast Guard. Information on these flight patterns, as well as the percentage of sorties associated with training at SSTC, has been added to Sections 2 and 3.6 (Acoustic Environment) of the SSTC FEIS. |
| 114. | Becki Lock | While we understand the need to train and perhaps to increase training, many of us do not feel as if the area can sustain the levels of ramped up training you are requesting. This is not a "not in my backyard" issue. This request for increased activity is just plain too much in a relatively small space. There has to be more alternatives and/or a creative way for the Navy to get the training they require (share with Pendleton?) without causing so much potential harm. Quality of life will be severely impacted. Too much noise (often late at night) will cause much disruption to the community which supports you. Beyond that, most are very concerned about the environmental impact. The stretch of beach is very narrow and the many protected species of bird are at risk. Further, the multitude of requested beach landings, more concussion type grenades, more land pollution, and more fuel polluting the water, means there is obvious potential to inflict a lot of damage to the sea life. Please know that we as a community want to continue to support the military. However, the request to increase training to the levels stated is not supported. Many won't state their objection out of fear and feelings of helplessness. So, please consider the community (as we do pay our taxes to support you) when determining what is appropriate. | The Navy recognizes its proximity to surrounding communities and has attempted to structure its training activities to achieve operational readiness while minimizing any potential impact to the surrounding area. As described in Section 2.1 of the EIS, possible alternate locations for training have been explored through criteria that were established to aid in the determination of the feasibility of a site or range for training. Due to a number of factors (training area availability, environmental constraints, proximity to base, etc.), other sites were determined to not be reasonable locations for training; please see Section 2.1.3. A specific example (for Camp Pendleton) is now provided in the EIS to illustrate why alternate locations are not feasible. |

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| 115. | William and Erna Lockhart | We attended the presentation in Imperial Beach, February 23. Unfortunately, we had to leave before all the comments had been heard, but we were encouraged to voice our concerns, and here are ours:<br>Concerns: Traffic on Silver Strand Blvd. Leading into the radio station<br>Noise factor due to increase in the sorties<br>Number of exercises<br>Concern for children's safety at Camp Surf.<br>Height of platforms etc. to be built<br>Effect on Property values<br>We have lived in North IB for 20 years - just a few houses from the gate leading to the radio station. We are enjoying an unobstructed view from our balcony from Point Lorna to Coronado to Silver Strand, unbelievable sunsets, sound of the surf peace and tranquility, and we like it that way. Even Camp Surf took care not to disturb the views when they expanded.<br>We understand the need for training to stay alert. Believe us, we are all for the military (my husband is a WWII D-Day 13 veteran with the RAF.) But having the peace in this, as yet undiscovered, quiet little town suddenly being disturbed by that huge increase in sorties (up to 2200), firearms (from 150 to 1400) and training exercises to 5,343 - and in addition the mine-fields, vernal pools, and disruption of the life of endangered species - is a lot to ask of us.<br>5,343 exercises - There are 365 day a year! So how many a day, month? Time of day? And how many here at beaches white and purple..? Will the helicopters take off from and land close to North end of IB?-<br>Is it not possible to incorporate the training with the all the area you have now and have had for 60 years? Yes, it is nice for our nice young military men to be able to go home to their own beds but what about us, the residents, who will have our nights and sleep disrupted? And the building of "platforms" - will they obstruct the view?<br>Children at Camp Surf - Concern for their safety with possible discharged bullet casings, mine debris? not to mention the air pollution from the helicopters. Effect on property value, with the increased noise and disturbances. Who would want to buy (now) prized beach properties when they will be having the noise of helicopters and machine guns to contend with?<br>Would suggest that in addition to notifying the fire station and police station of upcoming exercises, why not place a notice in our local paper, The Imperial Beach Eagle with a date ( of course, if that is not a secret) so we will not be concerned when we hear the machine gun fires.<br>Last but not least, the speed of cars must be controlled on Silver Strand Blvd. There are children, not only in Camp Surf, animals, bicyclist and elderly slow walking people crossing the street.<br>We would like to see a 25 miles zone and a speed bump on Silver Strand Blvd.<br>You asked for comments, - and we are giving you ours. Not that we expect to get answers to our concerns directly, but perhaps through some of the additional meetings you no doubt will be conducting some of them will be addressed. We hope so. Thank you for your time. | The Navy appreciates your concern and has analyzed traffic (Section 3.14; Transportation and Circulation), noise (Section 3.6; Acoustics), number of exercises (Chapter 2; tempo of training), children's safety (3.15; Protection of Children), platforms (Section 2.3.4; Introductions of platforms and equipment), and property values (Section 3.15; Socioeconomics within the SSTC EIS.<br><br>Navy is responsible for traffic on its controlled land. Once personnel leave the base, they are subject to Department of Transportation regulations. Various speed and traffic control measures would be the responsibility of the City of Imperial Beach. Please note that due to this and other similar yours and others comments, the Navy is considering implementing increased signage or message board requesting Navy personnel to obey all posted speed limits, keep radios turned down, etc., as personnel leave the base (similar to what is done on NASNI, Naval Base Coronado, and Naval Amphibious Base).<br><br>The typical flight pattern in support of SSTC-S inland training consists of an approach along the San Diego Bay flight corridor, turning west on the southern side on Emory Cove, and beginning a descent into SSTC-S, targeting the drop zone to the west of Bunker 99 on the northern end of SSTC-S. Once established in this approach, the helicopters remain at 500 feet over residential neighborhoods and do not reduce their elevation to 150 feet until they are over SSTC-S. On departure, the helicopters ascend to the west over the Pacific Ocean.<br><br>As described in Section 3.6.1 of the FEIS (Affected Environment), a substantial amount of daytime and nighttime helicopter activity occurs in the vicinity of SSTC that is not associated with SSTC training activities. Nighttime helicopter transits from NOLF and NASNI, and to and from SSTC-S, occur only over water. The only helicopters overflying |

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| | | | residential areas at night are Department of Homeland Security or U.S. Coast Guard. Information on these flight patterns, as well as the percentage of sorties associated with training at SSTC, has been added to Sections 2 and 3.6 (Acoustic Environment) of the SSTC FEIS.<br><br>Air pollution and noise at Camp Surf are addressed in the EIS within Section 3.1; Air Quality and Section 3.6; Acoustics.<br><br>The health and safety of the public, in general, relative to the existing and proposed training activities at SSTC, are addressed in Section 3.16, Public Health and Safety. No substantial adverse effects on public health or safety from activities at SSTC-S were identified. The anticipated effects on residents of Camp Surf would be as described for the general public. The potential for mine debris to wash ashore exists, but such an event is very unlikely given the Navy's standard operating procedures. The potential for blank or simunition cartridges expended on land during training to migrate onto Camp Surf from SSTC-S is negligible.<br><br>All increases in operation tempo are discussed in Chapter 2. To address comment regarding "building of platforms”, please refer to Section 2.3.4 of the EIS. Under military terms, a 'platform' refers to new Navy vessels, aircraft, and vehicles and not physical raised areas or stages. The Navy also refers to 'causeway platforms' in the EIS when discussing Elevated Causeway Systems and Roll-on Roll-off Facilities activities in Table 2-1. These platforms will not be obstructing any viewsheds.<br><br>With regard to property values, the Navy has analyzed the effect of Navy training on the area within Section 3.15; Socioeconomics. Based on the analysis within Section 3.15, existing regional population and associated housing impacts, employment rates, and regional economy would remain unchanged. |

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| | | | As listed in NBC INST 3502-1, the Navy does notify local public safety agencies and city governments about specific upcoming hazardous or high-visibility night training events so that the local governments may disseminate the information to their communities. Because of this and similar comments, the Navy is evaluating the possibility of extending advanced notification to the neighborhoods of Imperial Beach and Coronado through contact with City offices or the Naval Base Coronado website. |
| 116. | Donna MacKersie | I have been a homeowner in/resident of Imperial Beach since 1993, and I am very concerned about the Navy developing the Silver Strand further for military training, killing more flora and fauna in that delicate area, and creating additional noise in Imperial Beach, which is already inundated by helicopter noise. I am aware that some people are impervious to noise, but I am not one of them. Since I've lived in I.B., I've been awakened MANY nights by loud helicopters circling my area, typically around 11-12pm, either Border Patrol or Sheriff agents, searching for illegals or whatever they're doing. Additionally, since, after 40 years as a legal secretary, I have been largely unemployed for the past year and a half and have been spending a lot of time at home during the weekdays, there is a CONSTANT roar of airplane engines that we must suffer through during the daytime hours. I understand that there is value in training near the shoreline, but is it not possible to create training locations in areas where we residents and the flora and fauna of the area will not be negatively affected? What about the vast areas in Otay Mesa -- why not train out there? I feel the same about this as I do about the idiocy of building ANOTHER stadium in downtown San Diego, which is already heavily overcrowded, traffic is impossible, etc., etc. -- why don't they build a stadium in Otay Mesa? It's close to San Diego, and there's a huge amount of space out there, and they wouldn't be wasting oceanfront space and creating additional traffic and noise problems for local residents! I cannot even imagine what the traffic would be like if they built a stadium in the National City beach area as was being considered! I-5 is a nightmare as it is during rush hours -- are these developers really that clueless, or are they only looking for increased income? The attorney promoting building the Chargers stadium says that events there won't conflict with the rush hour - - who does he think he's fooling?<br><br>Please -- train elsewhere! The Olympic Training Center built in the east where there was space -- certainly the Navy can do likewise. I do not want to have to sell my home and move elsewhere because the noise has become intolerable. | As described in Section 2.1 of the EIS, possible alternate locations for training have been explored through criteria that were established to aid in the determination of the feasibility of a site or range for training. Due to a number of factors (training area availability, environmental constraints, proximity to base, etc.), other sites were determined to not be reasonable locations for training; please see Section 2.1.3. A specific example (for Camp Pendleton) is now provided in the EIS to illustrate why alternate locations are not feasible.<br><br>Additionally, the Navy recognizes its proximity to surrounding communities and has attempted to structure its training activities to achieve operational readiness while minimizing any potential impact to the surrounding area. The Navy has developed mitigation measures for activities that may cause an impact to the environment or surrounding area and has presented these in the EIS, most notably Sections 3.11 and Section 3.12, which describe various mitigation for flora and fauna. Helicopter overflights of Imperial Beach consist of pilots transiting from NASNI to NOLF, or performing touch-and-go's at NOLF, for training activities unrelated to the SSTC training activities addressed in the FEIS. Helicopter flights in support of SSTC training activities depart from NASNI, transit over water to the north of Imperial Beach, and approach and |

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| | | | depart from the training beaches with as little overflight of land areas as possible |
| 117. | Zeke Mazur | Since the military requires exclusive use of the beach at certain times; I would like the Union Tribune, on its weather page, to list when the beach is closed. | Due to the necessary flexibility inherent in scheduling training activities, it would be extremely difficult to publish notifications in the local newspapers in a timely manner. However, based on your comments and those of others, the Navy is investigating various methods by which to notify the public. |
| 118. | Patricia W. McCoy | First, let me state that I do understand the U.S. Navy's need for combat training readiness to accomplish their mission in various arenas around the globe. However, I do believe there are some items that could be changed enough to make life bearable for people in Imperial Beach, particularly those of us who reside in the northern portions of the city.<br>We have been good neighbors to the Navy in all the years this base has been operational. Now we are asking you for a small quid pro quo. Since some of the noise related exercises are really not mitigable we would request that you consider an earlier cessation of noise causing events, perhaps to 10:00 P.M. This seems eminently reasonable on a work night. The neighborhoods and your soldiers could be home and in bed at a reasonable hour and would conform to demands as outlined in the DEIS that military personnel not be deployed out of country to do this type of training. Many of us have to be up early for work and some of these workers are employed at North Island.<br>We had a dog park opened by the Navy under Captain Gianni (now Admiral) for our use but it was taken away and closed. We would ask that this facility be reopened for use when it is inadvisable to use the beach. This way neighbors can exercise their companion animals and have a pleasant place to go.<br>While you are not expanding the footprint of operations there is concern over the increased intensity of those exercises. The Navy has done a good job with their stewardship of the endangered California Least Tern and the Western Snowy Plover. There is concern for continued viability of these birds due to their habits of beach foraging and nesting, a behavior honed after many thousands of years of developmental evolution. These traits are not changed overnight just because we have a use for their habitat. Protection of vernal pools is essential for the survival of button celery and fairy shrimp. These species may seem unimportant and inconsequential in the scheme of things but I would emphasize that they are indicators of the state of our living environment. The environment is the underpinning of life for all living things including civilian and military alike and the mission of the Navy is to protect not only the | The Navy recognizes its proximity to surrounding communities and has attempted to structure its training activities to achieve operational readiness while minimizing any potential impact to the surrounding area. The Navy has developed mitigation for activities that may cause an impact to the environment or surrounding area and has presented these in the EIS.<br><br>The Navy considered time and location of training so as to minimize disturbances to the local community and does its best to conduct noise-producing activities during the day. However, to train in real-world scenarios that may occur overseas, Navy personnel must train at night. Personnel need to train in these dark, late night conditions to ensure they are prepared for real-world operations.<br><br>The area referred to as a Dog Park has not been formally established through a formal real estate agreement in accordance with Navy policy. The Navy currently has identified this area as needed for training and is not available for public use.<br><br>The Navy will be completing a Vernal Pool Management and |

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| | | civilian population of this country but also the land that sustains us.<br>As you state in the DEIS, this area is unique and as far as I am concerned it is uniquely beautiful and irreplaceable in its current form. I urge you to go the extra mile to protect the nation's endangered species and avoid a “take" of any of them.<br>As a former California Coastal Commissioner I have seen well meaning uses degrade and destroy entire ecosystems on which we all rely.<br>The comment period is all too short for a document ten years in the making. It would be greatly appreciated if the comment period could be extended at least another 45 days to accommodate those who would still like to respond to this eight hundred plus page document.<br>In conclusion I would like to remind you of the inconsistency of water quality due to sewage contamination particularly in the winter months. I do not like the idea of your young service people working in water whose quality leaves, at times, a lot to be desired. I would suggest you implement a water testing component into the document as part of your operations.<br>I noticed a deficiency in the document where there is no mention of climate change and sea level rise. I realize this is a NEPA document and it may not cover this topic. I would like to see realistic measures taken to cope with sea level rise. How do you propose to deal with these climate change issues in order to protect our investments at this site? | Monitoring Plan to help determine whether the impacts identified in the EIS remain at the low levels expected. If impacts are more substantial than the low levels anticipated or impacts could lead to the extirpation of fairy shrimp from any individual pool, then the Navy will reinitiate consultation with the USFWS. The Plan will include focused invasive plant inspection survey in the pools and their watersheds; plant, topographic, hydrological, and water quality surveys (including salinity); and protocol fairy shrimp surveys. In addition, the Navy will be determining the baseline distribution and abundance of San Diego fairy shrimp and condition of the vernal pool habitat prior to initiating training activities in or around the vernal pools at SSTC-S Inland. No button celery has been documented in any of these pools during past surveys, only San Diego fairy shrimp.<br><br>The Navy appreciates the public involvement in the NEPA process. In response to requests by the cities of Imperial Beach and Coronado and citizens, the public and agency comment period for the FEIS was extended to March 30th.<br><br>Ocean and bay water quality, including the effects of discharges of treated sewage and storm water runoff, are addressed in Section 3.5 of the FEIS. Because the purpose of the EIS is to address the effects of the Proposed Action on the public and the environment, rather than on itself, the effects of ocean water quality on military trainees are not addressed in the FEIS. The Navy takes the health and fitness of its personnel seriously, however, and closely monitors the conditions under which training activities are conducted.<br><br>Climate change is addressed in Section 4 of the FEIS as a cumulative impact on the public and the environment to which the Proposed Action would make an insignificant contribution. Because the purpose of the EIS is to address the effects of the Proposed Action on the public and the environment, rather than on itself, the effects of sea level rise on the Proposed |

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| | | | Action are not addressed in the FEIS. While sea level rise was not specifically addressed, the proposed training activities do not require any fixed facilities that would require protection or relocation. The primary effect of sea level rise on Navy training activities on SSTC would be a decrease in the width of the training beaches. Ground access to the beaches and local weather conditions might also be affected. |
| 119. | Deb McKay | I find access to the draft EIS problematic. While the electronic version is available in pdf, it is an extremely large file that takes time to download. Accessibility to the document would be enhanced if it were available in smaller, downloadable files. An excellent example of this is the format used by the Southern California Range Complex EIS website whereby you can search for information by chapter or section. I can dig down to the areas that interest or affect me and not have to wade through the entire, voluminous document. | Your comment has been noted |
| 120. | M. Dan McKirnan | The Recovery Plan for least terns is old and based on outdated information so there is no valid way to conclude that the additional take by alternatives 1 and 2 will not further jeopardize the species. Can the EIS provide a Species Viability Analysis that reflects current knowledge and cumulative impacts? Alternatives 1 and 2 describe the potential taking of the endangered least tern and snowy plover with the expanded military activity. I understand the law that allows incidental taking of birds during military readiness activity. What specific actions will you take in adaptive management if it is determined that excessive taking of least terns and snowy plovers is occuring? Military training in Alternatives 1 and 2 will produce significant noise impacts that could flush significant numbers of migratory birds in the Bay and along the Strand. As you referenced, this impact is more detrimental to birds naive to noise created by military activity. What adaptive management strategies will you use to study noise effects on migratory birds and make appropriate adjustments to protect birds during the migratory season? I applaud the Navy for their past efforts to protect the endangered least tern and snowy plover. However, I am not convinced that the proposed Alternatives 1 and 2 will adequate protect these species. | The USFWS is responsible for such a viability assessment, while the Navy is responsible for management and contributions to least tern recovery, which are listed in detail in Section 3.12 of the FEIS.<br>The take estimates are worst case scenario, and in actuality the birds tend to redistribute to safer areas. The Navy is proposing to develop and implement a long-term site enhancement plan for SSTC-N, including both the oceanside and the bayside beaches. The long-term site enhancement plan is estimated to more realistically mitigate for an estimated 360 nests annually. This site enhancement plan will work to control and where possible remove invasive non-native vegetation on the beaches, and if appropriate, replace it with native vegetation. SSTC-N oceanside training lanes currently contain over 16 acres of overgrown invasive vegetation (Table 3.12-13), mostly towards the back one third of the beach. While this additional depth of beach is needed for several reasons, including providing separation from the highway, most training has a minimal footprint on this area. Training is most heavily concentrated in areas closest to the tide line. Removal or replacement of invasive overgrown vegetation in the back beach area will open these safer areas up to nesting activity. |

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| | | | Additionally, the nature and level of expected take has been addressed in a Biological Assessment and the Navy has completed consultation with the USFWS and a Biological Opinion was signed July 7, 2010, which concluded that with mitigation measures in place, training activities associated with the Proposed Action would not jeopardize the continued existence of Endangered species Act -listed species. |
| 121. | M. Dan McKirnan | I am not convinced that the proposed increased military training activity in SSTC-S in Alternatives 1 and 2 does not raise the question of environmental justice for the City of Imperial Beach. As you indicated, this community has more poverty, 16.8% of persons living below the poverty line compared to 7.6% for the City of Coronado and 11.3% for San Diego County. Imperial Beach also has a higher % of Hispanics (43.9%) compared to Coronado (13.1%) and the County (29.9%). This community will experience more noise related to the military training activity with Alternatives 1 and 2. | The analysis in the FEIS indicated that both communities will be affected by the increase of military training activities. The discussion in Section 3.15 of the EIS states that this is not disproportional towards one community or the other. |
| 122. | M. Dan McKirnan | 4.3.3.1 Global Climate Change Table 4-3: Greenhouse Gas Emissions describes a doubling of emissions in tons/year with either Alternatives 1 and 2. The Secretary of the Navy has established several goals for the Navy's consumptions of fossil fuels with hybrid vehicles by 2015 and alternative energy sources including wind and solar by 2020. Alternative 1 and 2 will increase CO2 emissions by 60,554 tons/year. Why can't this EIS describe specific actions at SSTC, NASNI and NAB to offer at least 50% offsets in alternative and renewable energy for Alternatives 1 and 2? | As stated in Table 4-3, these data show the increase in annual $CO_2$-equivalent ($CO_2e$) emissions estimated for the Preferred Alternative (60,554 metric tons) and the $CO_2e$ emissions generated from all sources in the U.S. in 2006 (7,054 million metric tons) (USEPA 2009). Therefore, $CO_2e$ emissions associated with the preferred alternative would amount to approximately 0.00086 percent of the total $CO_2e$ emissions generated by the U.S. Under any of the alternatives, cumulative impacts to global climate change would be minimal.<br><br>The Navy does not have offsets for the Proposed Action however, the Navy has been at the forefront of nonrenewable fuel reduction. The Navy has decreased energy usage on base through mandatory requirements; activities on the Silver Strand have been scheduled to reduce the numbers of vehicles transporting troops to activity areas to reduce driving time. Navy Secretary Ray Mabus stated that 50 percent of the Navy's energy will come from alternative resources by the year 2020. In the past year, the Navy has invested more than $100 million in renewable energy projects throughout the Southwest. For example, the Navy is developing are |

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| | | | geothermal energy projects. These and other initiatives have lowered the Navy's overall energy use by almost 18 percent over the past six years, and it is on track to achieve a 30 percent reduction by 2015. |
| 123. | M. Dan McKirnan | 6.2 Relationship between short-term and long-term productivity. The EIS describes military activities in Alternatives 1 and 2 as long-term. Does this mean these areas will be needed for decades? What if our need for military readiness declines in 5 or 10 years and peace breaks out? What adaptive management procedures will be undertaken to restore lost habitat and species impacted by this military activity? I endorse the No Action alternative and urge the Navy to reconsider the use of the vast Camp Pendleton site for this surge period of training. | The increase in training activities is not the only driver for the Navy's Proposed Action but also the changes in types of training and platforms, as well as a need for diversity in training. If there is a decrease in training, many of the conditions will tend towards current use because of the natural tendency of training towards training lanes 1-7 and 11-14 (vs. 8-10) as well as a natural tendency towards the northern developed area of SSTC-S (vs. the undeveloped southern areas of SSTC-S). Implementation of the Proposed Action would occur over a five year period. Training activities will be evaluated in five years (2015) for the accuracy of meeting 100 percent of the training requirements as analyzed in the EIS. If new mission requirements are necessary to support training needs, supplemental NEPA documentation may be required.<br><br>Management practices as well as measures to mitigate potential impacts to the SSTC environment have been presented in the individual resource sections of the EIS. Possible alternate locations for training have been explored through criteria that were established to aid in the determination of the feasibility of a site or range for training. Due to a number of factors (training area availability, environmental constraints, proximity to base, etc.), other sites were determined to not be reasonable locations for training. |

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| 124. | Tracy McPherson | I simply want to say that the city Councils of Imperial Beach ( the no growth/no change/no communication council) and Coronado City Council (the now yuppified group that has forgotten that the U.S. Navy has supported them for decades) need to get their collective heads out of the sand or wherever they are and get out of the way. You have a job to do, train these people and help keep America America. Go Navy. I am in the flight path of the helicopters and I do hear the gunfire occasionally. I am right across S75 from the old ComCenter.<br>I am reminded every time I hear this or the jets from North Island, those are our planes and guns, the voices I sometimes hear are American. Thank You God I am safe today and tonight. I am a civilian, my former/late husband flew Willie Victors out of North Island. God Bless all of you, do your job as it needs to be done. | The Navy recognizes its proximity to surrounding communities and has attempted to structure its training activities to achieve operational readiness while minimizing any potential impact to the surrounding area. In light of this proximity, the Navy has developed mitigation for activities that may cause an impact to the environment or surrounding area and has presented these in the EIS. Mitigation measures and management practices are discussed within each resource section and within Chapter 5; Mitigation. |
| 125. | Robert Miller | Growing up in San Diego just before and during the Second World War and living in San Diego, Coronado and Imperial Beach allows for a perspective on this ribbon of sand known as the Silver Strand. I lived in the Coronado Shores for over ten years and looked out on the Strand many times each day. Being in Imperial Beach for the past fifteen years I have been up and down the Strand countless times, mostly driving, but occasionally on foot.<br><br>This site is world class - sun, warmth, light, open space, mild climate, ocean breezes, ocean, beautiful beaches, harbor, blue skies, aquatic activities - you name it. Housing, lodging and recreational facilities and military activities existing alongside habitat preservation and restoration makes for a unique combination that has been developed over the decades and cannot be found anywhere else.<br><br>However, walking from North Island all the way to Camp Surf in Imperial Beach it is obvious that this narrow spit of sand is past the saturation point and cannot tolerate more human activity without there being a wholesale change of character. This area is overwhelmed by traffic, military, civilian and recreational activities and plainly, to me, has passed the tipping point. | The Navy recognizes its proximity to surrounding communities and has attempted to structure its training activities to achieve operational readiness while minimizing any potential impact to the surrounding area. As described in Section 2.1 of the EIS, possible alternate locations for training have been explored through criteria that were established to aid in the determination of the feasibility of a site or range for training. Due to a number of factors (training area availability, environmental constraints, proximity to base, etc.), other sites were determined to not be reasonable locations for training; please see Section 2.1.3. A specific example (for Camp Pendleton) is now provided in the EIS to illustrate why alternate locations are not feasible. |
| 126. | Ronald and Nancy Mires | While everyone should be concerned about all the items on the subject list, we also should be aware that the Navy has always been a good neighbor in Coronado and tries it's best not to disrupt people's lives or the habitat more than is absolutely necessary. Coronado is a Navy town and we should be happy and proud the Navy is so prominent in our community. Some citizens may be inconvenienced by heavy traffic for a few hours each day and there may be some impact on the beaches or the birds, but it's a small price to pay for the freedom we enjoy from having a highly trained military force. We're in two wars at the moment and there is a need to train more troops..so we all need to let the Navy get on with their hard work. I know many of our fine training operation 100%. | Your comment has been noted. |
| 127. | Roland Moritz | As a resident in the Coronado Cays, and a retired USNR officer previously stationed on a DDR in San Diego in 1953. My new bride and I rented in Coronado during that period and decided at that time that Coronado would be our eventual retirement location. Since 1997 we have been fortunate to be living that dream. The news of the Navy's plans to impact our paradise in such a huge way comes as a great shock and disappointment to us. We have always been happy with the thoughtful and considerate presence of the US Navy in our beautiful community of | The Navy recognizes its proximity to surrounding communities and has attempted to structure its training activities to achieve operational readiness while minimizing any potential impact to the surrounding area. Due to a number of factors (training area availability, environmental constraints, |

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| | | Coronado. I must point out, however, that the aircraft passing overhead on their landing approach to North Island Naval Air Station does result in noticeable pollution in the air we breathe as well as the layer of fuel and exhaust deposited on our community as the aircraft pass overhead. This, when multiplied as a result of the proposed large increase in air traffic over our area will certainly result in considerably aggravated detrimental healh impact to our citizens. And, as Coronado and the Coronado Cays populations are made up of many retirees, the health impact would undoubtedly be even greater. And, of course, the added noise pollution must not be overlooked. With regard to the EIR, I would respectfully request that my concerns be received with consideration and the good Navy neighbor policy which has been appreciated over the years. Let me conclude by suggesting that a location for such a large amount of air traffic should take place in largly unpopulated areas such as the Marine Base at Camp Pendleton, and other such underpopulated areas. Sincerely, Roland Moritz | proximity to base, etc.), other sites were determined to not be reasonable locations for training; please see Section 2.1.3. A specific example (for Camp Pendleton) is now provided in the EIS to illustrate why alternate locations are not feasible. |
| 128. | Omar Nicieza | I am 80 years old and my wife is 70. I worked hard for my weekly check until I was 72.My wife did the same, and now our golden years are plagued by the excessive noise of the helicopters that deprive me to sleep, and the intrusive black dust that keeps my wife obsessed with cleanliness Now to crown the situation,comes your 10 years in the making draft: Lets occupy the rest of the open spaces; lets go from 700 flies to over 2,000...<br>I understand the frustrations of the Ministry of Defense with the uncertain results of the regular troops after many years of war in Irak and Afghanistan. I understand that with strategic attacks with drones and tough professional Seals,we could obtain better results...<br>BUT, TO PROTECT ME YOU WANT TO MAKE MY LIFE MORE IMPOSSIBLE TO LIVE ??<br>In my working life,I invented a motto that hanged in my office and showed to any big shot that disagreed with a position I took:<br>“LOGIC SHOULD SUPERSEDE AUTHORITY”<br>I wish you or your superiors could read it today and think about it... | As proposed for Alternatives 1 and 2, up to 1,643 helicopters may be involved with SSTC training events. Approximately 150-200 helicopters per year would fly into SSTC-S inland under Alternatives 1 and 2. The remaining 1,450 to 1,500 helicopter operations would occur offshore in the boat lanes or bay training areas. The most substantial increase in helicopter operations from baseline to Alternatives 1 and 2 would occur with the 386 new MH-60 mine hunting operations, in the western portions of boat lanes.<br><br>As described in Section 3.6.1 of the FEIS (Affected Environment), a substantial amount of daytime and nighttime helicopter activity occurs in the vicinity of SSTC that is not associated with SSTC training activities. Nighttime helicopter transits from NOLF and NASNI, and to and from SSTC-S, occur only over water. The only helicopters overflying residential areas at night are Department of Homeland Security or U.S. Coast Guard. Information on these flight patterns, as well as the percentage of sorties associated with training at SSTC, has been added to Sections 2 and 3.6 (Acoustic Environment) of the SSTC EIS document |

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| 129. | Laura Orozco | I would just like to say that I would not be very happy if the increase in training would mean more "night flying" by planes and helicopters over our houses. The noise at night would not make any of the Cay's Resident's happy. | The Navy recognizes its proximity to adjacent communities, and has attempted to structure its training activities to achieve operational readiness while minimizing potential impacts to the surrounding area. Nighttime helicopter transits from NOLF and NASNI, and to and from SSTC-S, occur only over water. The only helicopters overflying residential areas at night are Department of Homeland Security or U.S. Coast Guard. Information on these flight patterns, as well as the percentage of sorties associated with training at SSTC, has been added to Sections 2 and 3.6 (Acoustic Environment) of the SSTC EIS document. |
| 130. | Cathy Potter | We were very disappointed to read that you are planning to expand the Navy's training program in Coronado.<br><br>The areas we've seen on maps for this increased activity seem way too close the lovely Hotel Del Coronado and the residential towers south of the hotel.<br><br>It seems the increased activity and noise will be detrimental to the enjoyment and safety of the beach by residents and visitors.<br><br>We strongly urge you to reconsider your plan and move the training farther down the beach or use other sights such as North Island or even Camp Pendleton away from residential areas. | As described in Section 2.1 of the EIS, possible alternate locations for training have been explored through criteria that were established to aid in the determination of the feasibility of a site or range for training. Due to a number of factors (training area availability, environmental constraints, proximity to base, etc.), other sites were determined to not be reasonable locations for training; please see Section 2.1.3. A specific example (for Camp Pendleton) is now provided in the EIS to illustrate why alternate locations are not feasible. |
| 131. | Ann Price | Our Military is in need of every training resource it can utilize. While I am all for protecting the environment I feel that the Navy needs to have areas to train in order to protect the American people AND the environment. We need to start thinking about human life first, then nature preserves, etc. | The Navy recognizes its proximity to adjacent communities, and has attempted to structure its training activities to achieve operational readiness while minimizing potential impacts to the surrounding area. The Navy has developed mitigation for activities that may cause an impact to the environment or surrounding area, and has presented these in the EIS. Mitigation measures and management practices are discussed within each resource section and within Chapter 5; Mitigation. |

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| 132. | Dierdra Price, Ph.D. | I am a resident of Coronado and have lived in Coronado Shores for 26 years. I recently learned that the Department of the Navy is planning to increase the levels of training at the Silver Strand Training Center. Our family hears the training that goes on throughout the year. It is already loud and obtrusive. We live under a flight path that has substantially raised its activities in recent years. Planes and now helicopters not only fly more often, they fly closer to our buildings at all hours of day and night. In the past, planes flew out further over the ocean instead of buzzing close to our residences. To discover that you are proposing to increase training from 3926 annual activities to 5543, helicopter sorties from 800 to 2200, and firearm discharges from 150 to 1400, the noise will further disrupt peaceful living. Helicopter noise is grating on the nerves and you are expanding their sorties by nearly two-thirds.<br><br>I understand that we share Coronado island. The Navy has to take into account that you operate around civilians who live in Coronado. So your sensitivity to our home life is of utmost importance. The Navy has many facilities around the country. So if you choose to expand your training in a residential neighborhood, you must look out for the residents. I hope you will come up with a solution that includes flying planes and helicopters further out over the ocean when training and landing as well as designing your training schedule and location to be as least intrusive as possible.<br><br>We hope for some semblance of peace and quiet in our home and neighborhood. You are the one to make sure this happens. | Nighttime helicopter transits from NOLF and NASNI, and to and from SSTC-S, occur only over water. The only helicopters overflying residential areas at night are Department of Homeland Security or U.S. Coast Guard. Information on these flight patterns, as well as the percentage of sorties associated with training at SSTC, has been added to Sections 2 and 3.6 (Acoustic Environment) of the SSTC EIS document.<br><br>As described in Section 2.1 of the EIS, possible alternate locations for training have been explored through criteria that were established to aid in the determination of the feasibility of a site or range for training. Due to a number of factors (training area availability, environmental constraints, proximity to base, etc.), other sites were determined to not be reasonable locations for training; please see Section 2.1.3. A specific example (for Camp Pendleton) is now provided in the EIS to illustrate why alternate locations are not feasible. |
| 133. | Ambassador John Price | I am deeply concerned with the increased levels of training and the impact it would have on the Coronado Shores and surrounding community.<br>I would appreciate the Navy's cooperation and efforts to maintain the quiet atmosphere which currently exists at the Coronado Shores. | The Navy recognizes its proximity to adjacent communities, and has attempted to structure its training activities to achieve operational readiness while minimizing potential impacts to the surrounding area. The Navy has developed mitigation for activities that may cause an impact to the environment or surrounding area, and has presented these in the EIS. Mitigation measures and management practices are discussed within each resource section and within Chapter 5; Mitigation |

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| 134. | The Sack Family | This family fully supports the expansion program which we have seen in the local newspapers and as received in a separate mailing to our home. We have lived at the Coronado Shores with a unit facing the beach/ocean for many years and have nothing but respect and support for the training that goes on for the Navy Seals and associated military activities both in the ocean and on the strand.<br><br>We also would point out that those who bought property or otherwise decided to live in the area were fully cognizant of the presence and importance of the military training and associated activities in this area and do not feel that their complaints are justified.<br><br>Feel free to use/present this letter in any hearings or reviews that may be underway. | Your comment has been noted |
| 135. | Ray and Lorreta Saez | We have major concerns about the proposed expansion of increased training activity along the Silver Strand. Increasing the helicopter sorties from 778 per year to 2,200 is unacceptable. The helicopters make a significant noise when they pass anywhere near our home. We do not want to live under the conditions occurring around Ream Field. We looked at homes by the Tijuana Estuary in Imperial Beach before we purchased our home in March 1991. Homes in that area are significantly cheaper than the one we purchased because the helicopter noise is intolerable for most people. Our quality of life, health & financial situation would be decreased 100% if sorties were increased to the degree stated.<br>The endangered species living on the bay need to be protected in order to continue to exist on this earth. The Navy should respect that. Another consideration is the amount of noise firearm discharges create. We are sometimes awakened at night by that noise. It seems that the Navy wants to take over most of the area not already inhabited by animals and people. We agree that training our military is important but it should not be at the expense of the quality of life of those of us who live near by. Please consider protecting endangered species including humans by scaling back the training sites, helicopter sorties and firearm discharges. Let's create an environment in which we can live together as good neighbors. | Realism in training is an essential element of SSTC training. Nighttime operations are an important part of training at SSTC-S, to ensure that personnel are prepared for real world situations.<br><br>The Navy recognizes its proximity to adjacent communities, and seeks to structure its training activities to achieve operational readiness while minimizing potential impacts on nearby residents. The Navy has developed mitigation plans for activities that may affect the environment or adjacent urban areas, and has presented these in the EIS.<br><br>As described in Section 3.6.1 of the FEIS (Affected Environment), a substantial amount of daytime and nighttime helicopter activity occurs in the vicinity of SSTC that is not associated with SSTC training activities. Helicopter overflights of Imperial Beach and the Tijuana Estuary consist of pilots transiting from NASNI to NOLF, or performing touch-and-go's at NOLF, for training activities unrelated to the SSTC training activities addressed in the FEIS. Nighttime helicopter transits from NOLF and NASNI, and to and from SSTC-S, occur only over water. The only helicopters |

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| | | | overflying residential areas are Department of Homeland Security or U.S. Coast Guard. Information on these flight patterns, as well as the percentage of sorties associated with training at SSTC, has been added to Sections 2 and 3.6 (Acoustic Environment) of the SSTC EIS document.<br><br>As proposed for Alternatives 1 and 2, up to 1,643 helicopters may be involved with SSTC training events. Approximately 150-200 helicopters per year would fly into SSTC-S inland under Alternatives 1 and 2. The remaining 1,450 to 1,500 helicopter operations would occur offshore in the boat lanes or bay training areas. The most substantial increase in helicopter operations from baseline to Alternatives 1 and 2 would occur with the 386 new MH-60 mine hunting operations, in the western portions of boat lanes.<br><br>The typical flight pattern in support of SSTC-S inland training consists of an approach along the San Diego Bay flight corridor, turning west on the southern side on Emory Cove, and beginning a descent into SSTC-S, targeting the drop zone to the west of Bunker 99 on the northern end of SSTC-S. Once established in this approach, the helicopters remain at 500 feet over residential neighborhoods and do not reduce their elevation to 150 feet until they are over SSTC-S. On departure, the helicopters ascend to the west over the Pacific Ocean.<br><br>The commenter's concerns about increased helicopter sorties, effects on wildlife, and late-night impulsive noise events are acknowledged. As described in Sections 3.10, 3.11, and 3.12 of the FEIS, the Navy has analyzed the potential impacts of training activities to ESA-listed species in detail. Additionally, Section 7 consultation has been completed with the USFWS, which concluded that with the mitigation measures described in the FEIS, the training activities would not jeopardize the continued existence of ESA-listed species. |

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| 136. | Elizabeth Schulman | The EIS is long and detailed. Therefore, I stopped incorporating salient passages. The report itself states that the impact of alternative two is not substantially different than the impact of the first alternative.<br>While the law requires a lengthy and detailed EIS, common sense does not. The report's brief description of the adjoining areas says it all. The populated coastal area simply cannot support more than fifteen hundred additional sorties and deafening helicopter flights. The children (mostly military family kids) at the Strand Elementary School will be unable to concentrate on their studies and may likely suffer hearing impairment. The families in military housing will equally suffer from increased noise levels. Motorists will be increasingly distracted by the sorties on the beach leading to a possible increase in vehicle accidents.<br>An increase in the demise of wildlife seems to have been written off as "friendly fire." Exactly how many birds and sea life are expendable? Do we have a ratio demonstrating how many human lives will be spared as a result of increasing the intensity of training at the expense of wildlife?<br>Is the USN expecting to increase the number of recruits to be trained at the location? It appears the number of recruits is limited by demographics and the lack of a draft. The peninsula-type geography of the area limits the number of recruits who can be run through any program. The Navy Seal Program is reported to have a 2/3 "dropout rate." It appears the Navy Seal training program is sufficiently difficult. Common sense dictates this expansion should not be approved. | As described in Section 3.6.1 of the FEIS (Affected Environment), a substantial amount of daytime and nighttime helicopter activity occurs in the vicinity of SSTC that is not associated with SSTC training activities. Helicopter overflights of Imperial Beach and the Tijuana Estuary consist of pilots transiting from NASNI to NOLF, or performing touch-and-go's at NOLF, for training activities unrelated to the SSTC training activities addressed in the FEIS. Nighttime helicopter transits from NOLF and NASNI, and to and from SSTC-S, occur only over water. The only helicopters overflying residential areas at night are Department of Homeland Security or U.S. Coast Guard. Information on these flight patterns, as well as the percentage of sorties associated with training at SSTC, has been added to Sections 2 and 3.6 (Acoustic Environment) of the SSTC EIS document.<br><br>As proposed for Alternatives 1 and 2, up to 1,643 helicopters may be involved with SSTC training events. Approximately 150-200 helicopters per year would fly into SSTC-S inland under Alternatives 1 and 2. The remaining 1,450 to 1,500 helicopter operations would occur offshore in the boat lanes or bay training areas. The most substantial increase in helicopter operations from baseline to Alternatives 1 and 2 would occur with the 386 new MH-60 mine hunting operations, in the western portions of boat lanes.<br><br>The commenter's concerns about demise of wildlife have been addressed in Sections 3.10, 3.11, and 3.12 of the FEIS, where the Navy has analyzed potential impacts of training activities to ESA-listed species in detail. Additionally, Section 7 consultation has been completed with the USFWS with the signing of a Biological Opinion, which concluded that with the mitigation measures described in the FEIS, the training activities would not jeopardize the continued existence of ESA-listed species.<br><br>No increase in personnel stationed at SSTC is included in the |

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| | | | Proposed Action. There is an increase in activities performed by existing personnel under the Proposed Action. This clarification has been added to Section 2 of the FEIS |
| 137. | Teresa Scott | We live in the Coronado Cays and I and my family strongly support the Navy's training requirements. You folks please do what is needed to train our fine military and we the local community will do our patriotic duty to support you. Thank you for serving our country. | Your comment has been noted. |
| 138. | Timothy Searfus | The requirements of properly training sailors for future missions in support of our country's strategic goals cannot be subjugated to the voices of a relatively small group of people who complain about potential negative effects on marine life, noise pollution and other potential effects of increased training but in fact this group only looks out for it's own selfish interests, i.e., their over-valued coastal properties. I lived in Coronado from 1969 until 2003. "New Money" moved into Coronado in the early 80s and since then various actors have incessantly complained about the Navy and how the Navy is inconveniently disturbing their tranquility; after all, these folks paid dearly for their homes on Ocean Blvd and Coronado Avenue and they conveniently forgot about the monument at Sunset Part at Gate 5 of North Island that says the Navy's first Navy Flying School was established around 1915 at North Island. Huh, so the Navy was there first eh? The Navy bends over backwards to maintain harmony with nature and the Snowy Plover and California Least Tern are direct benefactors of Navy determination to conserve nature. Hell, if it weren't for Camp Pendleton, the Greater Southern California Megalopolis would extend from Ventura County to Tijuana. The increased training activities and concomitant construction in support of this are critical to national security and we as a people owe a debt of gratitude to the U.S. Navy. | The Navy recognizes its proximity to adjacent communities, and has attempted to structure its training activities to achieve operational readiness while minimizing potential impacts to the surrounding area. The Navy has developed mitigation measures for activities that may impact the environment or surrounding area, and has presented these in the EIS. Mitigation measures and management practices are discussed within each resource section and within Chapter 5; Mitigation. |
| 139. | Louis Semon | My wife and I welcome all activities of the military. We have been living on Coronado both in the Cays and now downtown and found no changes in our quality of life. Continue with the great mission at hand. | Your comment has been noted. |

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| 140. | Robert Shugert | I live in the Coronado Cays. I served 5 years in the US. Air Force and 5 years in the National Guard and I strongly support our Military including the U.S. Navy, U.S. Army and Marines that will be involved in increased military training in the adjacent area to my home. I am concerned about the increased helicopter noise that will result from the substantial increase in "sorties" down the south bay and over my home. I have "learned to live with the present noise" , but to increase it by ten times would certainly impact my life style as well as potentially lowering the value of not only my home but the 1200 homes that exists in the Coronado Cays. I hope that when training that involves helicopters will be limited to day time hours and that the flyway be either out over the ocean or down the middle of south bay. | The current scope of helicopter noise analysis in the EIS is summarized in Section 3.6. Helicopter overflights, including night flights, consist mostly of pilots transiting between NASNI and NOLF for training activities unrelated to the SSTC training activities in addressed in the FEIS. The typical flight pattern in support of SSTC-S inland training consists of an approach along the San Diego Bay flight corridor, turning west on the southern side on Emory Cove, and beginning a descent into SSTC-S, targeting the drop zone to the west of Bunker 99 on the northern end of SSTC-S. Once established in this approach, the helicopters remain at 500 feet over residential neighborhoods and do not reduce their elevation to 150 feet until they are over SSTC-S. On departure, the helicopters ascend to the west over the Pacific Ocean. |

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| 141. | Marie Simovich | My comments focus on vernal pools and particularly Branchinecta sandiegonensis.<br><br>3.11.1.4.2 Please use current references from the primary literature. This section is poorly referenced and does not reflect a current and solid understanding of the subject. Give details of the vernal pool surveys that were done in reference to B. sandiegonensis including number of pools surveyed, whether surveys were both wet and dry as required by the US Fish and Wildlife Service, the density of cysts in pools, the number of seasons surveyed, the number of fillings surveyed etc.<br><br>5.10 The mitigation section lacks sufficient details to evaluate.<br><br>5.10.5 Foot traffic should be severely restricted. Any path can result in altered hydrology and potential pool drainage. Population surveys should be done more frequently than every five years. Plans should include modifications for dry years. Populations should be evaluated for viability and increasing or decreasing population reproduction via both live animals and the cyst bank. Other floral and faunal elements should be monitored. The full crustacean community should be evaluated for richness and composition and this should be included in restoration, mitigation, monitoring and criteria for success plans. Efforts should focus on maintaining not only viable populating of fairy shrimp, but a vernal pool community with species diversity appropriate for the area. | USFWS Protocol surveys were conducted involving two wet samplings. Dry season samplings are unnecessary under this protocol. The Navy will use scheduling and other planning tools to minimize avoid impacts to vernal pools.<br><br>The Navy will avoid the occupied vernal pools and their watersheds adjacent to the road at SSTC-S Inland (i.e., pools 1 through 7 marked with flexi-stakes) year-round, to the maximum extent consistent with training needs. Foot traffic when the pools are dry consists primarily of small groups. As presented in Section 3.11 of the FEIS, trail forming and soil compaction are unlikely, resulting in no impact to population viability. Additionally, the Navy has completed consultation with the USFWS, and has received a signed Biological Opinion which concludes that proposed training activities will not jeopardize the continued existence of San Diego fairy shrimp.<br><br>As part of the conditions of the Biological Opinion, the Navy will be completing a Vernal Pool Management and Monitoring Plan to help determine whether the impacts identified in the EIS remain at the low levels expected. The Plan will include focused invasive plant inspection survey in the pools and their watersheds; plant, topographic, hydrological, and water quality surveys (including salinity); and protocol fairy shrimp surveys. In addition, the Navy will be determining the baseline distribution and abundance of San Diego fairy shrimp and condition of the vernal pool habitat prior to initiating training activities in or around the vernal pools at SSTC-S Inland. If impacts are more substantial than the low levels anticipated or impacts could lead to the extirpation of fairy shrimp from any individual pool, then the Navy will reinitiate consultation with the USFWS. |
| 142. | Kent Smith | I have reviewed many of the outlines for and against the increased use of the Silver Strand beach for training. My opinion is undecided because there are many positives and negatives to both sides of this important and relatively permanent decision. I am concerned that no mention has been made of the fact that there are underground tunnels or observation pits that were put in | Excavations are discussed in Section 3.2 of the EIS, and the analysis presented there indicate that there would be negligible impacts from the minimal number of excavations associated with military training activities presented in the EIS. |

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| | | place 30 years ago that may still exist between the shoreline and the roadway. These should be included in any analysis of the environmental impact. As a frequent user of that beach when it more available to the public there were two occasions when I noticed military personnel observing the ocean and beach from ground locations that had to enjoy at least six feet of excavation for it to occur. It is unlikely that these structures (if they still exist) would pose a challenge to the type of wildlife in question but a total lack of mention in an environmental impact statement is not appropriate. | |
| 143. | Yvonne Stowe | The noise from the training that is currently going on is bad enough without more! Sometimes they come so close to the top of our three story condo building it is down right scary. Please reconsider for those of us who live near by. We can't even talk on a cell phone outdoors facing the ecstasy when the copters are going up and down! | Helicopter overflights of Imperial Beach consist of pilots transiting from NASNI to NOLF for training activities unrelated to the SSTC training activities addressed in the EIS. The typical flight pattern in support of SSTC-S inland training consists of an approach along the San Diego Bay flight corridor, turning west on the southern side on Emory Cove, and beginning a descent into SSTC-S, targeting the drop zone to the west of Bunker 99 on the northern end of SSTC-S. Once established in this approach, the helicopters remain at 500 feet over residential neighborhoods and do not reduce their elevation to 150 feet until they are over SSTC-S. On departure, the helicopters ascend to the west over the Pacific Ocean.<br><br>The NBC Commanding Officer has established air operations course rules for Naval Air Station North Island and the Naval Outlying Landing Field (NOLF, note formally known as Ream Field) to conduct safe required training and operational flights while minimizing impacts on the surrounding community. These course rules are designed to promote safe air operations, meet Navy aviation training requirements, and protect communities beneath established flight paths. Pilots are given annual course rule briefs to ensure their familiarity with course rules, procedures, and noise abatement measures. Current air operation instructions (course rules) advise pilots when departing NOLF westward to either fly 1/4 mile south of beach houses or cross over beach houses at or above 800 feet above mean sea level (300 feet above the Federal Aviation Administration's minimums set in Federal Aviation Regulation 14 CFR Part 91, see reference below) until they are |

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| | | | near the communication station (old Navy Radio Receiver Facility). Weather conditions, other aircraft in the flight patterns, etc. can and do affect the aircraft's flight route and altitude. Federal Aviation Regulation 14 CFR, Part 91 Section 119, titled Minimum Safe Altitudes, paragraph d states, helicopters may be operated at less than the following minimums prescribed for other aircraft, e.g. over congested areas, 1,000 feet above the highest obstacle within a horizontal radius of 2,000 feet of the aircraft, and over other than congested areas 500 feet above the surface. |
| 144. | Anna Stump | I was driving home down the Strand late the other night when out of nowhere I heard machine gun fire, pretty close. I had my car windows closed. I was very startled. If I was not a resident of the area, I would have freaked out, maybe swerved off the road in fear. I feel there should be signs warning drivers, bikers and joggers that military exercises are happening, especially at night. I've also experienced driving through heavy smoke from military beach activities that is distracting and even cuts visibility. | The Navy recognizes its proximity to adjacent communities, and has attempted to structure its training activities to achieve operational readiness while minimizing potential impacts to the surrounding area. As listed in NBCINST 3502-1, the Navy does notify local public safety agencies and city governments about specific upcoming hazardous or high-visibility night training events so that the local governments may disseminate the information to their communities. Because of this and similar comments, the Navy is evaluating the possibility of extending advanced notification to the neighborhoods of Imperial Beach and Coronado through contact with City offices or the Naval Base Coronado website. Mitigation measures and management practices are discussed within each resource section and within Chapter 5; Mitigation. |
| 145. | Rick Taylor | I previously lived in a beach community when the Navy upped fighter jet training flights during the war in Vietnam at a nearby Naval air station. Complaints were many and frequent, but were silenced when the CO hung a wall banner facing the residential area which was most vocal. It read, PARDON OUR NOISE; IT IS THE SOUND OF FREEDOM.<br>That is applicable here and now, as well as a like comment re beaches and bird sanctuaries - the Navy was here first and used these beaches unfettered long ago. | Your comment has been noted. |

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| 146. | Kimberly Tolles | As a 20-year resident of Coronado and homeowner in the Coronado Cays (and currently homeowners association board member), I am extremely concerned about the Navy's training complex proposal from the point of view of increased noise, increased numbers of aircraft, more air fuel pollution than we already get, live fire next to homes and public beaches and nighttime activities. I felt the Navy's presentation before the Coronado Cays Homeowners Association Board understated the potential changes represented by this plan to the point of possibly being untruthful. I agree completely with the concerns expressed in the City of Coronado's letter and with the letter from the City of Imperial Beach. Training activities are necessary, of course, and have always been conducted in our extremely small community but to increase them to the extent proposed by the Navy amounts to reckless public endangerment. | The letter from the City of Coronado has been reviewed and the concerns highlighted therein have been responded to and, where applicable, changes have been made to the EIS. The Navy recognizes its proximity to adjacent communities, and has attempted to structure its training activities to achieve operational readiness while minimizing potential impacts to the surrounding area. The Navy has developed mitigation measures for activities that may impact the environment or surrounding area, and has presented these in the EIS. Mitigation measures and management practices are discussed within each resource section and within Chapter 5; Mitigation. |
| 147. | Gary Trieschman | Create public viewing area of exercises (of course w/security clearance) and involve public in reason for training | Adding a public viewing area would encumber training activities (loss of training space) and would be a security issue. In addition, Department of Defense security clearance regulations are only given for a specified need and would not be extended to civilians for observation of training. |
| 148. | Normandie Trovato-Wilson | There are a lot of complex factors in play when it comes to evaluating the impact this will have on endangered and threatened species. Of my particular concern is the training in the vernal pools. 90% of California's vernal pools have been destroyed due to development. I believe the Navy is committed to maintaining environmental integrity at the Silver Strand complex-however, protecting a vernal pool is not as simple as erecting a barrier around a WSP nest. There are hundreds, if not thousands, of species that coexist within vernal pools and it seems impossible to predict the effects that training in the vernal pools would have upon these species, including the endangered San Diego Fairy Shrimp. Extinction, and the loss of these sensitive habitats, is forever.<br><br>Also of special concern is the fact that the California least tern is still in decline and there seems to be little explanation as to why, and there is no species recovery plan for the terns. More information needs to be gathered about the Least Terns and the Western Snowy Plovers-especially information on how the species are doing from Oceanside all the way to the border-before making a choice about the use of the 3 shipping lanes during the breeding season.<br><br>There seems to be little to no mention of mitigation within the current EIS, which is also concerning.<br><br>In addition, there is no mention of returning to the current state of use should Navy training levels decrease in the future. I realize the Navy is not predicting such a reduction, but there should be a stipulation that should Navy training levels decrease in the future, that the use of the | The Navy is proposing to introduce limited foot traffic in some of the vernal pools at SSTC-S when they are dry. This activity is not the same as a development project that eliminates the pools completely. The 12 to 207 people entering the vernal pools each year would generally be individuals transiting through a pool on foot (e.g. on a reconnaissance mission), not large troop movements through every pool.<br><br>The Navy will establish the baseline distribution and abundance of San Diego fairy shrimp and condition of their vernal pool habitat at SSTC-S Inland and monitor training activities to ascertain the impact of training activities on San Diego fairy shrimp distribution and abundance within the action area. The Navy will report the monitoring results and any observed incidental take to the USFWS annually, and will manage the vernal pools occupied by San Diego fairy shrimp to minimize any training impacts detected by monitoring. The DEIS has been revised to indicate these terms and conditions. |

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| | | land would revert to the way it is now, should the Navy end up going with Alternative #1.<br><br>I compliment the Navy on their commitment to environmental stewardship. It is refreshing to see the military take such a stand for environmental integrity. It gives me hope. Ultimately, there is very little way to predict the effects that these changes would have on the WSP and the California Least Tern and until more answers are provided as to these species' progress, it seems hasty to change while these species are still making efforts to recover. A solution could be to gradually phase in these changes over the next 1-5 years and chart the progress of the endangered species. An alternative for the vernal pool training would be to conduct some training around/in a vernal pool which is in poor condition, and chart the effects (weeds, etc) of foot traffic around the vernal pools. This would also provide the Navy with time to figure out mitigation measures for the use of the vernal pools and test solutions for the inevitable problems and imbalances in the ecosystem which will result once foot traffic is allowed in the vernal pools. Thank you for reading my statement. | The Navy will work to avoid the pools where possible when developing training plans. The Navy will avoid the occupied vernal pools and their watersheds adjacent to the road at SSTC-S Inland (i.e., pools 1 through 7 marked with flexi-stakes) year-round to the maximum extent consistent with training need.<br><br>As part of the conditions of the Biological Opinion, the Navy will be completing a Vernal Pool Management and Monitoring Plan to help determine whether the impacts identified in the EIS remain at the low levels expected. The Plan will include focused invasive plant inspection surveys in the pools and their watersheds; plant, topographic, hydrological, and water quality surveys (including salinity); and protocol fairy shrimp surveys. In addition, the Navy will be determining the baseline distribution and abundance of San Diego fairy shrimp and condition of the vernal pool habitat prior to initiating training activities in or around the vernal pools at SSTC-S Inland. If impacts are more substantial than the low levels anticipated or if impacts could lead to the extirpation of fairy shrimp from any individual pool, then the Navy will reinitiate consultation with the USFWS.<br><br>The effects analyses for the Western snowy plover and California least tern have been updated in the FEIS to add an explanation of how each mitigation measure helps to conserve the species (see Section 3.12.4).<br><br>The increase in training activities is not the only driver for the Navy's Proposed Action but also the changes in types of training and platforms, as well as a need for diversity in training. If there is a decrease in training, many of the conditions will tend towards current use because of the natural tendency of training towards training lanes 1-7 and 11-14 (vs. 8-10) as well as a natural tendency towards the developed northern area of SSTC-S (vs. the undeveloped southern areas of SSTC-S). |

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| | | | The changes that the Navy proposes are not expected to occur immediately, but are expected to be phased in gradually at SSTC as the Navy implements its force structure changes nationwide. The gradual implementation of the Navy's Proposed Action, combined with its intense monitoring program, will allow the Navy and the USFWS to quickly identify changes in the population as the changes are training is implemented. |
| 149. | Joan Van Der Hoeven | I would like to support proposed naval training enhancements along the Silver Strand coastline of San Diego. Far too many of our nations training resources are compromised because of pubic stupidity in purchasing residential properties in areas designated for military use. When our country is at war it is necessary for our troops to train as much as possible for safety's sake. War does not run 8-5, and there are obvious reasons why training at night or on weekends is required. The Navy has observed high standards of hazardous materials management. Beach access is available to the public in numerous alternative areas - our coastal commission assures this. The additional traffic and noise associated with Navy training for a nation at war should be regarded as an acceptable consequence for providing training that could save lives. | Your comment has been noted. |
| 150. | Susan and Monte Weddle | We are responding to the article in the Union Tribune concerning the possible increase in the number of sorties being proposed by the navy. We sincerely hope that you will listen to our concerns.<br>We live in Point Loma and have been greatly concerned over the increase in helicopter and fighter jet noise. The possibility of vastly increasing the number of sorties is unacceptable to us. We recognize the necessity for properly trained troops and we certainly appreciate what our troops do for us. But before you increase the level of noise and vibration in our neighborhood we would like some facts. You stated in the article that the recent number of sorties has been at 700+ in the past year. How many sorties were practiced in 2008 and 200n Our guess and fear is that the number of sorties has been increasing continually over recent years.<br>We certainly agree that naval troops must be properly trained, but we also want the navy to continue to be good neighbors with our community. To that end, we oppose any increase in the number of sorties in Imperial Beach, Coronado, and Point Lorna. | As proposed under Alternatives 1 and 2, up to 1,643 helicopters may be involved with SSTC training events. Approximately 150-200 helicopters per year would fly into SSTC-S inland under Alternatives 1 and 2. The remaining 1,450 to 1,500 helicopter operations would occur offshore in the boat lanes or bay training areas. The most substantial increase in helicopter operations from baseline to Alternatives 1 and 2 would occur with the 386 new MH-60 mine hunting operations, in the western portions of boat lanes.<br><br>The typical flight pattern in support of SSTC-S inland training consists of an approach along the San Diego Bay flight corridor, turning west on the southern side on Emory Cove, and beginning a descent into SSTC-S, targeting the drop zone to the west of Bunker 99 on the northern end of SSTC-S. Once established in this approach, the helicopters remain at 500 feet over residential neighborhoods and do not reduce their elevation to 150 feet until they are over SSTC-S. On departure, the helicopters ascend to the west over the Pacific |

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| | | | Ocean.<br><br>Helicopter noise is addressed in Sections 3.6.2.2.1 and 3.6.2.3.2 of the FEIS. The analysis of helicopter sound indicates that, while the number of helicopter sorties would increase substantially under Alternatives 1 and 2, the increased frequency of short-term sound exposures from increased helicopter pass-bys would not be sufficient to noticeably change the hourly average sound level at any one off-installation location. Because of the logarithmic nature of sound; a doubling of sound energy results is only a three-decibel increase, which under typical conditions is barely discernable. The analysis of helicopter sound is based upon broadly defined flight paths, consistent with a normal degree of variability introduced by pilot discretion, weather, time of day, and safety concerns such as other aircraft. |
| 151. | Dewey Wells | My wife and I have visited your area and think the strand is very nice. However, we really think military needs (as in SEAL training) must come first. We would love for our SEALS to use the strand as much as they need to for training. Keep in mind that the military is the only reason we enjoy the freedoms we do. | Your comment has been noted. |
| 152. | Richard Wilson | I support the Navy's expanded use of their Coronado training facilities. We must all make contributions to protect our country. Accepting some inconvenience is a reasonable contribution for the civilians of Coronado to make in support of the Navy's role in defending our county and its interests. | Your comment has been noted. |
| 153. | Karen S. Wright | I have invested a lot to improve my home. My bedroom windows overtook the Silver Strand Training center. In all those years I have enjoyed the view and the quiet occasionally the navy would use the beach for landing boats and men or for running on the beach. But until the last year or so, I haven't heard gunfire, explosions, or frequent helicopters.<br>Now I understand the navy intends to increase the intrusive noise events. Intrusive noise events will destroy the peace of our neighborhood. Please reconsider and move the noisy training to camp Pendleton where there is no peaceful neighborhood to destroy. | As described in Section 2.1 of the EIS, possible alternate locations for training have been explored through criteria that were established to aid in the determination of the feasibility of a site or range for training. Due to a number of factors (training area availability, environmental constraints, proximity to base, etc.), other sites were determined to not be reasonable locations for training; please see Section 2.1.3. A specific example (for Camp Pendleton) is now provided in the EIS to illustrate why alternate locations are not feasible. |

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| 154. | Susan Yamagata | I live right next to the entrance of the Training Complex. One problem that only happens when it rains is the storm drain (It makes a 90 degree turn just to the east of the guard bldg.) and it gets plugged up and is insufficient to handle the water flow. It backs up, floods and makes a small pond then runs over your entrance road.<br>But, the main problem these past number of years is the speed / traffic when vehicles enter or depart the base gates. I have spoken with many of my neighbors and we have contacted the city of Imperial Beach. They have used a mobile speed detector machine on occasion. But, we would like you to consider more permanent and enforceable options. A few suggestions are:<br>1) There is a Stop sign when exiting the base, but no one uses it. There is a speed bump when exiting the base, but anyone driving fast out of there just bottoms out a bit and continues on at a fast speed. If you would require all exiting traffic to stop at the stop sign, then cars would not be at such a high speed as they leave the base.<br>2) Neighbors have suggested installing a Stop sign at Silver Strand Blvd. and Carnation Ave.<br>3) Neighbors have suggested installing at least two speed bumps, maybe three along Silver Strand Blvd.<br>4) Install 25 mph speed signs.<br>5) Install a Pedestrian crossing that requires drivers to stop.<br>Drivers race down the street, because they like to drive fast, they are late, or they are trying to beat the automatic gate when they see someone ahead of them already has the gate open. And this is specifically for my situation. I drive a small car and when I back out of my driveway, I cannot see down the street when there are cars parked in front of my neighbors. (There are usually vans, suvs, or large trucks.) If I am lucky I can see a little 2 foot opening between the vehicles and I sit and watch that opening to see if anything passes in front of it. But, lately there haven't even been any of those openings. In addition, I have to look towards the inside of the base to see if any vehicles are driving down the road to exit, because I know they will not stop at the stop sign. Then there is the driveway for Camp Surf right across the street, (they should put up stop sign also), because during their busy season their guests just pull out without looking to see if anyone is exiting the navy base. So, I am trying to monitor three different directions without having a clear view. Sometimes, the only thing I can do is look at the guard to see if he is looking down the street or getting up, because, then I know a vehicle is coming from at least one direction.<br>6) I was wondering if you could install a convex mirror outside of the base that shows oncoming traffic on Silver Strand Blvd. that I would be able to use.<br>I know this is not really your concern, but I am afraid with increased traffic due to your plans, the odds of me making it out of my driveway without getting hit are getting worse for me. Thank you for considering my comments on your future plans. | The Navy is responsible for traffic on its controlled land. Once personnel leave SSTC-S, they are subject to local jurisdiction traffic regulations. Various speed and traffic control measures are the responsibility of the City of Imperial Beach. The Navy is considering adding signage or providing a message board requesting that Navy personnel obey all posted speed limits, keep radios turned down, etc., as personnel leave the base, as the Navy does at Naval Base Coronado, Naval Amphibious Base – Coronado, and Naval Base San Diego. Signage is enforced on Navy property. |

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| 155. | Susan Yamagata | I attended the Public Hearings Open House in Imperial Beach. Thank you for providing this opportunity for one-on-one discussions with representatives who could offer clarification on various topics. I spent most of my time at the Community Interests desk talking about traffic safety on Silver Strand Blvd. leading up to the entrance of the complex. They suggested that I write additional comments or suggestions. First off one of the representatives mentioned that they were uninformed about the complaints that many neighborhood residents have voiced about the speeding drag racing and problems pulling out of driveways or side streets when on-street parking blocks a clear view of oncoming traffic. Some of these problems were brought to the attention of Imperial Beach traffic control. In the past (though not for a number of years) an electronic traffic monitoring machine was placed on our street to remind drivers to slow down. I know of one time when a traffic ticket was issued but heard that it was thrown out of court as "entrapment". As part of your review, I'm guessing that you've asked the city of Imperial Beach to share any information gathered over the past seven years. I was also told that there are "warrants" that a situation must meet in order to be able to install anything from a speed limit sign to a stop sign to any other traffic control measure. Examples given were things like numbers of tickets issued, numbers of accidents, numbers of complaints, numbers of deaths. But the problem with those limitations is that after a flurry of complaints by neighbors especially about the speeding problem, nothing lasting was done to address this ongoing situation and it seemed pointless to email or call or leave another message with the City and no messages were ever responded to after calling and leaving a message at the phone number listed on the sign at the Training Complex entrance. Another problem that comes up is who has jurisdiction over street safety issues. I believe the west side of the street at Camp Surf might belong to Coronado and the rest of the street is the responsibility of Imperial Beach. It would benefit the neighborhood if all three parties including the Navy would join together to try and address residents' concerns. I have a feeling that many people who have complained about the traffic in the past have<br>not taken part in this "Comment" opportunity. It would serve community relations if additional outreach was attempted. I suggest that you ask the city of Imperial Beach to set up the electronic message board on Silver Strand Blvd. closer to Palm Avenue so that the people coming out of the other side streets will see it. If you flashed a message: "Traffic safety issues? Please comment here or visit www.silverstrandtrainingcompleseis.com." And then provide a drop box and blank comment forms right next to the sign. I have seen parents with young children crossing Silver Strand Blvd. on there way to the school just around the corner. They do not always go down to the corner crosswalk, because there is a little parkway next to the El Tapatio Restaurant that is a shortcut. In my previous comments I submitted I listed "pedestrian crosswalks" (maybe like the kind with signs that are on Seacoast Drive?) | The Navy is responsible for traffic on its controlled land. Once personnel leave SSTC-S, they are subject to local jurisdiction traffic regulations. Various speed and traffic control measures are the responsibility of the City of Imperial Beach. Due to this and similar comments, the Navy is considering increasing signage or providing a message board requesting that Navy personnel obey all posted speed limits, keep radios turned down, etc., as personnel leave the base, as the Navy does at Naval Base Coronado, Naval Amphibious Base – Coronado, and Naval Base San Diego. |

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| 156. | Susan Yamagata | Another traffic issue is pulling out onto Palm Ave. from Silver Strand Blvd. It seems that there were more street parking spots added on Palm which can cut down on visibility to see oncoming traffic. There are stop signs at 3rd and to the west on Palm Ave. at the corner of the 2nd. With planned increase in traffic for the Complex it would help if you would consider a traffic light or a three-way stop at the corner of Palm and Silver Strand Blvd. If all else fails and Silver Strand Blvd. does not meet the "warrants" to take any traffic control actions, I suggest that the Navy consider using temporary signs. In the past I have spoken to some of the trainers who work at the complex. They told me that every time a new group comes in to start training, they give a speech about speeding and other traffic do's and don'ts when traveling through this neighborhood, but that the majority of participants are young and full of fire and will on occasion disregard these warnings. Maybe at the beginning of each training period a set of temporary signs could be used on the exiting side of the street. Example: First and foremost an enforced "STOP" sign before exiting the base. Then a "25 mph" speed limit sign. Then a friendly reminder that you are driving through a "Neighborhood".<br>But, the problem with this is it doesn't address cars coming into the base or problems with visibility for residents to pull out of side streets or their driveways when you're not sure how fast a car might be coming down the road. Also, if the warrants are not met for street signs etc. then maybe the Navy could install signs like those listed above on their property before the exit gate, then you wouldn't have to meet the warrants? My last suggestion is that you check the schedule for planned complex activities, then come down and sit in your car on our street and see for yourself. The street is not always busy, but traffic is heaviest in the a.m. as trainers and participants are arriving or later when leaving after a training exercise. This visit would not take into consideration the after hours traffic throughout the night or over the weekends. Thank you in advance for at least considering these issues and concerns. I'm hoping that this time some discernible action will be taken to alleviate some of the unsafe traffic situations. | The Navy is responsible for traffic on its controlled land. Once personnel leave SSTC-S, they are subject to local jurisdiction traffic regulations. Various speed and traffic control measures are the responsibility of the City of Imperial Beach. Due to this and similar comments, the Navy is considering increasing signage or providing a message board requesting that Navy personnel obey all posted speed limits, keep radios turned down, etc., as personnel leave the base, as the Navy does at Naval Base Coronado, Naval Amphibious Base – Coronado, and Naval Base San Diego. |
| **F.2 COMMENTS FROM ORGANIZATIONS** | | | |
| 157. | Airport Trust | I represent Donald W. Rogers, Trustee of the Airport Trust, a private trust which has the proprietary interest in an exclusive license under Patent No. US 7,469,859 B1. The patent was issued on December 30, 2008 and describes an airport design having three 12,000 foot runways, a 2,000 acre footprint, two levels surrounded by water, access to the shore by underwater tubes and located in South San Diego Bay.<br>Enclosed are (1) Aerial photograph of the bay with the airport superimposed; (2) Description of Proposed Airport dated February, 2010; and (3) Copy of patent.<br>The site of the airport has been carefully selected to avoid interference with marine traffic, habitats, and other air traffic and is outside the amphibious base security lone.<br>The trustee welcomes the expanded use of the Silver Strand provided it does not conflict with the proposed airport. At this time no conflict is apparent except amphibious operations within the bay which would involve water area within the boundaries of the airport. | The Navy acknowledges your concern over the area that you are suggesting for an airport. The Navy has analyzed current and proposed training activities and analyzed the cumulative impacts of these activities, which include reasonable present and future proposed activities. The Navy has not included the airport in the cumulative analysis because the timeframe and design of the proposed project is not within the reasonably foreseeable future. |

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| | | The proposed airport includes a second entrance to the bay, as shown in the photograph. The advantages are discussed in the description. Such advantages include its use for military vessels. The second entrance is not essential for the proposed airport, but would have beneficial effect to the area, including environmental benefits.<br>Over 50 years have been spent and recently over $17 million in a futile effort to find an alternate airport site to Lindbergh Field which will reach its capacity circa 2020 with no room to expand with any additional runways. The proposed airport is the only feasible solution. It is requested that any expanded use be consistent with the proposed airport. | |
| 158. | California American Water | I recently read in the San Diego Union-Tribune, the Monday, February 22nd edition, that the Navy is utilizing a larger amount of the property on the Silver Strand Training Complex and will be having a larger footprint of operations at that site. I would like to remind those of you responsible for this property that California American Water Company has a 16" cast iron water main that traverses the base from the south end to the north end of it. This main provides a connection between Imperial Beach and Coronado, feeding the Coronado Cays along with the Navy Base. This main was installed in 1912 and has been in continuous service since then. I would make you aware of this critical main so that you always take into consideration the location of the main when you make plans to install new infrastructure on the base. Last year at the very north end of the base there was some sort of large poly-ethylene pipeline bored from the road to the Pacific o Ocean. It was bored in very near proximity to our 16" main and I believe we all dodged a bullet when that main was not damaged. Also, there are a number of vehicles parked in the same area near the fence along Hwy 75 on a day to day basis that are adjacent to two air/vacuum valves we have on the 16" main. I would hope that the vehicles never hit one of those valves and knock them off as it would create a bit of damage and cause us to shut down the 16" main which would put the base out of water and create a low pressure issue in the Coronado Cays. | In this EIS, the Proposed Action does not include new infrastructure. Potential for water main damage from training (a remote possibility) is a utilities / domestic water supply issue rather than a Public Health and Safety issue, and your information has been passed on to NBC Public Works Department. The NBC Public Works Department has access to and processes in place to identify and locate utilities and other important site conditions, i.e. such as but not limited to installed infrastructure, natural resources, cultural resources and more prior to any construction or site disturbance. |
| 159. | California Coastal Commission | Our most significant concerns are: (1) overall increases in noise levels from the large increase in levels of training activities, and in particular, the effects of such noise on habitat and public recreation; (2) expansion of training into currently protected sensitive habitat areas, in particular: (a) least tern and snowy plover nesting areas in Boat Lanes 8-10 in STCC-North (which are currently off limits to training during the nesting season); and (b) vernal pools in STCC-South; and (3) the proposal to limit the number of plover nests to be protected to no more than 22 nests. Despite the length of the document, it remains unclear as to why these decisions have been made and how decision criteria will be analyzed to determine whether such training is needed in these areas. | The potential effects of the Proposed Action on the sound environment are described in Section 3.6 of the FEIS, including effects on adjacent land uses. The analysis indicates that the effects of occasional impulsive noise events from military training activities would have no effect on public use of Silver Strand State Beach or other local recreation areas.<br><br>Given the need to train, the Navy has a robust plan for conserving vernal pool habitat and species. The Navy will use scheduling and other planning tools to avoid minimize impacts to vernal pools.<br><br>The Navy will avoid the occupied vernal pools and their watersheds adjacent to the road at SSTC-S Inland (i.e., pools 1 |

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| | | | through 7 marked with flexi-stakes) year-round to the maximum extent consistent with training needs. Foot traffic when the pools are dry consists primarily of small groups. As presented in Section 3.11 of the FEIS, trail forming and soil compaction are unlikely, resulting in no impact to population viability. Additionally, the Navy has completed consultation with the USFWS, and has received a signed Biological Opinion which concludes that proposed training activities will not jeopardize the continued existence of San Diego fairy shrimp.<br><br>As part of the conditions of the Biological Opinion, the Navy will be completing a Vernal Pool Management and Monitoring Plan to help determine whether the impacts identified in the EIS remain at the low levels expected. The Plan will include focused invasive plant inspection survey in the pools and their watersheds; plant, topographic, hydrological, and water quality surveys (including salinity); and protocol fairy shrimp surveys. In addition, the Navy will be determining the baseline distribution and abundance of San Diego fairy shrimp and condition of the vernal pool habitat prior to initiating training activities in or around the vernal pools at SSTC-S Inland. If impacts are more substantial than the low levels anticipated or impacts could lead to the extirpation of fairy shrimp from any individual pool, then the Navy will reinitiate consultation with the USFWS.<br><br>The degradation of habitat by noise sufficient to alter animal behavior is addressed in both 3.11 and 3.12. Helicopter noise and air turbulence is likely to result in temporary displacement of foraging least terns. Clapper rails may have disrupted communication signals and their predator detection may be disrupted as well. The effects of military noise on wildlife were reviewed by Larkin (1996). Noise affects wildlife differently from humans and the effects of noise on wildlife vary from serious to nonexistent in different species and situations. Pyrotechnics are known to result in bird dispersal |

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| | | | because they are used as a tool in managing airport runways for bird-aircraft strike hazard (Blokpoel 1976). In many cases, such acoustic stimuli lose their effect as birds habituate to them (Larkin 1976). Flares and smoke are expected to have sound exposure levels of 60 to 65 decibels at 50 feet (U.S. Army 2003). A greater effect is observed in species from populations that are unstable and low in number compared to those that are relatively abundant. Long-lasting and repeated exposure could cause a bird to retreat from otherwise suitable habitat. |
| 160. | California Coastal Commission | The Navy has narrowly construed the available alternatives being considered, in terms of those brought forth in the final analysis. The extensive increases in loud activities warrants serious consideration of conducting at least some of them, including the more intrusive ones, in less heavily populated areas, for both social and resource protection reasons. If the Navy does proceed as proposed, it will need to provide a more detailed and compelling explanation to establish that there are no available less damaging alternatives. We understand the concept of keeping training near the home base, but given that Camp Pendleton is within the same county, a clearer explanation is needed for dismissal of use of this site for the activities proposed in sensitive areas. Stating it is rejected based on the need to "achieve training tempo requirements" does not provide the reviewer with any information with which to assess this assertion. | As described in Section 2.1 of the EIS, possible alternate locations for training have been explored through criteria that were established to aid in the determination of the feasibility of a site or range for training. Due to a number of factors (training area availability, environmental constraints, proximity to base, etc.), other sites were determined to not be reasonable locations for training; please see Section 2.1.3. A specific example (for Camp Pendleton) is now provided in the EIS to illustrate why alternate locations are not feasible. |
| 161. | California Coastal Commission | We understand that decision-criteria were used and are listed in the DEIS (on page 2-1). However the analysis explaining why the criteria are applied in certain situations (e.g., a statement on page 2-2 is that relocating some activities to STCC-S would conflict with criteria 2 and 6) is not provided. Also, we note that page ES-5 states the Navy bases its need projections on models of future exercises. While we inherently support and understand the Navy's need to train, without the modeling assumptions and additional information, it is difficult to weigh future training needs against environmental and social impacts. | A new explanation of criteria has been added to Section 2.1.2 in the EIS and an explanation of the logistics and transportation hurdles present in moving training activities has been added to Section 2.1.3.2. |

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| 162. | California Coastal Commission | Given that the Navy is proposing a significant expansion of training, which will increase conflicts with habitat protection, it would appear that listed species such as snowy plovers and least terns warrant increased protection, whereas the DEIS appears to be proposing simply to maintain the status quo (at least with respect to the number of snowy plover nests). We would argue that the increase in activities in Boat Lanes 1-7 would seem to make it all the more imperative that these species have an area set aside (during the nesting season) and left undisturbed. | The Navy has proactively prepared for the expected take through actions taken prior to this request for take. Preparation includes site enhancement, management of lane usage, nest protection, and monitoring, and decades of adaptive management. Snowy plover nests are not necessarily going to be taken, but no more than 22 proposed nests would be protected. In response to this and other comments received, the Navy has revised the EIS analysis on the California least tern (Section 3.12.3.1) and the western snowy plover (Section 3.12.3.2) to provide a more in-depth analysis of impacts that training is expected to have on the species. Additional mitigation measures have been added to the Proposed Action. The benefits of current and proposed mitigation measures are also described and quantified as far as practicable. As discussed in the analysis, the benefits of mitigation are expected to outweigh potential adverse impacts of training. The Navy works each year on site-maintenance and monitoring, plus periodic site enhancement or management approaches to manage terns, and to increase the attractiveness of Delta beaches. The FEIS has been updated (Section 3.12.3.1) to explain the level of loss anticipated under the No Action Alternative compared to Alternative 1, estimated to be an increase of seven nests, on average, in a typical year. The Navy will ensure that biological monitors look for and document the locations of least tern or snowy plover nests, eggs and chicks prior to and after all military training exercises, to allow assessment of take associated with training activities. |

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| 163. | California Coastal Commission | Alternatives eliminated from further consideration include training at locations other than the STCC. It is not clear why proposed training in Boat Lanes 8-10 during the nesting season, which the Navy estimates (based on its models) to occur approximately 24 times/year, could not be relocated to Camp Pendleton, or why Camp Pendleton beaches could not "provide a realistic training environment that simulates real world littoral combat conditions."<br><br>The criteria provided by the Navy (DEIS, page 2-34) indicate these Boat Lanes would be used either: (a) when other suitable lanes are occupied, or (b) "if [lane] attributes make them more suitable for meeting training needs than other available training lanes." Examples of such attributes include beach topographic conditions, distance from other training locations, and a need for diversity in training locations. These criteria appear overly broad, and we believe there should be a much greater burden needing to be satisfied before the Navy would use these lanes. We question why, for example, if the Navy is able to modify beach topography for the purpose of attempting to discourage nesting in heavily trained areas, the Navy is not also able to modify beach topography to provide desired training condition topography in other areas (and thereby avoid Lanes 8-10 during the nesting season). If feasible, such an alternative should be explored for both Camp Pendleton beaches, as well as the remaining Boat Lanes at the STCC. If infeasible, the Navy should explain why. | Under current training conditions, Navy training officers are notified of the locations of the nests and buffers, and plan their training activities to avoid entering the buffer areas. A few training activities, such as individual basic physical fitness activities, may be able to work around the training buffers. These activities incorporate identifying and avoiding plover nest buffer areas into the activity. Other training does not require use of beach areas, and thus would not be affected by the presence of plovers. Most other activities however, are unable to operate around the buffers. The buffers are artifacts on the beach that do not occur in real world wartime situations, and thus adversely affect the value of training (e.g., presence of the plover nests restrict flexibility for maneuvering across the beach and inhibit real-time, tactical decision-making. Personnel may habituate to worrying about avoiding stakes, even while they are fighting at war. Restrictions imposed by stakes during training may lead to habitual avoidance measures and self-imposed concentrations of personnel, even in a combat environment, due to repetitious training with staked boundaries. Personnel may also focus on the stakes and no-go areas rather than learning their training mission). Activities involving heavy equipment and vessels require large unconstrained maneuvering space without encumbrances, precluding areas with buffered plover nests. To accommodate training requirements for these activities, the activities are often shifted in their entirety to the north or south, away from the buffers, so that personnel/equipment will not encounter the buffers/stakes. Under current conditions, this approach is feasible. Where needed, training activities can and are moved to other available training lanes that are free of plover nests or contain a maximum of two plover nests at one time. Historically, SSTC has typically had less than 22 maximum active nests at one time.<br><br>As described in Section 2.1 of the EIS, possible alternate locations for training have been explored through criteria that were established to aid in the determination of the feasibility |

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| | | | of a site or range for training. Due to a number of factors (training area availability, environmental constraints, proximity to base, etc.), other sites were determined to not be reasonable locations for training; please see Section 2.1.3. A specific example (for Camp Pendleton) is now provided in the EIS to illustrate why alternate locations are not feasible. The Navy considered creating an avoidance cap of more than 22 concurrent western snowy plover nests, but found that approach could render lane(s) unusable. Twenty-two concurrent nests would translate into approximately two concurrent nests in each viable lane on SSTC (i.e., 14 training lanes excluding Lanes 1, 5, and 6, which have not historically had nests due to the shallow beach and hummocks). If plover nests increase, buffering each nest will constrain the available beach area such that the beach will not adequately support military readiness training activities. Two nests per training lane at the same time by themselves could encumber 60 meters of the 500 meter beach lane width (12 percent). If the nests happen to be spaced closely together and/or close to the edge of the lane, the area in between the nests or between the nests and the edge of the lane may also become unusable for training (e.g., if there are 100 m between the nests and 50 m between the nests and the edge of the lane, then approximately 40 percent of the lane could be rendered unusable). Snowy plovers are not colony breeders, and prefer to distance their nesting activities as far as they can from other nesting plovers. As such, plover nests are more likely to be evenly spaced and encumber larger, rather than smaller sections of the training beach. Also, as discussed above, many training activities require that an additional buffer be provided away from the staked buffers to ensure that the stakes are not visible or an encumbrance to personnel being trained. Adding a third nest could render the entire lane unusable. With the anticipated increase in training tempo of the SSTC training beaches (see Sections 1.5.1.1 and 3.12.3.1), training activities may not be able be moved to other less encumbered beach lanes like they can be and are under current conditions. |

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| | | | There will not necessarily be more nests in Lanes 8-10. If the plovers increased their nesting activities in Lanes 8, 9, and 10, activities that were scheduled for these lances would need to be shifted to another lane. If all the lanes were occupied, then the activity would need to be shifted to a lane with another activity, and that lane would need to be free of buffered nests or have a maximum of one buffered nest. |
| 164. | California Coastal Commision | The Navy's stated argument for eliminating the alternative of protecting all the snowy plover nests, rather than limiting protection to only 22 nests, is not well explained. Stating a third nest in a given training lane "could render the entire lane unusable" appears speculative, depending on the location of the nests. We would like historic information about conflicts the Navy has experienced in training in these lanes over, say, the past decade. For example, how often have there been more than two active plover nests within a given lane, and what has this meant for Navy training? Has the Navy had to cancel, modify, or relocate training? Is it a given that more than two active nests in a lane at one time makes the lane unusable? If so, please explain. Wouldn't the location of the nests (including proximity to each other, as well as to nests in other lanes) have an important bearing on this question? Has the Navy been able to successfully train in a lane when nests have exceeded two in that lane?<br><br>In addition, if there were greater numbers of nests, but most of those were in Lanes 8-10, which the Navy indicates would be used sparingly, then would it not be easier to protect more than 22 nests? Also, it is not clear how the number 22 was derived, when there are 14 Boat Lanes. If the number was derived from the number of lanes times two nests/lane, shouldn't that total be 28 nests? | Under current training conditions, Navy training officers are notified of the location of the nests/buffers, and plan their training activities to avoid entering the buffer areas. A few training activities, such as individual basic physical fitness activities, may be able to work around the training buffers. These activities incorporate identifying and avoiding plover nest buffer areas into the activity. Other training does not require use of beach areas, and thus would not be affected by the presence of plovers. Most other activities however, are unable to operate around the buffers. The buffers are artifacts on the beach that do not occur in real world wartime situations, and thus adversely affect the value of training (e.g., presence of the plover nests restrict flexibility for maneuvering across the beach and inhibit real-time, tactical decision-making. Restrictions imposed by stakes during training may lead to habitual avoidance measures and self-imposed concentrations of personnel, even in a combat environment, due to repetitious training with staked boundaries. Personnel may also focus on the stakes and no-go areas rather than learning their training |

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| | | | mission). Activities involving heavy equipment and vessels require large unconstrained maneuvering space without encumbrances, precluding areas with buffered plover nests. To accommodate training requirements for these activities, the activities are often shifted in their entirety to the north or south, away from the buffers, so that personnel/equipment will not encounter the buffers/stakes. Under current conditions, this approach is feasible. Where needed, training activities can and are moved to other available training lanes that are free of plover nests or contain a maximum of two plover nests at one time. SSTC has historically typically had less than 22 active nests, at most, at one time.<br><br>The Navy considered creating an avoidance cap of more than 22 concurrent western snowy plover nests, but found that approach could render lane(s) unusable. Twenty-two concurrent nests would translate into approximately two concurrent nests in each viable lane on SSTC (i.e., 14 training lanes excluding Lanes 1, 5, and 6, which have not historically had nests due to the shallow beach and hummocks). If plover nests increase, buffering each nest will constrain the available beach area such that the beach will not adequately support military readiness training activities. Two nests per training lane at the same time by themselves could encumber 60 meters of the 500 meter beach lane width (12 percent). If the nests happen to be spaced closely together and/or close to the edge of the lane, the area in between the nests or between the nests and the edge of the lane may also become unusable for training (e.g., if there are 100 meters between the nests and 50 meters between the nests and the edge of the lane, then approximately 40 percent of the lane could be rendered unusable). Snowy plovers are not colony breeders, and prefer to distance their nesting activities as far as they can from other nesting plovers. As such, plover nests are more likely to be evenly spaced and encumber larger, rather than smaller sections of the training beach. Also, as discussed above, many training activities require that an additional buffer be provided |

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| | | | away from the staked buffers to ensure that the stakes are not visible or an encumbrance to personnel being trained. Adding a third nest could render the entire lane unusable. With the anticipated increase in training tempo of the SSTC training beaches (see Sections 1.5.1.1 and 3.12.3.1), training activities may not be able be moved to other less encumbered beach lanes like they can be and are under current conditions.<br>There will not necessarily be more nests in Lanes 8-10. If the plovers increased their nesting activities in Lanes 8, 9, and 10, activities that were scheduled for these lanes would need to be shifted to another lane. If all the lanes were occupied, then the activity would need to be shifted to a lane with another activity, and that lane would need to be free of buffered nests or have a maximum of one buffered nest. |
| 165. | California Coastal Commission | It is also not clear from the document how the Navy intends to phase in the increased numbers of activities. If the timing of the increases allows sensitive areas proposed for training to be off limits for several years (or some other period) until they are needed, that should be considered as an alternative as well, or at least explained. We recognize that the Navy states these areas will not be used unless needed, but it would be helpful to understand the pace of the proposed increases.<br><br>We have similar concerns over the proposal to expand training to allow foot traffic in vernal pools. The DEIS does not make a compelling case that these pools could not be avoided. At a minimum, it is not clear why fencing (and thereby avoidance) of at least the smaller vernal pools could not be conducted consistent with training needs. | Information has been added to the FEIS indicating the "natural" phase in of activities. By their nature, all activities will not begin at the same time, rather they are spread temporally. Therefore, the phase in period of all these activities will therefore occur over a longer period of time.<br><br>The Navy will avoid the occupied vernal pools and their watersheds adjacent to the road at SSTC-S Inland (i.e., pools 1 through 7 marked with flexi-stakes) year-round, to the maximum extent consistent with training needs. Foot traffic when the pools are dry consists primarily of small groups. As presented in Section 3.11 of the FEIS, trail forming and soil compaction are unlikely, resulting in no impact to population viability. Additionally, the Navy has completed consultation with the USFWS, and has received a signed Biological Opinion which concludes that proposed training activities will not jeopardize the continued existence of San Diego fairy shrimp.<br><br>As part of the conditions of the Biological Opinion, the Navy will be completing a Vernal Pool Management and Monitoring Plan to help determine whether the impacts identified in the |

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| | | | EIS remain at the low levels expected. The Plan will include focused invasive plant inspection survey in the pools and their watersheds; plant, topographic, hydrological, and water quality surveys (including salinity); and protocol fairy shrimp surveys. In addition, the Navy will be determining the baseline distribution and abundance of San Diego fairy shrimp and condition of the vernal pool habitat prior to initiating training activities in or around the vernal pools at SSTC-S Inland. If impacts are more substantial than the low levels anticipated or impacts could lead to the extirpation of fairy shrimp from any individual pool, then the Navy will reinitiate consultation with the USFWS.<br><br>Finally, the vernal pools are not considered part of the Coastal Zone. |
| 166. | California Coastal Commission | It appears from the discussion in several sections of the DEIS that the primary reason for dogs on the beach is for their exercise, and the primary training activities necessitating dog use occur at or near buildings (i.e., away from beaches and sensitive areas). We understand that the dogs are trained not to disturb wildlife, but wildlife may still be intimidated by dogs to the extent they could abandon nesting areas, especially in the cumulative context of overall increases in training levels. Is there a reason, for example, why dog runs could not be excluded from Boat Lanes 8-10 during the nesting season, with their exercise limited to other areas? | Military working dogs are highly trained and under constant voice or leash control of the handler. While effects of recreational dogs in nesting areas are documented in scientific literature, the effects of leashed dogs that are highly trained in obedience and avoidance of wildlife in an area that is heavily used for military training is not yet known. Dogs need to be able to run on the beach rather than on harder paved surfaces to protect their sensitive pads. Repeated long distances on hard surfaces will wear down their pads. The dogs need to be able to train on a full 10-kilometer loop on an infrequent basis to ensure that they have long distance training as well as speed training. As part of the consultation with USFWS, the Navy is proposing a study to assess impacts of military working dogs on California least terns and western snowy plover nesting, such that potential effects can be better understood. |

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| 167. | California Coastal Commission | Page 3.6-24 states that loud activities would occur infrequently at night or on weekends. Can the Navy provide an estimate of the amount of proposed increases in loud noise-producing activities on weekends, holidays, and at night?<br><br>The reference on page 3.6-25 to noise mitigation (referring to Section 3.6.2) is presumably meant to be a reference to Section 3.6.1.6. Also, that section is rather vague. We would appreciate it if the Navy would spell out in greater detail how noise effects on sensitive species and on recreation will be factored into decisions on locating and timing training. | Given the variability of training schedules, it is difficult to reliably predict the extent to which various types of training activities could be conducted at night, on weekends, or on holidays. Most training activities occur during the day on weekdays, as noted in the FEIS. The reference on page 3.6-25 correctly refers to Current Mitigation Measures in Section 3.6.2. Airborne noise effects on sensitive species are addressed in Section 3.11 (Terrestrial Biology), and Section 3.12 (Birds) of the FEIS. Noise effects on recreation are addressed in FEIS Section 3.6; Silver Strand State Beach is specifically addressed as a nearby sensitive receptor. |
| 168. | California Coastal Commission | Page 3.9-12 discusses marine mammal monitoring during underwater detonations and pile driving. The discussion should describe how much training the marine mammal observers will receive. Also, we will want to be added to the list of entities contacted in the event of an observed marine mammal injury. We will also want to receive any monitoring reports on snowy plover, least tern, and/or vernal pool habitat impacts that the Navy may be providing to the U.S. Fish and Wildlife Service. | The Navy provides biological monitoring reports and marine mammal strike reports to the appropriate federal agencies.<br><br>Observers are trained to determine the presence or absence of marine mammals. Due to the low density of marine mammals in the area and shallow waters of SSTC, the expected animals in the area are dolphins and pinnipeds. |
| 169. | California Coastal Commission | Page 3.1-15 references a new activity affecting public access, referenced as N14. New activities are only numbered N1-N11, so this may be a typo. Please identify this activity. | The Activities in question are now listed as N9 and N11 in Section 3.1.2.3.2 of the FEIS. |
| 170. | California Coastal Commission | Page 3.12-26, Fig. 3.12-11, contains a graph showing plover nesting through 2008. Does the Navy have 2009 data for snowy plover nest numbers? If so, please provide, for all the sites shown in Fig. 3.12-11. Also, are there any plover nests yet this year? Please keep us apprised of current nest numbers and locations as the season progresses. | The 2009 data have been added to the figure for snowy plover and the figure for least terns. |

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| 171. | California Coastal Commission | The City of Coronado's comments on the DEIS (Item No. 27) state that the ferry service to NASNI has been discontinued. As this service was, in part, mitigation for traffic impacts from the homeporting of nuclear aircraft carriers, please update us on the status of the ferry service. | Your comment addresses an issue that is outside the scope of this EIS. The SSTC EIS only looks at cumulative impacts from the increase of personnel and traffic from the homeporting of nuclear carriers within San Diego Bay. Specific mitigation within the CVN homeporting EIS was not discussed within the SSTC EIS. However, Naval Base Coronado has established a commuter working group comprised of the selected base personnel, city of Coronado, CALTRANS, Metropolitan Transit System, and others to explore both short and long term actions to enhance, restore, or add to the suite of on-going and past transportation incentive programs, e.g. van pools, car pools, bus ridership, and or bay ferry service pick up points. |
| 172. | California Coastal Commission | Page 3.7-44 contains an error message. | This error message has been corrected in the FEIS |
| 173. | California Department of Fish and Game | The Navy addresses potential short term and cumulative impacts and impact minimization measures, to some extent, from the proposed increases in Navy training activities. However, the Navy does not sufficiently address monitoring, avoidance and habitat compensation for sensitive, rare and unique biological areas. Additionally, potential increases in recreational human and dog disturbances within the ocean side training ranges, expected increased impacts to listed birds by predation, increases in future projects and expected sea level rise due to global climate change have not been fully analyzed for cumulative impacts. | Monitoring, avoidance, and habitat compensation for sensitive, rare, and unique biological areas are described in Sections 3.11 and 3.12. Additional mitigation measures for potential impacts of proposed activities are listed at the end of these respective sections, as well as in Section 5.<br>As indicated in the USFWS Biological Opinion and described in the FEIS, the Navy will improve the delineation of base boundaries to facilitate improved enforcement in these areas to reduce potential impacts of human and dog disturbances. This will include the installation of improved signage, k-rails, and a guard shack. At SSTC-N, temporary barriers and improved signage will be used to more clearly notify the public of the Navy's exclusive use of SSTC-N beach and existing restrictions on public usage of those beaches.<br><br>Climate change is addressed in Section 4 of the FEIS as a cumulative impact on the public and the environment to which the Proposed Action would make an insignificant contribution. Because the purpose of the EIS is to address the effects of the Proposed Action on the public and the environment, rather than on itself, the effects of sea level rise on the Proposed Action are not addressed in the FEIS. While sea level rise was |

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| | | | not specifically addressed, the proposed training activities do not require any fixed facilities that would require protection or relocation. The primary effect of sea level rise on Navy training activities on SSTC would be a decrease in the width of the training beaches. Ground access to the beaches and local weather conditions might also be affected.<br><br>To address recreation user concerns, the Navy is considering increased signage as a result of this and other public comments received. The Navy will delineate the boundary of SSTC-S that parallels the mean high tide line in a manner that does not encumber training exercises. |
| 174. | California Department of Fish and Game | Biological Impacts and Mitigation Strategies<br>Increasing repetitive Navy training activities along with decreasing existing conservation measures may cause long term impacts and significantly add to cumulative impacts to terrestrial and marine species and their habitats. The Department has the following comments, concerns, and recommendations: 1) the FEIS should more fully analyze and address the potential cumulative or long term coastal ecosystem impacts associated with each phase and type of the proposed increased training/construction; 2) the FEIS should include additional studies and/or increased biological monitoring, additional conservation measures, and mitigation plans for the potential long term impacts to listed and sensitive terrestrial and marine species, rare and unique coastal strand habitat, and State- and federally-listed marine birds and their nesting habitat. 3) the Department views the Navy's proposed mitigation and decreases in avoidance and minimization measures for sensitive or listed species and the sensitive coastal strand, dune and eelgrass habitats, as insufficient protection and compensation from cumulative impacts. | The individual effects analyses of military activities (short-term and long-term) are presented in their respective sections, where the potential impacts are discussed in more detail. The determinations of the impacts of military activities are also presented there. The cumulative impacts section discusses the impact on the environment which results from the incremental impact of the military training activities when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions. The discussion of applicable impacts from the respective sections have been carried forward into the cumulative impacts discussion. |
| 175. | California Department of Fish and Game | 1) Cumulative or Long Term Impacts not fully Addressed in the DEIS:<br><br>The FEIS should address the potential for the following types of impacts and show how they will be avoided, minimized, mitigated and monitored for SSTC North and South and Bayside Training Ranges as applicable:<br><br>During bird nesting and California grunion (*Leuresthes tenuis*) spawning season the fully protected and state and federally endangered California least tern (*Sternula antillarum brownii*) and the California species of special concern and federally threatened Western snowy plover (*Charadrius alexandrinus nivosus*) as well as other sensitive bird species and their habitats may potentially be impacted due to the proposed significant increases in vehicle, air and foot/dog traffic in the intertidal and upland areas of SSTC-North and South and bayside. A proposed buffer zone limiting bird nesting distribution and a proposal to eliminate sensitive habitat markers is described in the DEIS and indicates that the Integrated Natural Resources Management Plan (INRMP) for this area has been revised recently to support such a proposal. | The 2002 INRMP for Naval Base Coronado is being revised, and will be consistent with the analysis and conclusions of this FEIS.<br><br>The individual effects analyses of military activities (short-term and long-term) are presented in their individual sections, where the potential impacts are discussed in more detail. The determinations of the impacts of military activities are also presented there. The cumulative impacts section discusses the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such |

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| | | The Department was not aware that the Coronado INRMP (2002) was revised recently to support and accommodate a reduction in bird conservation. Additionally, the biological resource discussion does not clearly identify an analysis on how these sensitive species could potentially be affected due to cumulative impacts. | other actions. The applicable impact analyses from the Environmental Consequence sections have been carried forward into the cumulative impacts discussion. |
| 176. | California Department of Fish and Game | After near shore disturbances, (training activities and construction), an increase in opportunistic, non-native, terrestrial and marine species may be seen within the project vicinity. An increase in non-native species would cause increased disturbance of ecosystem processes and decreased native biodiversity. This may be due to spreading/dispersal of non-native species during construction or from non-native species aggressively taking advantage of a newly disturbed area. | The Navy conducts annual surveys and treatments for invasive plants, and will be expanding treatment of iceplant in the near future. A vegetation management plan under development to support terns and plovers also benefits sensitive plant species. Focused rare plant management includes *Phacelia stellaris, Dudleya variegata*, among other rare plants that are less locally abundant on Silver Strand. Additionally, the Navy conducts surveys for *Caulerpa taxifolia*, and invasive non-native marine algae for all construction projects, and introductions of non-native marine fish and invertebrates are highly unlikely because neither ballast water nor equipment is transported to SSTC without cleaning and inspection. |
| 177. | California Department of Fish and Game | Significant and repetitive vehicle, helicopter, and detonation impacts to terrestrial and marine biological resources, including sensitive and listed birds, may occur at the site causing cumulative impacts. Some of these effects may include the destruction of marine plants and algal species and their substrate such as surf grass, eelgrass and kelp species. Vehicle impacts from driving in the intertidal and on the beach may cause impacts to the kelp wrack on the beach used for forage and shelter by various terrestrial and marine species, including western snowy plovers that feed primarily on terrestrial and aquatic invertebrates (brine flies, brine fly larvae and brine shrimp). Significant burial or destruction of fish and their habitat from detonations may also occur at scattered rock bottom habitats that are found immediately offshore of the project site, thus reducing the prey base for California least terns that feed primarily on small fish. Vehicles may also impact active California least tern, western snowy plover and other listed and sensitive bird eggs, chicks and nests. Helicopters flying over actively-nesting California least terns and western snowy plovers may flush adults off the nest and leave the eggs and chicks vulnerable to predation. | The individual effects analyses of military activities (short-term and long-term) are presented in their individual sections, where the potential impacts are discussed in detail. The determinations of the impacts of military activities are also presented there. The cumulative impacts section discusses the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions, regardless of what agency (federal or non-federal) or person undertakes such other actions. The applicable impact analyses from the Environmental Consequence sections have been carried forward into the cumulative impacts discussion. |
| 178. | California Department of Fish and Game | Coastal strand habitat is an important and diminishing California natural resource and supports a unique ecological community (Dugan and Hubbard 2009). The DEIS does not discuss the impacts to biodiversity and the uniqueness, importance and sensitivity of strand habitat nor how it should be conserved due to proposed increase in impacts. | Terrestrial habitats are discussed and analyzed in Section 3.11 of the FEIS. Mitigation and monitoring plans discussed in representative resource sections discuss conservation methods under the Action Alternatives. |

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| 179. | California Department of Fish and Game | Significant fragmentation of marine and onshore habitats may occur due to the proposed increase in training activities and detonations in the intertidal, subtidal and upland. This may cause a reduction in habitat suitable for native species distribution especially as it relates to eelgrass on the bayside training range and onshore sensitive bird breeding, roosting, and foraging habitat. | The individual effects analyses of military activities (short-term and long-term) are presented in their individual sections, where the potential impacts are discussed in detail. The determinations of the impacts of military activities are also presented there. The cumulative impacts section discusses the impact on the environment that results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions, regardless of what agency (federal or non-federal) or person undertakes such other actions. The applicable impact analyses from the Environmental Consequence sections have been carried forward into the cumulative impacts discussion. Potential impacts on or fragmentation of marine and offshore habitats is unlikely based on the temporal and spatial frequency of physical disturbance from wind and wave action along SSTC offshore beaches, relative to the Proposed Action. Detonations only occur underwater in the oceanside boat lanes (with the exception of Shock Wave Generator , which occurs in bayside training area Echo). Underwater detonations were evaluated in Section 3.7.2.2.2 of the FEIS for all benthic invertebrates. Impacts to eelgrass habitat within the bay are addressed within the current analysis and mitigation measures are identified. Furthermore potential impacts to sensitive bird species are already monitored by the Navy, and SSTC birds have displayed positive trends compared to similar areas within California. Moreover, the restriction of public access from portions of SSTC beaches likely benefits coastal dune and upland habitat continuity to a greater degree than intermittent training activities cause fragmentation. Habitat conversation remains a focused effort of Navy natural resource personnel. |

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| 180. | California Department of Fish and Game | There are known Pismo clam, *Tiveta sfultorum*, beds near SSTC-North and South training ranges that are surveyed by the Department every year. Invertebrates are an important part of near shore and beach ecology. In particular, Pismo clams, a state managed and sensitive species, tend to develop high concentrations or beds on flat beaches in the surf zone and at the mouths of bays, rivers and estuaries. This makes them more susceptible to Navy vehicle training, detonations or burial impacts. Impacts to Pismo clams, as well as other concentrations of marine invertebrate species, should be identified, monitored and mitigated. The DEIS should have addressed the potential for these types of impacts. | During the analysis of potential impacts to benthic infauna, various clam species were assessed for impacts, as described in Section 3.7.2.2 of the FEIS. The best available data for SSTC training beaches were used, and impacts to invertebrates and subtidal habitats have been discussed. Impacts of training activities taking place within the washzone habitat above the Mean Low Water mark were determined to have a low potential for eliciting adverse effects to marine benthic infauna. Additionally, underwater detonations were evaluated in 3.7.2.2.2 of the FEIS for all benthic invertebrates. |
| 181. | California Department of Fish and Game | Sea level rise should be analyzed and addressed in the FEIS as a potential cumulative impact to unique and dwindling coastal strand habitat, eelgrass habitat and bird nesting habitat on beaches in southern California. | Climate change is addressed in Section 4 of the FEIS as a cumulative impact on the public and the environment to which the Proposed Action would make an insignificant contribution. Because the purpose of the EIS is to address the effects of the Proposed Action on the public and the environment, the effects of sea level rise on the Proposed Action are not addressed in the FEIS. While sea level rise was not specifically addressed, the proposed training activities do not require any fixed facilities that would require protection or relocation. The primary effect of sea level rise on Navy training activities on SSTC would be a decrease in the width of the training beaches. Ground access to the beaches and local weather conditions might also be affected. |
| 182. | California Department of Fish and Game | 2) Concerns and Recommendations related to Potential Cumulative and Long term Impacts: Since the property leased by the Navy at SSTC-North is state-owned property and SSTC-South and bayside is adjacent to Silver Strand State Beach, the Department expects that a higher level of adherence to standard practices, as well as proposing additional mitigation and conservation measures for protecting sensitive coastal ecosystems and biological communities, will be practiced by the Navy as the tenant and neighbor of such land. The following comments and recommendations should be considered and addressed in the FEIS: | Sensitive coastal ecosystems are delineated by the Navy as part of assessing snowy plover and California least tern nesting habitat. Standard practices related to construction and training activities regularly create avoidance areas focused on minimizing long-term impacts and reducing cumulative effects. |

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| 183. | California Department of Fish and Game | Mitigation for 1.13 acres of eelgrass habitat loss is proposed in the DEIS based on Navy estimates. An enhanced monitoring and surveying program is recommended for the remaining eelgrass habitat that may be adversely affected before, during and after the proposed training activities and construction. The Department is concerned that the actual impacts to eelgrass and eelgrass habitat in this area may be significantly higher at the bayside Navy training range due to cumulative or long term impacts of proposed increased training. | Besides the Navy Eelgrass Mitigation Sites, the Navy maintains permanent eelgrass monitoring transects in San Diego Bay that are monitored every year (Figure 3.7-9). Bay wide mapping of eelgrass density classes is conducted every three to five years in a joint Navy-Port of San Diego effort (1994, 1999/2000, 2004, and 2008). The most current (2008) data were recently made available (DoN, 2009). This monitoring program allows the Navy to track fluctuations in the coverage, extent, and health of eelgrass in San Diego Bay. |
| 184. | California Department of Fish and Game | Monitoring plans that incorporate adaptive management for developing marine wildlife and habitat conservation measures are recommended. Monitoring plans should be developed in collaboration with the resource agencies. Experienced and qualified independent biologists should be retained to adequately implement the biological monitoring and studies. | Monitoring plans and existing mitigation measures are presented in sections 3.7 through 3.12 of the FEIS, as well as an independent chapter in Section 5. These mitigation and monitoring plans have been created with the assistance of and in consultation with resource agencies such as National Oceanic and Atmoshperic Administration and U.S. Fish and Wildlife Service. |
| 185. | California Department of Fish and Game | The Department recommends marking and avoiding all western snowy plover and California least tem nests and any suitable nesting habitat to offset impacts to these species that may occur as a result of the disturbances and activities (e.g., foot and vehicle traffic) associated with military training exercises. | The Navy will develop a marking strategy to delineate least tern and snowy plover nesting areas that do not encumber training activities. Such a marking strategy would provide visual references identifying sensitive nesting areas and may entail signage affixed to existing beach lane signposts and a limited number of additional markers, as determined appropriate by Navy staff.<br><br>As indicated in the USFWS Biological Opinion and described in the FEIS, the Navy will improve the delineation of base boundaries to facilitate improved enforcement in these areas. This measure will include the installation of improved signage, k-rails, and a guard shack. At SSTC-N, temporary barriers and improved signage will be used to more clearly notify the public of the Navy's exclusive use of SSTC-N beaches and existing restrictions on public use of those beaches. Please see FEIS Section 2.1.3.7 for a detailed explanation of why more than 22 concurrent western snowy plover nests would impede proposed military training at SSTC. Restrictions imposed by |

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| | | | stakes during training may lead to habitual avoidance measures and self-imposed concentrations of personnel, even in a combat environment, due to repetitious training with excessively staked boundaries. Personnel may habituate to worrying about avoiding stakes, even while they are fighting at war. Personnel may also focus on the stakes and no-go areas rather than learning their training mission. Historically, SSTC has typically had less than 22 maximum active nests at one time. With the anticipated increase in training tempo of the SSTC training beaches (see Sections 1.5.1.1 and 3.12.3.1), training activities may not be able to be moved to other less encumbered beach lanes like they can be under current conditions. |
| 186. | California Department of Fish and Game | Existing buffer zones and signs to designate sensitive habitat (e.g., for California least tern and western snowy plover) should continue and be increased in the future for the proposed training increases on State property. | Under current training conditions, Navy training officers are notified of the locations of the nests and buffers, and plan their training activities to avoid entering the buffer areas. A few training activities, such as individual basic physical fitness activities, may be able to work around the training buffers. These activities incorporate identifying and avoiding plover nest buffer areas into the activity. Other training does not require use of beach areas, and thus would not be affected by the presence of plovers. Most other activities however, are unable to operate around the buffers. The buffers are artifacts on the beach that do not occur in real world wartime situations, and thus adversely affect the value of training (e.g., presence of the plover nests restricts flexibility for maneuvering across the beach and inhibits real-time, tactical decision-making). Activities involving heavy equipment and vessels require large, unconstrained maneuvering space, precluding the use of areas with buffered plover nests. To accommodate training requirements for these activities, the activities are often shifted to the north or south, far enough away from the buffers so that personnel and equipment will not encounter or see the buffers and stakes. Under current conditions, this approach is feasible. Where needed, training activities can and are moved to other available training lanes that are free of plover nests or contain |

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| | | | a maximum of two plover nests at one time.<br><br>The Navy will develop a marking strategy to delineate least tern and snowy plover nesting areas that does not encumber training activities. Such a marking strategy would provide visual references to identify sensitive nesting areas, and may entail signage affixed to existing beach lane signposts and a limited number of additional markers, as determined to be appropriate by Navy staff. |
| 187. | California Department of Fish and Game | The project should include a vehicle route plan that sufficiently avoids and minimizes impacts to sensitive species and habitats. The vehicle route plan should include, but not be limited to, the following areas: a) pismo clam beds and grunion nests; b) identified sensitive bird breeding, roosting, and foraging habitat and other significant biological areas of the intertidal, strand, and dunes; and c) beach wrack and eelgrass. | Under current training conditions, Navy training officers are notified of the locations of the nests and buffers, and plan their training activities to avoid entering the buffer areas. Vehicle use that could adversely affect Pismo clam beds are constrained to large amphibious vehicles accessing beach slopes within training lanes from nearshore waters. Because of the variability of the proposed training activities, and based on the temporal and spatial variability of clam beds as well as grunion spawning areas, an excessive amount of monitoring would be required to develop avoidance areas. SSTC beaches are high-energy, physically disturbed environments that incur dynamic change with respect to wave action and sand movement on both weekly and seasonal bases. Potential impacts of training activities on infaunal species such as clams and benthic invertebrates would be difficult to measure and would not affect foraging avian fauna or fish.<br><br>As a result of the Essential Fish Habitat consultation with NMFS, The Navy will conduct April to May pre-event surveys for grunion prior to SSTC training events that could to disturb intertidal beach areas (Causeway Pier Insertion and Retraction training (max. of 10 per year), and ELCAS (max. of four per year). For events that have a requirement to occur in April and May, the Navy will use predicted grunion spawning periods obtained from the California Department of Fish and Game (http://www.dfg.ca.gov/marine/grunionschedule.asp ) to anticipate times to survey 10-14 days prior to the next ELCAS |

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| | | | or Causeway Pier Insertion and Retraction. This survey will identify if grunion spawning occurred or did not occur on the beach area scheduled for training. If grunion spawning is documented, then a determination on the spatial extent of spawn across the planned training area and magnitude of spawning will be made. For cases in which a significant spawning run is observed coincidental with and at the same location as a planning training event, the Navy will make every attempt possible to laterally shift the training to avoid the deposited grunion eggs to the best extent practical. |
| 188. | California Department of Fish and Game | Helicopters flying over actively-nesting California least terns and western snowy plovers should stay at least 500 feet above the ground to avoid flushing adults off the nest and leaving the eggs and chicks vulnerable to predation. | California least terns have persisted, nested, and their populations expanded parallel to Navy activities for many years. Currently California least terns nest on the runway at Naval Base Coronado, where supersonic jets takeoff and land regularly. This is a high ambient noise environment in which nesting persists. The Navy has nesting success adjacent to the North Island airfield, which is a very high noise environment. Western snowy plovers have not been documented to flush from occupied nests during aviation operations, and western snowy plover's typically move only a short distance on the ground when not directly disturbed by ground based activities. The FEIS addresses noise and its effects on the least tern and snowy plover.<br><br>The mixture of civilian, military, and commercial aviation makes for complex airspace traffic patterns and procedures. The NBC Commanding Officer has established air operations course rules for Naval Air Station North Island and the Naval Outlying Landing Field (NOLF, note - formerly known as Ream Field) to conduct safe required training and operational flights while minimizing impacts on the surrounding community. These course rules are designed to promote safe air operations, meet Navy aviation training requirements, and protect communities beneath established flight paths. Pilots are given annual course rule briefs to ensure their familiarity with course rules, procedures, and noise abatement measures. |

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| | | | Currently published air operation instructions (course rules) advise pilots when departing NOLF westward to either fly 1/4 mile south of beach houses or cross over beach houses at or above 800 feet above mean sea level (300 feet above the Federal Aviation Administration's minimums set in Federal Aviation Regulation 14 CFR Part 91, see reference below) until they are near the communication station (old Navy Radio Receiver Facility). Weather conditions, other aircraft in the flight patterns, etc. can and do affect the aircraft's flight route and altitude. Federal Aviation Regulation 14 CFR, Part 91 Section 119, titled *Minimum Safe Altitudes*, Paragraph d indicates that helicopters may be operated at less than the following minimums prescribed for other aircraft, e.g. over congested areas, 1000 feet above the highest obstacle within a horizontal radius of 2000 feet of the aircraft, and over other than congested areas 500 feet above the surface. Helicopters in SSTC training primarily support offshore training and , when involved with SSTC-S inland training, are not permitted to hover over beaches but may transit over the beach at altitudes less than 500 feet altitude as required by the training curriculum. |
| 189. | California Department of Fish and Game | To assess impacts of training activities on the California least tern and western snowy plover, the Department recommends annual documentation of the distribution of California least terns and western snowy plovers at SSTC-N in relation to the timing, number, type, and distribution of training activities in each training lane during the breeding seasons for these sensitive species. | As indicated in the USFWS Biological Opinion (July 7, 2010). the Navy will include the following information in the yearly reports to be submitted to the USFWS in conjunction with the Proposed Action: a) the numbers and distributions of terns and plovers observed in each training lane; b) the numbers of any dead or injured least terns or snowy plovers (including eggs, chicks or adults) observed in each training lane; c) the hatching rates of terns and plovers in each beach lane; d) maps of the locations of tern and plover roosts within the action area; e) the timing and number of training events within the southern 3 beach lanes, and other beach lanes, to the extent available; f) the date and condition of any dead or injured tern or plover; and d) any measures taken to prevent additional tern or plover death or injury. The Navy will ensure that biological monitors look for and document the locations of least tern or |

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| | | | snowy plover nests, eggs, and chicks prior to and after all military training exercises, to allow for assessment of the take associated with training activities. |
| 190. | California Department of Fish and Game | The Department recommends increased enforcement of civilian and non-training trespass at SSTC-N to reduce impacts to the California least tern and western snowy plover. | As indicated in the USFWS Biological Opinion and described in the FEIS, the Navy will improve the delineation of base boundaries to facilitate improved enforcement in these areas. This delineation will include the installation of improved signage, k-rails, and a guard shack. At SSTC-N, temporary barriers and improved signage will be used to more clearly notify the public of the Navy's exclusive use of SSTC-N beaches and existing restrictions on public use of those beaches. |
| 191. | California Department of Fish and Game | The Department recommends that the FEIS address the potential occurrence of Pacific pocket mouse and coast horned lizard, and the potential for tong-term conservation of these species on-site. | A survey for the Pacific pocket mouse *(Perognathus longimembris pacificus)* was performed at SSTC-S in 2002 using USFWS trapping protocol (USFWS 2000). It was not detected. Four transects were completed on-site within vegetation communities that exhibited suitable sandy soil conditions. Surveyors reported that the species is not expected to occur at SSTC-S due to lack of suitable habitat (RECON 2004). The Navy will continue to survey for this species during future biological inventories. Due to possible future training requirements, it is the Navy's position that Threatened and Endangered species not be experimentally introduced to unoccupied habitat.<br><br>A survey for the coast horned lizard (*Phrynosoma coronatum blainvillii*) was also performed at SSTC-S in 2001-2002 (RECON 2004). It was not detected, and the surveyors attributed this result to a lack of suitable habitat. The survey assessed the remnant coastal sage scrub patches, and found them to be too small to support a population of this species, |

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| | | | and no native harvester ant forage (*Pogonomyrmex* sp.) was found. |
| 192. | California Department of Fish and Game | Grunion season monitoring and avoidance/minimization strategies should include but are not limited to the following:<br>a. When grunion monitoring surveys indicate grunion habitat exists on site, and significant grunion runs are seen, avoid sand disturbing activities during the grunion spawning season. The Grunion spawning season is typically March 1st to August 31st.<br>b. If avoiding the grunion spawning season is not feasible, then the Department recommends development of spawning and egg avoidance, minimization and monitoring plans for significant spawning events on site.<br>c. Predicted grunion spawning runs should be monitored prior to, during and post training or construction by a qualified grunion biologist.<br>d. Avoid sand disturbing activities in the intertidal areas during the two-week incubation period after significant spawning runs are seen. Subsequent monitoring should also indicate that no additional spawning has occurred before proceeding with sand disturbing activities. Identifying and marking grunion nests and use of buffer zones is another avoidance option.<br>e. In order to determine significant grunion spawning on the beach,<br>monitoring plans should generally include four nights of monitoring with the first night being the night of the new or full moon. At least two hours of monitoring, the first day to begin after the peak high tide and the 2nd, 3rd and 4th days of monitoring should begin at least one-half hour before peak high tide. Two hundred grunion or more seen over the four day predicted spawning run beginning with the night of the new or full moon should be sufficient to indicate significant spawning activity. | Beaches from Zuniga Jetty to the Mexican border, including SSTC training areas, are potential grunion habitat. Considering the temporal and spatial variability of local populations, in conjunction with their dependence on moon phases and tidal cycles during spawning, the potential for adverse impacts from dispersed training activities was considered to be extremely low. As a result of the EFH consultation with the NMFS, the Navy will conduct a new bottom habitat mapping survey to more accurately detail potential habitat types (ex., sand, cobble, rocks) within the oceanside SSTC boat lanes. This effort, scheduled to begin in 2011, is designed to update bottom type classification at finer resolution and spatial scales than previous California State funded surveys from 2002. The goal of this Navy funded survey would be to provide information to NMFS on habitat types within SSTC, and to Navy commands conducting underwater detonations at SSTC for consideration in selection of appropriate bottom-laid detonation sites.<br><br>The Navy will conduct April - May surveys for grunion prior to SSTC training events that could to disturb intertidal beach areas. For events that are required to occur in April and May, the Navy will use predicted grunion spawning periods obtained from the California Department of Fish and Game (http://www.dfg.ca.gov/marine/grunionschedule.asp) to anticipate times to survey 10-14 days prior to the next ELCAS or Causeway Pier Insertion and Retraction. This survey will identify if grunion spawning occurred or did not occur on the beach scheduled for training. If grunion spawning is documented, then a determination on the spatial extent of spawn across the planned training area and magnitude of spawning (on the standard grunion 0-5 spawning scale) will be |

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| | | | made. For cases in which a substantial spawning run is observed (4 or 5 on the spawning scale) coincidental with and at the same location as a planning training event, the Navy will attempt to laterally shift the training to avoid the deposited grunion eggs to the greatest extent practical. If such a shift cannot be made due to schedule conflict over multiple SSTC boat and beach lanes, logistic requirements to use a specific lane or area within a lane that precludes a shift, or safety considerations (ex., weather conditions, sea state), then the Navy will inform NMFS Southwest Region that training was conducted on that site for the specified reason. |
| 193. | California Department of Fish and Game | 3) Conservation Planning for Future Impacts to Listed and sensitive Marine and Terrestrial Species and their Habitats.<br>The Department recommends that existing methods and criteria to designate species buffer zones and sensitive habitat should be revised to provide adequate fish and wildlife protection in order to accommodate the Navy's future proposed activities on and adjacent to state property located at SSTC-North and South and the Bayside. Such proposals should be approved by the resources agencies. | Please see response to other portions of your letter (above) for a discussion of buffers with respect to federally listed birds. With implementation of the Proposed Action, losses in California least terns and western snowy plover nesting are expected to be minimally increased from baseline levels. The Navy and U.S. Fish and Wildlife Service (USFWS) have established mitigation measures to compensate for these losses. The Navy has consulted with the USFWS under Section 7 of ESA for the Proposed Action, and received a Biological Opinion.<br><br>The NBC Integrated Natural Resources Management Plan is a venue in which the Department may partner with the Navy in developing further management strategies. |
| 194. | California State Parks | California State Parks (CSP) appreciates the U.S. Department of the Navy (Navy)'s commitment to resource conservation in the southern San Diego region. This commitment is particularly evident with respect to conservation of California least tern and Western snowy plover. CSP appreciates the effort put into the Silver Strand Training Complex Draft Environmental Impact Statement (Draft EIS), including its documentation of our region's natural and cultural heritage and its review of the complex responsibilities charged to the Navy. CSP has several concerns with the proposed project with respect to sensitive species conservation, adequate mitigation for impacts to sensitive species, lack of specificity concerning increased presence of emissions and hazardous materials, and potential impacts to marine life within the adjacent off-shore property that is considered part of Silver Strand State Beach. This letter also includes comments on cultural resources for lands adjacent to park holdings, and questions the effects of increased ground and air traffic on the experience of visitors at Silver Strand State Beach. | Figures and text have been updated with "Silver Strand Natural Preserve". The document recognizes the SSNP and the extent of the offshore boundaries.<br><br>Regarding ownership of boat lanes 3-10, the Navy recognizes that California owns the fee in the tide and submerged lands from the 1941 Mean High Tide Line out to three nautical miles and that the California State Lands Commission administers and controls this land, subject to a lease to the United States and a reversion in State Parks. The reversion to State Parks is effective upon the expiration or earlier termination of the 1982 lease. The term of the 1982 lease is 40 years – or until August |

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| | | The Draft EIS proposes:<br>• the continuation of current training and test and evaluation activities conducted within the study area;<br>• an increase in training tempo from baseline conditions and additions to types of training;<br>• the carrying out of existing, routine training at additional locations within SSTC established training areas;<br>• the introduction of new platforms and equipment;<br>• increased access and availability to existing beach and inland training areas.<br><br>Noted in section 3.1.1.5.2 SSTC-N Surrounding Land Use, and elsewhere throughout the document, the text and figures incorrectly refer to "Silver Strand State Park", instead of the correct title of "Silver Strand State Beach". In addition, the document omits recognition of the Silver Strand Natural Preserve. A Natural Preserve is a CA State land designation used to identify the presence of highly significant natural resources. CSP feels that the Draft EIS should include specific mention of this land designation and also, where appropriate, denote its boundaries in figures within the document. Similarly, the Draft EIS should note the extent of marine area managed by CSP. California State Parks holds fee title to off-shore lands, 3 miles out, that include, roughly, boat lanes 3 through boat lane 10 and extends to the southern end of Silver Strand State Beach. CSP should be both considered and listed as an "affected jurisdiction" on the EIS Cover Sheet, and throughout the document as a whole. | 31, 2021. Regarding ownership of boat lanes 3-10, the Navy has a determinable fee in the submerged lands from the Mean High Tide Line out to three nautical miles, subject to a reversion in the State of California if the lands are no longer needed for government purposes, which expires in August 31, 2021.<br><br>The Navy, as a federal agency, analyzes the potential environmental impacts of its proposed actions under NEPA. CEQA applies to the discretionary actions of California State public agencies. The actions proposed within this EIS require no new leases of land from the State; and there are no other anticipated State or local agency discretionary actions that would trigger a CEQA review. However, if a real estate action, such as a lease, is determined to be in the best interests of the Navy and the State, the State may be required to conduct a CEQA review of the lease agreement. If the State needs to conduct a CEQA analysis, the Final EIS may be referenced in the State's CEQA analysis.<br><br>Under the Commerce Clause, Article 1, Section 8 of the U.S. Constitution, the federal government is conferred a "dominant servitude" over navigable waters and the underlying land. Exercise by the federal government of this Constitutional power is not an invasion of any property rights in the water or underlying lands and is not a taking of property within the meaning of the Fifth Amendment. None of the actions proposed below the ordinary high water mark create permanent fixtures or permanent attachments to the underlying land. It is the Navy's position that the federal actions proposed in this EIS create no obligation to enter into real estate leases or agreements with the State owners of lands underlying these navigable waters. |

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| 195. | California State Parks | CA State Parks understands that the Navy must allow for a significant level of flexibility when forecasting training needs, however we also feel that take of endangered species should be avoided or mitigated appropriately. The proposed expanded use of the training grounds, especially Beach Blue 2, Beach Orange 1, and Beach Orange 2, will most likely result in take of California least tern and Western snowy plover, and deter and disrupt current levels of nesting. CSP feels that the proposed mitigation for this take offered in the Draft EIS is inadequate to meet the standards of the U.S. and California State Endangered Species legislation. The Draft EIS lacks specificity with respect to training activities to adequately quantify potential take of protected species. Therefore, identification of an appropriate mitigation agreement prior to project implementation is difficult. Although options exist for additional on-site mitigation and avoidance, and those options should be further explored, we offer the following suggestions for a potential off-site mitigation scenario:<br><br>1. Commit to increased level of avian monitoring necessary to accurately quantify take of tern and plover resulting from the proposed actions in the Draft EIS.<br>2. Continue consultations with USFWS to develop an adaptive management agreement in which take of tern and plover is appropriately mitigated through suitable actions. Based on the success the U.S. Navy has had with the establishment of the 75-acre preserve at Delta North and South, it seems that a similar mitigation scenario could offer the appropriate long-term mitigation. Opportunities exist in the region for creation of additional off-site nesting locations.<br><br>It is the understanding of CSP that the Navy's current Western snowy plover avoidance protocol involves the buffering of each snowy plover nest that is located during the breeding season. The Draft EIS proposes to reduce this management action such that only 22 concurrent plover nests are buffered. This proposed decrease in avoidance measures, when coupled with the proposed increase in training, presents a management scenario in which take of Western snowy plover, above current levels of take, seems likely. The Draft EIS does not appear to include adequate mitigation for this increased take of Western snowy plover. | With implementation of the Proposed Action, losses in California least terns and western snowy plover nesting are expected to be minimally increased from baseline levels. The Navy and U.S. Fish and Wildlife Service have established mitigation measures to compensate for these losses. The Navy has consulted with the U.S. Fish and Wildlife Service under Section 7 of ESA for the Proposed Action, and received a Biological Opinion on July 7, 2010.<br><br>In response to this and other comments received, the Navy has revised the EIS analysis on the California least tern (Section 3.12.3.1) and the western snowy plover (Section 3.12.3.2) to provide a more in-depth analysis of impacts that training is expected to have on the species. Additional analyses have been provided on the indirect and direct impacts of current and proposed military training, to include both an average anticipated impact as well as a high-intensity anticipated impact. Additional mitigation measures have been incorporated into the Proposed Action. The benefits of current and proposed mitigation are also described and quantified to the extent practicable. As discussed in the analysis, the benefits of mitigation are expected to outweigh potential adverse impacts of training. The Navy has consulted with the USFWS, and received a Biological Opinion for take of the listed species associated with military training.<br><br>The FEIS addresses the level of loss anticipated under the No Action Alternative compared to Alternative 1, estimated to be an increase of seven nests, on average, in a typical year.<br><br>As described in the FEIS and the U.S. Fish and Wildlife Service Biological Opinion, the Navy will implement a mitigation measure to schedule training in areas where less nesting occurs when possible and still meet training needs. In addition, the Navy will schedule training activities that could be conducted on the hardpacked portion of the beach during low tides when it is consistent with training needs. The Navy |

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| | | | will develop a marking strategy to delineate least tern and snowy plover nesting areas that do not encumber training activities. Such a marking strategy may entail signage affixed to existing beach lane sign posts and a limited number of additional markers, as determined appropriate by Navy staff. The Navy will include the following information in the yearly reports to be submitted to the U.S. Fish and Wildlife Service under the proposed action: a) the numbers and distributions of terns and plovers observed in each training lane; b) the numbers of any dead or injured least terns or snowy plovers (including eggs, chicks or adults) observed in each training lane; c) the hatching rates of terns and plovers in each beach lane; d) maps of the locations of tern and plover roosts within the action area; e) the timing and number of training events within the southern three beach lanes, and other beach lanes, to the extent available; f) the date and condition of any dead or injured tern or plover; and d) any measures taken to prevent additional tern or plover death or injury. The Navy will ensure that biological monitors look for and document the locations of least tern or snowy plover nests, eggs, and chicks prior to and after all military training exercises, to allow the assessment of take associated with training activities.<br><br>Finally, the Navy's Proposed Action includes: ongoing nesting site preparation at the Delta Beaches; predator management; population monitoring; a Long Term Habitat Enhancement Plan; and measures to eliminate unauthorized recreational trespass, which are all conservation measures that support the recovery of the least tern. The Navy expects implementation of these conservation measures to maintain the suitability of least tern habitat within the action area over the long term. The Navy's actions will increase the capacity of oceanside beaches and the Delta beaches to accommodate least terns and snowy plovers. |

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| 196. | California State Parks | CSP ownership at Silver Strand State Beach extends 3 miles out to sea. This off-shore portion of Silver Strand State Beach generally includes Boat Lanes 3 through 10 and is adjacent to Boat Lane 11, which immediately borders Silver Strand SB to the south. The EIS fails to adequately consider the effects on this area or proposed appropriate mitigation of its actions. This area was created to ensure the public's continued enjoyment of the coastal marine environment. It is the Navy's responsibility, as part of the EIS, to delineate this state ownership and to evaluate the EIS proposals' potential effects on the public's use of this off-shore area.<br><br>In addition, the 3-mile marine area is eligible to be designated as a State Marine Protected Area. While CSP appreciates the consideration of marine life already included within the Navy's protocol for disruptions to the under-water acoustic environment we are concerned that existing activity and increases proposed in the Draft EIS will result in additional harm to marine life that use waters managed by CSP. CSP requests that activities involving acoustic disturbances known to damage marine life (pile driving, underwater detonations, SWAG operations, blasts, pyrotechnics, etc.) be located at distances far enough from ocean waters managed by CSP such that impacts to resources within these waters are avoided. | Regarding ownership of boat lanes 3-10, the Navy recognizes that California owns the fee in the tidal and submerged lands from the 1941 Mean High Tide Line out to three nautical miles and that the California State Lands Commission administers and controls this land, subject to a lease to the United States and a reversion in State Parks. The reversion to State Parks is effective upon the expiration or earlier termination on the 1982 lease. The term of the 1982 lease is 40 years – or until August 31, 2021. The Navy has submitted a Coastal Consistency Determination to the California Coastal Commission and received a conditional concurrence from the Commission.<br><br>The analysis in Section 3.1 – Land Use, analyzes the public lands on all borders of the range complex. SSSB and the SSNP are part of the public lands that surround SSTC, and the public would be able to continue to use public beach adjacent to active training.<br><br>The Navy has analyzed all marine communities located offshore and nearshore from SSSB and SSNP in Section 3.7.2.2 of the SSTC EIS, and has also submitted an Essential Fish Habitat assessment to NMFS. The conclusions reached in the EIS and the Essential Fish Habitat assessment indicate that effects are temporary and localized, and without impact to overall biotic assemblages.<br><br>The current locations of White and Purple lanes reflect the locations of these lanes as portrayed on NOAA Chart 18772. No Navy records have been found that identify when the lanes were designated. The locations of these lanes can be corrected by submitting a request to NOAA with corrected latitudes and longitudes. However, the Navy does not conduct amphibious training activities on the State Beach portion on this boat lane. |

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| 197. | California State Parks | Current and increased naval activity in SSTC South, particularly in Beach White 1 and Beach White 2, may result in disturbance to Western snowy plover dependent upon protected habitat within the adjacent Silver Strand Natural Preserve, managed by CSP. CSP requests that the Navy inform CSP staff of training activities in this region such that CSP staff can accurately monitor potential impacts from these adjacent land uses. If negative effects are documented, CSP requests that the Navy work with CSP and USFWS to mitigate these negative effects. | The Navy has consulted with the USFWS, and has received a Biological Opinion (signed July 7, 2010) for take of the listed species associated with military training; the BO includes appropriate avoidance, minimization, and mitigation measures. The Navy will not add CSP to the list of entities that are alerted when training activities are anticipated because the Navy has consulted with the USFWS on take and appropriate minimization, avoidance and mitigation measures. The Navy's consultation has also identified appropriate monitoring for the species, which is detailed in Section 3.12 of the FEIS.<br><br>As part of the conditions of the Biological Opinion, appropriate monitoring for the species was identified. The Navy will include the following information in the yearly reports to be submitted to the USFWS under the proposed project: a) the numbers and distributions of terns and plovers observed in each training lane; b) the number of any dead or injured least terns or snowy plovers (including eggs, chicks or adults) observed in each training lane; c) the hatching rates of terns and plovers in each beach lane; d) maps of the locations of tern and plover roosts within the action area; e) the timing and number of training events within the southern three beach lanes, and other beach lanes, to the extent available; f) the date and condition of any dead or injured tern or plover; and d) any measures taken to prevent additional tern or plover death or injury. The Navy will ensure that biological monitors look for and document the locations of least tern or snowy plover nests, eggs, and chicks prior to and after all military training exercises, to allow the assessment of take associated with training activities. |

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| 198. | California State Parks | CSP appreciates the Navy's assistance with the clean-up of expended materials that occasionally wash to shore on SSSB and the SSNP. CSP is concerned that some of the activities proposed in the Draft EIS will result in additional occurrences of munitions constituents and other expended materials on the public beaches managed by CSP. CSP requests that the Navy continue this cooperation and allow for increased communications and response for clean-up of future expended materials found on SSSB and SSNP. Additionally, CSP requests that Navy staff work with CSP interpretive staff to identify interpretation needs and public education and outreach necessary to protect the visiting public and CSP staff from these potential dangers. | Most of the training materials used at SSTC are non-hazardous, or are rendered non-hazardous when they function as designed (e.g., blanks). Trainees collect and remove expended materials to the extent practicable at the conclusion of their training events. Very rarely, energetic training munitions may not function as designed, resulting in their temporary presence until promptly retrieved by Navy personnel. The incidence rate of expended items that would pose a risk to the public is so low that a public education and outreach program is not warranted. |

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| 199. | California State Parks | CSP is concerned that the activities proposed in the Draft EIS will result in Naval activity (training exercises, aircraft fly-over, beach landings, traversing from SSTC North and SSTC South, etc.) on or over SSSB and SSNP. CSP is a public safety agency and as such is committed to protecting the resources and visitor experience on these beaches. CSP requests that any desired increased use of CSP-managed lands be approved by the CSP San Diego Coast District Superintendent prior to initiation. | The only activities that occur on SSSB or SSNP are physical training activities which include running and swimming. The physical activities performed in this area are the same as those done by the public. No landings, aircraft overflights, or other high-intensity activities use these two areas.<br><br>The Navy appreciates CSP's dedication to maintaining public safety and a positive experience for visitors to SSSB and SSNP. As cooperative neighbors, the Navy intends to maintain the same respect for SSSB and SSNP lands as for Navy-owned or leased lands. The only activities that occur on SSSB or SSNP are physical training activities which include running and swimming.<br><br>The Navy has a determinable fee in the submerged lands from the Mean High Tide Line out to three nautical miles subject to a reversion in the State of California if the lands are no longer needed for government purposes, which expires in August 31, 2021.<br><br>Additionally, the Navy recognizes its proximity to adjacent communities, and has attempted to structure its training activities to achieve operational readiness while minimizing potential impacts to the surrounding area. In light of this proximity, the Navy has developed mitigation measures for activities that may cause an impact to the environment or the surrounding area, and has presented these measures in the EIS. |

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| 200. | California State Parks | The natural landform and habitat present within SSTC South is extremely unique and regionally rare. The Draft EIS proposes increased impacts to this valuable resource but fails to propose adequate mitigation. The proposed training in the vernal pools exemplifies this oversight. Every effort should be made to protect the vernal pool resources and other unique habitat elements found in SSTC South. Proposed activity within the vernal pools when dry has the potential to disrupt the soil integrity and the long-term sustainability of this habitat, the plant life and the San Diego fairy shrimp that occupy this niche. If the Navy must increase training within the sensitive habitats of SSTC South, the impacts should be quantified and appropriate mitigation measures should be undertaken. | The Navy will use scheduling and other planning tools to minimize impacts to vernal pools. The Navy will avoid the occupied vernal pools and their watersheds adjacent to the road at SSTC-S Inland (i.e., pools 1 through 7 marked with flexi-stakes) year-round to the maximum extent consistent with training needs. Foot traffic when the pools are dry consists primarily of small groups. As presented in Section 3.11 of the FEIS, trail forming and soil compaction are unlikely, resulting in no impact to population viability. Additionally, the Navy has completed consultation with the USFWS, and has received a signed Biological Opinion which concludes that proposed training activities will not jeopardize the continued existence of San Diego fairy shrimp.<br><br>As part of the conditions of the Biological Opinion, the Navy will be completing a Vernal Pool Management and Monitoring Plan to help determine whether the impacts identified in the EIS remain at the low levels expected. The Plan will include a focused invasive plant inspection survey in the pools and their watersheds; plant, topographic, hydrological, and water quality surveys (including salinity); and protocol fairy shrimp surveys. In addition, the Navy will be determining the baseline distribution and abundance of San Diego fairy shrimp and the condition of the vernal pool habitat prior to initiating training activities in or around the vernal pools at SSTC-S Inland. If impacts are more substantial than the low levels anticipated or if impacts could lead to the extirpation of fairy shrimp from any individual pool, then the Navy will reinitiate consultation with the USFWS. |

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| 201. | California State Parks | Table 3.3-4, "Operational Emissions at SSTC and Portions of NASNI with Evaluation of Conformity" reports emissions increases of monitored pollutants at levels anticipated to be up to nearly 4 times the 'No Alternative' emissions estimation. Additionally, the Draft EIS mentions hazardous air pollutants (HAP's) but provides inadequate data for assessment of the current level of HAP's emitted by Naval activities and anticipated proposed increases. Given these proposed increases, and the apparent lack of data on HAP's, CSP feels that the Navy should increase its commitment to monitoring and reporting air pollutants throughout the region to all affected jurisdictions. Specific attention should be directed toward supplementing existing monitoring protocols with sampling stations and efforts that allow the Navy to identify the contribution of Naval-generated emissions, including HAP's, long-term, and to mitigate appropriately when necessary. | The Navy has a comprehensive air quality management program that includes monitoring and mitigation for Naval-generated emissions, including HAPs. Mitigation measures that are part of the Navy's air quality management practices are implemented at SSTC. Aircraft, marine vessels, ground vehicles, and military equipment are well-maintained, and meet applicable air emission standards (such as smog certification for on-road vehicles) in accordance with State requirements. Section 3.3 and Appendix C analyze the pollutant emissions from the training activities presented in the EIS and indicate that the emissions from all training activities are within air quality standards. |
| 202. | California State Parks | The Draft EIS contains a fairly extensive write-up on the policies, plans and regulations that govern the management of hazardous materials at SSTC however, given the relatively short public review period, an adequate review of these reference materials was not possible. The Draft EIS does note that, under the Preferred Alternative, the amounts of expended training materials would increase, the weight of expended flare and smoke canister residues would increase and the amounts of residues from detonations of underwater explosives would increase. The EIS would benefit from a more specific discussion of the updated offshore petroleum discharge system (ES9). CSP is concerned with the health of the environment for the park visitors, State Park staff, local public, and the sensitive natural resources living in this region. Review of this section would be facilitated by the inclusion of data from studies that have evaluated of levels of hazardous materials in the local environment with particular inclusion of effects on sensitive receptors. CSP feels that, with the proposed increases in expended materials, the Navy should clearly outline and commit to a testing and evaluation protocol designed to identify the degree to which hazardous materials mayor may not be emitted through the SSTC operations, and the levels at which they are accumulating in the local environment. Additionally the Draft EIR states that the Navy submits EPCRA 312, Tier 'II forms to the emergency responders (Fed Fire) and the San Diego County Certified Unified Program Agency (CUPA), and the EPCRA 313 Toxic Release Inventory (TRI) Form R to USEPA, with courtesy copies to the California Environmental Protection Agency (CalEPA) and the Regional Water Quality Control Board. CSP feels that we would benefit from updated knowledge on this subject and requests that these forms be submitted to the Peace Officer Lifeguard staff stationed at Silver Strand State Beach. | The comment cites the Executive Summary (page ES-9) in requesting a more specific discussion of the Offshore Petroleum Discharge System; that discussion is found in Section 2.2.2 and Table 2-1 of the EIS. The comment postulates that "studies that have evaluated levels of hazardous materials in the local environment" exist that have not been incorporated into the FEIS; the Navy believes that relevant studies and local data have been considered in its analysis. The comment requests a testing program, the need for which has not been established in the FEIS. Finally, the commenter requests copies of the Toxic Release Inventory for NAB Coronado, which are available from the CUPA or USEPA.<br><br>While the SSTC FEIS discusses a cumulative increase in the quantity of smoke grenades and flares used in training events, the increase is quantified in terms of individual grenades and flares, and not necessarily the small quantities of potentially hazardous substances. There will be little direct use of smoke grenades and flares directly in or over water. Use per training event in which smoke and flares apply is also small (2-11 items). In addition, this use is spaced out both in time and space throughout the year and at various locations within SSTC, so there are no hot spots of air pollutants on the ranges. |

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| | | | Smoke grenade filler has approximately 11 ounces of a colored smoke mixture (white, red, yellow, green and violet). The smoke is composed of a mixture of potassium chlorate, sodium bicarbonate, lactose, and a dye, all of which have—in the amounts or quantities specified in the EIS—no significant environment effect. In addition, most of the filler is consumed during use. Chemical composition of military flares can be a combination of magnesium, boron, potassium perchlorate, and barium chromate (USAF 1994), or in some cases red phosphorus. Red phosphorus is a common ignition compound used for instance in matches. Red phosphorus is a relatively non-toxicity compound although highly flammable, and subject to environmental degradation in marine systems (Spanggord et al. 1985, EFRB 2010). In an analysis of military flares, the US Air Force found that most of the common flare constituents were consumed during flare ignition. Residual ash from flares contained small quantities of magnesium and boron (USAF 1994). Measured values of magnesium in flare ash [86 part per million (ppm)] were found to be below the natural seawater composition of magnesium (1290 ppm).<br><br>Potassium perchlorate was not a significant residue and was not detected in ash samples measured. In the rare instance that any perchlorate were to remain, perchlorates are also highly soluble, and the ions have a limited tendency to interact with other dissolved chemical species or to adsorb to aquifer materials under typical environmental conditions (Clausen et al 2007). Pechlorate in marine aquatic systems is subject to substantial bacterial degradation (Urbansky 1998, Logan et al. 2001, Brown and Gu 2006, Petrisor 2006, Wilkin et al. 2007).<br><br>Therefore, given the limited, short-term potential for smoke grenade and flare residuals to fall into San Diego Bay and the ocean, the relatively low levels of constituents actually released, and natural environmental degradation of these compounds, the relative risk from use of these items is not |

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| | | | substantial.<br><br>A comparison to related pyrotechnics with substantially more constituents can be made within the San Diego region. For example, the San Diego Regional Water Quality Control Board required water and sediment monitoring by Sea World due to daily firework displays over Mission Bay. On average, Sea World conducts 100-120 shows per year, with each show using up to 250 shells, and up to 1,750 shells for special holidays (SDRWQCB 2007). In support of a the concern for potential environmental contamination from fireworks residue, water and sediment samples were taken from 2001 through 2006 as part of a Coastal Commission permit requirement. Samples were analyzed for various constituents found in fireworks, including oxidizers (ammonium perchlorate and potassium perchlorate), metals (antimony, barium, copper, strontium), and salts (magnesium, sodium, etc.). The final monitoring report concluded that there were no substantial spatial or temporal patterns in concentrations of critical metals in sea water or sediments in the small area of Mission Bay subject to repeated large scale fireworks displays (SDRWQCB 2007)<br><br>Under the No Action Alternative, SSTC training activities require the detonation of small amounts of explosives on the water surface and underwater. While up to 1,610 pounds of explosives are used each year for underwater detonations (Table 3.5-7), the majority of these training events occur on the open ocean side of SSTC.<br><br>As discussed in Section 3.4.2.1.1 through 3.4.2.1.3, high-order combustion of typical military explosives used at SSTC, such as Royal Demolition Explosive (RDX) and pentaerythritol tetranitrate (PETN), consumes over 99.997 percent of the original explosive material. Major detonation by-products consist of common inert gases and relatively inert inorganic salts. For example, exploding 10 pounds of Composition (C)- |

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| | | | 4, which is 91 percent RDX, produces about 3.7 pounds of nitrogen, 25 pounds of carbon dioxide ($CO_2$), 1.6 pounds of water, 1.8 pounds of carbon monoxide, 0.2 pound of ethane, 0.03 pound of hydrogen, 0.02 pound of propane, 0.09 pound of ammonia, and 0.02 pound of methane. The major products of combustion-nitrogen, $CO_2$, and water-are all common natural components of the atmosphere and water. Any explosive residue (<0.003 percent) would be relatively insignificant, and would be either quickly dispersed by local ocean currents (Section 3.5.1.3.4) or buried in ocean sediments. Field studies conducted by the US Army indicate that explosives residue includes 0.003 percent or less of the original quantity of material detonated, although the amounts of explosives residues vary among different types of ordnance. Land-based studies show that, for large ordnance items such as bombs, high-order detonations may spread residual particles in the micron and submicron-sized range over hundreds of square meters. However, individual quantities of explosives used at SSTC are substantially smaller than those tested by the Army, which means smaller amounts of the original detonation materials and less explosive velocity. In addition, SSTC explosive events occur in water rather than on land, and would be subject to substantially less dispersion due to the non-compressibility of water. Given the nature of training events at SSTC, low order detonations, while possible, are not the desired training outcome and any remnants are retrieved to the greatest extent practical to diagnose what may have caused the low-order detonation.<br><br>The environmental fate and effect of military munitions constituents, including RDX, have been the subject of a number of scientific studies to determine if these compounds represent a risk in the marine environment, including water and sediment (Hawari 2000, Belden et al. 2005, Lotufo and Lydy 2005, Houston and Lotufo 2005, Rosen and Lotufo 2005, Juhasz and Naidu 2007, Rosen and Lotufo 2007a, 2007b, Boyd et al. 2008, Monteil-Rivera et al. 2008, Mukhi et |

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| | | | al. 2008, Weber 2008, Lotufo et al. 2009, Lotufo et al. 2010, Rosen and Lotufo 2010, Zhao et al. 2010).<br><br>As a compound in the environment, RDX is subject to natural processes in marine systems that break down (i.e., degrade) the parent molecule to inert nitrogen compounds. Processes include hydrolysis in marine water, photodegradation from light, uptake and metabolism from marine plants, and bacterial degradation in water and sediment (Hawari 2000, Juhasz and Naidu 2007, Boyd et al. 2008, Monteil-Rivera et al. 2008, Lotufo et al. 2009, Weber 2008, Zhao et al. 2010). Based on both laboratory toxicity testing and more realistic environmental exposure scenarios, RDX has also shown low to no toxicity and no potential for bioaccumulation in a variety of marine species, including amphipods, mussels, and fish (Belden et al. 2005, Lotufo and Lydy 2005, Houston and Lotufo 2005, Rosen and Lotufo 2005, Rosen and Lotufo 2007a, 2007b, Mukhi et al. 2008, Lotufo et al. 2009, Lotufo et al. 2010, Rosen and Lotufo 2010).<br><br>Therefore, based on the limited amounts of explosive residues actual deposited during SSTC training events, dispersion and natural degradation of any small amounts of residue, and limited toxicity to marine organisms, the overall effect on the environment of in-water explosives use would be insignificant. |

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| 203. | California State Parks | The Draft EIS does not include an adequate assessment of the potential negative effects of increased activities, especially amphibious and beach activities, on spawning success of the California grunion. This species is largely endemic to Southern California and requires undisturbed natural intertidal sandy beach habitat. The Navy manages a significant portion of this species remaining suitable spawning habitat. Potential negative effects to this species should be quantified, avoided when possible, and mitigated when necessary. | The analysis presented in the EIS indicates that the impacts to the intertidal zone would be minimal, as this is a dynamic energy environment, and any affects in the intertidal zone would be temporary and localized. Considering the limited draft of the vehicles that would be making landings through the intertidal zone, in conjunction with the steep slope of the beach throughout the SSTC-N and SSTC-S, bottom disturbance would be limited and not expected to adversely impact fish habitat. |
| 204. | California State Parks | Given the level of detail for specific training schedules provided in the Draft EIS, it is also difficult to assess the long-term impacts of the proposed increased activities on rare and special-status plant species occurring within the SSTC (*Cordylanthus maritimus* ssp. *maritimus*, *Astragalus tener* var. *titi*, and others listed in Table 3.11-2). CSP shares conservation responsibility with many of these resources and is committed to providing high quality habitat for the successful persistence of these species. CSP feels that the proposed activities in the Draft EIS have the potential to result in significant negative population level effects for these special-status and rare plants. Suggested additional mitigation measures for rare and special-status plants found in the SSTC may include such actions as:<br><br>1. Annual population-level surveys that quantify various impacts from increased training activity;<br>2. Commitment to a regional rare plant conservation program in which unavoidable impacts resulting from increased training activities are mitigated through off-site restoration and enhancement. Contribution toward a special status and rare plant conservation seed-bank should also be explored;<br>3. Further consideration and implementation of on-site special-status and rare plant preserves and protected conservation areas.<br><br>Section 3.11 should address the potential occurrence of Pacific pocket mouse, and the applicability of SSTC South as a viable habitat for long-term conservation of this species. | The *Cordylanthus* does not occur in the Navy action area - it occurs at YMCA Camp Surf and it is managed and monitored jointly by the Navy and the YMCA at that location for its protection. The dune-dwelling *Astragalus tener* var. *titi* has not been seen on the Silver Strand for many years, and is presumed to be extirpated from southern California. Upland rare plants can be locally relatively abundant, and benefit from the Navy's program of annual invasive species control and monitoring. Some benefit occurs through restoration that primarily involves weed control, but sometimes appropriate special status plants are incorporated into restoration efforts. Avoidance and minimization measures are implemented at the Delta beaches for plants identified as rare by California Native Plant Society as List 1B or higher. The Navy conducts annual surveys and treatment for invasive plants, and in recent years has been expanding treatment of iceplant. A vegetation management plan is under development to support least terns and snowy plovers, and this will incidentally benefit rare plant species. Focused rare plant management and annual monitoring includes *Phacelia stellaris, Dudleya variegata,* among other rare plants that are less locally abundant on Silver Strand, or are known to be at risk from disturbance. Finally, |

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| | | Section 3.11 should address coast horned lizard presence and conservation. | the Navy avoids impacts to rare species through its site approval process under NEPA.<br>The Pacific pocket mouse (*Perognathus longimembris pacificus*) was surveyed for at SSTC-S in 2002 using a USFWS trapping protocol (USFWS 2000). The mouse was not detected. Four transects were surveyed on-site within vegetation communities that exhibited suitable sandy soil conditions. Surveyors reported that the species is not expected to occur at SSTC-S due to a lack of suitable habitat (RECON 2004). The Navy will continue to survey for this species during future biological inventories. Due to possible future training requirements, it is the Navy's position that Threatened and Endangered species not be experimentally introduced to unoccupied habitat.<br><br>The coast horned lizard *(Phrynosoma coronatum blainvillii)* was also surveyed for at SSTC-S in 2001-2002 (RECON 2004). It was not detected and the surveyors attributed this to a lack of suitable habitat. They assessed the remnant coastal sage scrub patches to be too small to support a population of this species, and no native harvester ant forage (*Pogonomyrmex* sp.) was found. |
| 205. | California State Parks | Section 3.12 should more accurately address the level to which the SSTC is critically important to the long-term sustainability of healthy migratory and shore bird populations throughout the Pacific flyway. Potential long-term negative effects from the proposed increases identified in the Draft EIS should be more accurately quantified and appropriate mitigation and avoidance measures proposed. | Please see the analysis of impacts to Migratory Birds in Section 3.12. The Navy is committed to work with the Port to fund surveys for waterfowl and shorebirds throughout San Diego Bay every three years. Baywide surveys follow a consistent protocol, and will be used to document future changes in bird abundance, diversity, and use of the Bay. Section 3.12.1.2 of the EIS summarizes over 500,000 observations of San Diego Bay birds by species, location, abundance, diversity, and bird group. The FEIS text will be revised to state that The American Bird Conservancy has designated the South San Diego Bay Unit as a Globally Important Bird Area due to the presence of globally significant numbers of nesting gull-billed terns and continentally significant numbers of surf scoters, Caspian terns, and western snowy plovers. The entire southern end of San Diego Bay, including Sweetwater Marsh and South San Diego Bay Units, has been recognized as a Western Hemisphere Shorebird |

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| | | | Reserve Network Site. |
| 206. | California State Parks | Section 3.13 addresses cultural resources on lands adjacent to CSP properties. CSP reviewers found the history of dredging on the strand inadequate to review mitigating measures, and as a result, questioned conclusions such as:<br><br>As mentioned in 3.13.1.1.2, the training areas in SSTC-North are located on fill deposits that resulted from the dredging of San Diego Bay and the construction of Zuniga Jetty. These fill areas have no potential for in situ heritage resource deposits (3.13-5).<br><br>From experience on adjacent CSP properties, the dredged areas are non-contiguous, and depending upon depths, cover cultural materials that should be addressed both in the SSTC-North and SSTC-South areas. Should the SSTC-South prehistoric sites assumed to be eligible to the National Register have been on CSP land, the 'Summary of Effects' (Table ES-2) conclusion that foot traffic is not an adverse impact would have been questioned. This is especially true to the west of the highway where CSP staff have noted cultural materials in shell middens located undisturbed within centimeters of the surface.<br><br>Regarding submerged cultural sites, underwater shipwrecks and other offshore cultural materials deserve better protection than promised avoidance. As reported in the cultural resource history, Manila galleons have been passing Silver Strand since 1565. The more deeply-submerged prehistoric materials would be difficult to impact with the increased operations described, but some of the submerged historic sites will be impacted by the activities in Alternatives 1 and 2. Assurances that more specific locations and depths will be recorded with the federal clearinghouse (the South Coastal Information Center), and that Navy cultural resource managers will take an active part in designing these avoidances is requested. | The dredge-spoil fill areas described in the EIS as having no potential for in-situ heritage resource deposits are those on the seaward side of SSTC-North. Over time, these deposits have been repeatedly disturbed by amphibious support training activities without any direct or indirect evidence of buried cultural deposits ever observed in the zones used for training. There is a buffer immediately adjacent and parallel to the western side of SR 75 coincidental to the original Silver Strand shoreline that is avoided by training activities and within which are located the recorded archaeological deposits listed in Table 3.13-1.<br><br>The Summary of Effects reference to foot-traffic-only activities not being accountable as an adverse effect applies principally to the terrestrial training area at SSTC-South. This programmatic finding derives from both the dispersed nature of pedestrian-only NSW training activities at SSTC and past consultion determinations of the effect of these kinds of training there and on other NB Coronado ranges, including San Clemente Island. This finding is supported by the prescription that the areas of recorded archaeological sites are restricted to foot traffic only. The finding is also supported by the understanding developed through site evaluations at SSTC-South in 2007 (Underwood 2008), which found that none of the five recorded site areas tested (out of an overall 12 |

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| | | | recorded sites) across the northern portion of SSTC-South possessed sufficient integrity to recommend the NRHP eligibility. For the purposes of this EIS, this no adverse effect precedent is applied in accordance with authorities stipulated under the San Diego Metro Area PA.<br><br>Regarding submerged cultural resources, the primary potential derives from the point-specific Single Anchor Leg Moor (SALM) component of Offshore Petroleum Discharge System (OPDS) training activities. This is a point-specific disturbance described to occur in a zone approximately one mile across all the SSTC-North boat lanes. While late-19th and early-20th-century shipwrecks are documented to have occurred in the vicinity of the SSTC offshore training areas, only the general locations of these resources are known, and none of these appear to fall within the zone of potential effects of SALM/OPDS activities. In the absence of referenced shipwreck locations within this zone, the type comprehensive underwater survey to identify specific locations and depths for submerged resources is deemed unnecessary, and impractical at the several square km scale that would be required. The existing training activity protocol to have divers directly observe the bottom in advance of placement of the SALM to avoid hazards, including shipwrecks, fouling the mooring anchor and associated tackle is considered the better training-activity-specific approach to avoiding inadvertent effects to any observable submerged resources that might be present. |
| 207. | California State Parks | The EIS considers the potential effects on traffic flow and concludes that the capacity of Highway 75 will not be significantly affected. However, CSP is also concerned about the effects that the significant increase in military operations will have as a distraction to motorists on Highway 75. The potential for creating hazardous driving conditions due to military distractions may be exacerbated during peak beach visitation periods. The EIS should analyze this aspect of its proposals potential effects on highway safety and propose appropriate mitigations. | The majority of activities are out of sight of SR-75. Existing and proposed activities will not cause a visual distraction to drivers. The Navy is responsible for motorists on federally controlled land and the California Department of Transportation is responsible for regulation of vehicles on public roadways and lands. While hazardous driving conditions due to military activities are extremely unlikely, drivers' adherence to various speed and traffic control measures are the responsibility of the State, the City of Imperial Beach, and the City of Coronado, and outside of Navy jurisdiction. |

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| 208. | California State Parks | Nearly 1/2 million people visit Silver Strand State Beach each year, most during the spring and summer between April 30 and September 15. The EIS fails to adequately evaluate the effect that increased military operations will have on the visual experience these beach goers have grown accustomed to. Visitors come to Silver Strand to enjoy surf-play, wide sandy beaches and eyelevel views of the ocean, frames by scenic Pt. Loma (to the north) and the Coronado Islands (to the south). The EIS needs to propose means by which the negative visual effects of increased military operations can be minimized, including, but not limited to, considering the seasonality of operations.<br><br>California State Parks appreciates the opportunity to comment on the DEIS and hopes that our comments contribute to a better project. | The Navy has analyzed all potential Land Use and Socioeconomic conflicts within the ROI. The increase in proposed training activities will not result in a change in the public's visual experience because training is currently being conducted in the areas around SSSB. There are no proposed changes in the view shed. The Navy is not infringing on any public lands that are used by the adjacent communities. |
| 209. | California State Lands Commission | Staff of the California State Lands Commission (Commission) has reviewed the above referenced document and offers the following comments on the draft Environmental Impact Statement (DEIS). We understand that this project has not undergone review under the California Environmental Quality Act (CEQA). Depending on what other State or local agencies have discretionary action over the proposed project, the CSLC may take the role of a Lead Agency or a Responsible or Trustee Agency under CEQA.<br><br>As background, the State acquired sovereign ownership of tidelands and submerged lands and beds of navigable waterways upon its admission to the United States in 1850. All tidelands and submerged lands, as well as navigable rivers, sloughs, etc. are impressed with the Common Law Public Trust. The Public Trust is a sovereign public property right, in the nature of an easement, held by the State or its delegated trustee for the benefit of all the people. This right limits the uses of these lands to waterborne commerce, navigation, fisheries, water-related recreation, habitat preservation, open space, or other recognized Public Trust purposes. A lease from the CSLC is required for any portion of a project extending onto state-owned sovereign lands, which are under its exclusive jurisdiction. As to lands involving the Public Trust Easement, the property is subject to certain land use restrictions and public rights and any inconsistent use with the easement may be prevented by the CSLC.<br><br>CSLC has issued a lease to the Navy for a portion of the beach at the Silver Strand, Lease PRC 6319.9, between the Ordinary High Water Mark of 1941 and the Ordinary High Water Mark of 1948. The Pacific Ocean waterward of the Ordinary High Water Mark of 1948 is not covered by a lease from CSLC.<br>Based on a review of the information provided, it has been determined that the Alternative 1 (Preferred Alternative) for the proposed project will be located within state sovereign lands under the leasing jurisdiction of the Commission. The U.S. Navy will need to apply to the Commission for a lease for that portion of the beach which is not currently covered by the existing lease.<br><br>The Commission will need to make a CEQA determination prior to consideration of lease approval. Based on the information provided in the DEIS, a CEQA document will most likely | The Navy, as a federal agency, analyzes the potential environmental impacts of its proposed actions under NEPA. CEQA applies to the discretionary actions of California State public agencies. The actions proposed within this EIS require no new leases of land from the State; and there are no other anticipated State or local agency discretionary actions that would trigger a CEQA review. However, if a real estate action, such as a lease, is determined to be in the best interests of the Navy and the State, the State may be required to conduct a CEQA review of the lease agreement. If the State needs to conduct a CEQA analysis, the Final EIS may be referenced in State CEQA analysis.<br><br>Under the Commerce Clause, Article 1, Section 8 of the U.S. Constitution, the federal government is conferred a "dominant servitude" over navigable waters and the underlying land. Exercise by the federal government of this Constitutional power is not an invasion of any property rights in the water or underlying lands and is not a taking of property within the meaning of the Fifth Amendment. None of the actions proposed below the ordinary high water mark create permanent fixtures or permanent attachments to the underlying land. It is the Navy's position that the federal actions proposed in this EIS create no obligation to enter into real estate leases or agreements with the State owners of lands underlying these navigable waters. |

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| | | need to be prepared for the proposed project in order to cover our discretionary action (lease within state sovereign lands). The CEQA document would need to include all information required under Public Resources Code, section 21000 et seq., including identifying the project's potentially significant impacts and mitigation measures to clearly avoid or mitigate those significant impacts. Public review and all appropriate noticing of the CEQA document (CEQA Guidelines, sections 15072 and 15073), as well as a Mitigation Monitoring Program, will need to be completed. In addition to the information provided in the EIS, the CSLC would need copies of any cultural resource reports completed on land under the jurisdiction of the Commission. Any artifacts found on lands under the jurisdiction of the Commission are considered the property of the state of California. Any disposition of these artifacts requires the approval of the Commission and a transfer of title may be required.<br>The Commission would also like to receive copies of the following documents:<br>• Applicable State regulatory agency permit applications prepared for the project; and<br>• California Coastal Commission Consistency Determination if or when available. | |
| 210. | City of Imperial Beach, California, Office of the City Manager | 1. Due to limited staff and time, our review was not as thorough as we wished. Also given the length of the document and approximately a decade it took to prepare, we request an additional review period of 45 days. | The Navy recognizes the public involvement in the NEPA process. In response to requests by the cities of Imperial Beach and Coronado and citizens, the public and agency comment period for the FEIS was extended to March 30, 2010. |
| 211. | City of Imperial Beach, California, Office of the City Manager | 2. The DEIS does not adequately allow a reader to assess the current and proposed activities within each lane and thus it's difficult to distinguish the impacts in the southern zones from the northern ones, and the changes from current to proposed activities. | Scheduling flexibility and requirements prohibit the Navy from analyzing its training activities in this manner. The Navy has performed an equally proficient method of analysis within the SSTC EIS by analyzing all individual affected resources within the region of influence and not specific areas of training. |

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| 212. | City of Imperial Beach, California, Office of the City Manager | 3. With the increase in aircraft activities and firearm discharges, we request that helicopter sorties and firearm discharges stop no later than 10:00pm and start no sooner than 7:00 a.m. | Realism in training is an essential element of SSTC training. Nighttime operations are an important part of training at SSTCS to ensure personnel are prepared for real world situations. NASNI and NOLF-IB, Imperial Beach have a suite of policies, procedures, and programs to address and promote measures to minimize aircraft noise.<br><br>NOLF-IB is open for flight operations from the last Sunday in October to the first Sunday in April on Monday-Thursday from 0800 to 2230 and on Friday from 0800 to 1800 Pacific Standard Time. NOLF-IB is open from the first Sunday in April to the last Sunday in October on Monday - Thursday from 0800 to 2300 and on Friday from 0800 to 1800 Pacific Daylight Time. The airfield is closed from 1800 local time the day prior to and during all government holidays. Nighttime helicopter transits from NOLF and NASNI, and to and from SSTC-S, occur only over water. The only helicopters overflying residential areas at night are Department of Homeland Security or U.S. Coast Guard. Information on these flight patterns, as well as the percentage of sorties associated with training at SSTC, has been added to Sections 2 and 3.6 (Acoustic Environment) of the SSTC EIS document. |
| 213. | City of Imperial Beach, California, Office of the City Manager | 4. In light of the decrease in beach access due to the increase of training activities, we suggest three mitigation steps:<br>a) The Navy create an alternative pathway running from the general vicinity of the western end of Carnation Street heading in a northeasterly direction along the perimeter of the southern boundary of the base (roughly the northern boundary of 18) to the eastern boundary of the base that parallels SR-75; then proceeding northward on an existing path currently available to the public until the path ceases a bit south of the Cays; then proceeding in a northwesterly direction on Navy property to connect with Silver Strand State Park. This would provide walkers, joggers, runners, bicyclists a north-south pathway/trail to mitigate for the loss of beach access.<br>b) People also walk their dogs along the part of the beach that will be greatly affected by the increased training, and therefore we suggest that the Navy create and maintain a "dog park" somewhere along the southern perimeter of the base somewhere east of Camp Surf. (The Navy had allowed the public to use an area just east of the entry gate on Silver Strand in IB as a dog park. The area is now closed to the public, but it is a possible site to mitigate the impact of the training activities that reduce access to the beach.)<br>c) The Navy should assist in funding beach sand replenishment efforts. For example, the Navy could help the Corps of Engineers with dredging the entry to San Diego Bay and placing the dredge materials (sand) nearshore or on the beach along the coast of Imperial Beach. The City | The Navy analysis within the EIS in Section 3.1; Land Use conclude that no impacts on SSTC-S beaches required mitigation. The Navy will not be including a pedestrian trail as mitigation.<br>The suggested mitigation measure has no real "nexus" with the perceived impact, and the non-significant impact does not require mitigation. |

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| | | prefers that sand be placed onshore because this is the best way to preserve our beaches. Preserving the beach between Carnation Street and the mouth of the Tijuana River would be a measure that mitigates the reduced beach access caused by the increase of naval activities along the Silver Strand north of Carnation. | |
| 214. | City of Imperial Beach, California, Office of the City Manager | 5. In light of the overall increase in noise due to helicopter activities, firearms and other training activities, mitigation activities should include:<br>a) Strict adherence to flight patterns at Ream Field that will not allow fixed-wing and helicopter flights over homes in Imperial Beach.<br>b) There should be no helicopter training at Ream Field after 9:30pm. All flights should be heading back to their home base after 9:30pm.<br>c) Work with the City In developing a more effective notification system of planned training activities that have the potential to impact residents of Imperial Beach (in addition to the standard notification provided to our Public Safety Department when exercises involve pyrotechnics or firearm discharges). | Navy operations at NOLF are outside of the scope of the Proposed Action, but are addressed under Cumulative Impacts. Airfield restrictions for NOLF and NASNI are discussed above in comment response #212. The Proposed Action addressed in this EIS does not involve helicopter activity at NOLF, so impacts of those activities cannot be mitigated in this EIS.<br>As listed in NBCINST 3502-1, the Navy does notify local public safety agencies and city governments about specific upcoming hazardous or high-visibility night training events so that the local governments may disseminate the information to their communities. Because of this and similar comments, the Navy is evaluating the possibility of extending advanced notification to the neighborhoods of Imperial Beach and Coronado through contact with City offices or the Naval Base Coronado website. |
| 215. | City of Imperial Beach, California, Office of the City Manager | 6. Table 3.6-9 indicates that Camp Surf is situated further away from the noise source than the residential areas of Imperial Beach when the other tables show Camp Surf closer to the noise source than the Imperial Beach residential areas. Please explain. | The reason the distances vary is because the locations of the sources change from table to table. |
| 216. | City of Imperial Beach, California, Office of the City Manager | The City of Imperial Beach appreciates the additional time the Navy has afforded the public to review and comment on the environmental document that assesses the potential impacts of the Navy's proposal to provide increased operationally and realistic training for naval personnel at the Silver Strand Training Complex (SSTC). The City offers the following additional comments on the environmental document:<br><br>1. The City of Imperial Beach concurs with the comment by the City of Coronado that the DEIS does not adequately address the increased environmental impacts to surrounding properties that would result with the proposed activities. While the DEIS acknowledges that the preferred plan will result in increased impacts, additional or more effective mitigation measures are not proposed to reduce the impacts preferably to a level of insignificance. The lack of mitigation measures despite the major increase in activities and impacts seems, at best, illogical. Mitigation measures are necessary to reduce the significant impacts resulting from the increase in quantity and types of activities proposed. | The City of Coronado's letter has been received and the component concerns have been addressed, and the EIS has been modified where applicable. The Navy appreciates the comments from both City Councils. The Navy recognizes its proximity to adjacent communities, and has attempted to structure its training activities to achieve operational readiness and realistic training while minimizing potential impacts to the surrounding area. |

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| 217. | City of Imperial Beach, California, Office of the City Manager | 2. The City also wishes to modify our previous comment of our letter of March 5, 2010 wherein the City proposed a pedestrian and bicycle path from Carnation Avenue to Silver Strand State Park. We would like to refer to this path as a "Proposed Coastal Mitigation Trail" due to the potential loss and/or adverse impacts to the existing and long-utilized beach access along the shoreline adjacent to the Navy Radio Receiving Facility (NRRF). | Your comment has been noted, and the Navy is committed to a continued dialogue on the Coastal Trail. |
| 218. | City of Imperial Beach, California, Office of the City Manager | 3. We request that the Draft EIR carefully analyze the impacts the increased activities will have on traffic on SR 75 and Palm Avenue to Interstate 5. | The SSTC EIS has analyzed traffic impacts from the proposed increase in training activities at SSTC. There would be no increase in personnel stationed at SSTC as a result of the implementation of the Proposed Action. Currently, intersections and roadways within the ROI typically experience an acceptable LOS. Although the intersections at Gates 1 and 2 experience unacceptable LOS, traffic related to the Proposed Action represents less than one percent of the morning volume and less than two percent of the evening traffic at these intersections. |
| 219. | City of Coronado, Office of the City Council – Carrie A. Downey | The citizens of Coronado appreciate and support the training of our military forces to insure their safety and efficacy when they are sent to perform their duty in hazardous conflicts around the world. However there needs to be a balance between developing realistic training scenarios on bases and ranges that are in the midst of highly developed residential areas. I provide the following additional recommendations for traffic, noise, and public safety mitigation. These actions would increase the cooperation between Coronado residents and the Department of the Navy (DON) for status quo operations, as well as for Alternative A increased tempo operations.<br><br>1. Mitigation Measure 3.16.2.4.1 Exercise Planning. The DEIS lists the blanket statement "The Navy considers public safety in planning its exercises. Factors considered in evaluating the impact of the training on public safety include proximity of the activity to public areas; access control; schedule (time of day, day of week); public notification...."<br><br>Considering isn't the same thing as doing. DON should notify the Coronado City Manager and CUSD Superintendent of ANY change in daily operations greater that 1% over the status quo. This is different than 1% over baseline in the DEIS. As the document point out the navy is attempting to get the historical activities NEPA compliant not what is currently taking place. "The U.S. military commenced operations in Afghanistan and Iraq as part of the Global War on Terror; the deployment of units overseas caused many range complexes, including SSTC, to experience temporary decreases in usage....Thus to include additional: A). personnel movements, B) equipment or supply deliveries, C) vehicle (including boats, cars, tanks helicopter drop offs, etc.) that could increase traffic or noise levels, and/or security procedures at the base gates. In the past all of these activities have caused significant traffic delays among Coronado residents without explanation. | The Navy recognizes its proximity to adjacent communities, and has attempted to structure its training activities to achieve operational readiness while minimizing potential impacts to the surrounding area. As listed in NBCINST 3502-1, the Navy does notify local public safety agencies and city governments about specific upcoming hazardous or high-visibility night training events so that the local governments may disseminate the information to their communities. Because of this and similar comments, the Navy is evaluating the possibility of extending advanced notification to the neighborhoods of Imperial Beach and Coronado through contact with City offices or the Naval Base Coronado website.<br><br>Regarding the increase in transportation at SSTC, an increase in SSTC training activities does not have the same traffic impacts as the homeporting of multiple aircraft carriers has had on the Coronado area. There would be no increase in personnel stationed at SSTC as a result of the implementation of the Proposed Action. The Proposed Action does include an increase in activities performed by existing personnel. The SSTC EIS adequately addresses impacts to traffic from |

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| | | Currently the Department of the Navy notifies Coronado in advance of the deployment and return date of the aircraft carriers home ported in Coronado. This allows Coronado to make operational changes in the public safety and public works departments to have the appropriate city staff on hand to try to move civilian traffic should the need arise. Likewise the City Public Works Department makes sure Coronado does not schedule sewer repair work, or CALTRANS does not schedule road repair work on days where the military bases on Coronado will be experiencing increased traffic going to and from the bases. This system has worked well for large events such as movement of aircraft carriers but it would work equally well for events that do not rise to the level of a ship's movement but would increase traffic and noise in the surrounding community such as using the beaches and or base facilities as part of a Fleet exercise or other larger training evolution.<br><br>Should the Navy need to use all 14 of the beach lanes in the Silver Strand Training Complex (SSTC) at both ends of Coronado, this would undoubtedly raise the noise levels and ' traffic along the Silver Strand Highway past the Coronado Cays residential development and the Silver Strand Elementary School. Both contain sensitive noise receptors, as acknowledged on page 3.6.1.4.1. The advance notification to the CUSD Superintendent would allow the option to move planned outside activities at the Silver Strand School inside or reschedule them to avoid the additional noise and or distraction it would provide the students. It would allow notification to the parents living in the Cays to expect increased traffic on the strand during school drop off time in the morning to insure school start time is not delayed. | increased training activities. The ADT of Coronado roads is discussed in Table 3.14-2. The EIS analyzed the Level of Service (LOS) of local roads to determine the contribution of military activities to overall traffic on public roads. Based on the analysis, increases in military training vehicle trips per day would represent less than two percent of the total daily traffic, and local roads would experience an acceptable LOS, with the exception of intersections at Gates 1 and 2; which would experience an unacceptable LOS. However, traffic generated under Alternatives 1 and 2 would represent less than one percent of the morning traffic volume and less than two percent of the evening traffic volume at these intersections, and this increased LOS would be well within the capacities of the existing regional roadway network. |
| 220. | City of Coronado, Office of the City Council – Carrie A. Downey | 2. Silver Strand Elementary School. Although the DEIS identify Navy Housing areas on Naval Base Coronado within the SSTC, and the location of the Silver Strand Elementary School, Table 3.6-4 Acoustic measurements during Fleetex 2002 does not provide measurements for the Silver Strand School. Please provide those measurements or an explanation that they area was not measured or is too far to receive noise from Fleetex if that is appropriate.<br><br>Noise and traffic are not the only concerns for students and parents at the Silver Strand School. The lease agreement between to CUSD and the Department of the Navy is an example of how the military and community can work together to best serve the needs of military families and the community. The majority of the students educated at the Silver Strand Elementary School are dependants of active duty military service members, however there is a significant portion that reside in the Coronado Cays housing development that may not have exposure to military training or military weapons. The DEIS does not explain in depth what types and frequency of training will be visible to the students attending Silver Strand Elementary School.<br><br>Under Alternative 1, the DEIS states in Section 3.16.3.3 that "SSTC land training activities would not employ live ammunition, with the exception of shotgun shells for breacher training and small arms for training inside bunkers on SSTC-S.....Flares, smoke grenades, and other small pyrotechnics unused in training do not release projectiles or scatter fragments, and thus have no potential for effects in the absence of direct contact." | The Navy recognizes its proximity to adjacent communities, and has attempted to structure its training activities to achieve operational readiness and realistic training while minimizing potential impacts to the surrounding area. In this manner, the Navy is adding mitigation measures for alerting the adjacent communities about events which may be considered intrusive as well as posting signage and controls regarding public access to the beaches.<br><br>Impacts to Military Family Housing on Silver Strand, including the Silver Strand Elementary School, have been specifically discussed in 3.6.2.2.6 and 3.6.2.3.7 of the EIS. Measurements were not made at Navy housing areas or Silver Strand Elementary School because the primary noise concern was for residents closest to SSTC-S sound sources. However, sound from SSTC-N training would have the greatest effect on the Military Family Housing across from Boat Lanes 7-10 and on Silver Strand Elementary School. ELCAS training on |

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| | | While some students would enjoy glimpses or military training, others may become frightened by the sight of Navy SEALs coming ashore with weapons. The exact nature of the visuals students and staff at the school could be exposed to should be clarified. Additionally, if there will be no live weapons of any kind used within sight of the school that needs to be clarified. The teachers and staff should be aware in advance of what might distract their students during lessons and plan accordingly. Advance notice to the CUSD Superintendant would be appropriate mitigation. | Bravo Beach may produce sound levels at the Military Family Housing of up to 81 dBA, 15-minute Leq during pile driving, which would occur periodically during the day and night. Intermittent pile-driving would have a greater effect on the houses that are closest to Bravo Beach during training at Bravo Beach, and on the houses closest to the Highway for training on the oceanside beach lanes. Sound from blanks and simunitions used during Hell Week could produce noise at Military Family Housing and the Elementary School, which would be above the typical daytime urban background sound level. Training exercises early in the morning would have a greater effect on residents than those occurring later in the day because the background sound level is lower at that time.<br><br>The acoustic analysis presented in the FEIS describes the real-time effects of the various types of training sound on exposed individuals, such as speech interference and sleep disturbance, that can result in annoyance and stress. The FEIS acknowledges that such effects would occur occasionally, but concludes that the incremental effects of sound from the proposed training activities at SSTC would not have a substantial effect on the acoustic environment. As listed in NBCINST 3502-1 (dated 26 Mar 2008), the Navy does notify local public safety agencies and city governments about specific upcoming hazardous or high-visibility night training events so that the local governments may disseminate the information to their communities.<br><br>Training activities presented in this EIS are typically not within the line of sight of CA-79, and are not expected to have an impact on the view from the Scenic Highway or from neighboring communities. Regarding the impacts on children at SSTC, no live weapons are used at SSTC. Simunition weapon activities used by Navy personnel are conducted at SSTC-S, and out of view of local schools and communities as well. |
| 221. | City of Coronado, Office of the City Manager – James F. | The City of Coronado has reviewed the above document and concluded that further information and analyses are required to determine the cumulative environmental impacts associated with the planned activities for the Silver Strand Training Complex (SSTC). Of particular concern are | The individual effects analyses of military activities (short-term and long-term) are presented in their individual sections, where the potential impacts are discussed in detail. The |

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| | Benson | the statements contained throughout the document that the military facilities and/or operations are not expanding; rather, just the frequency; therefore, no environmental mitigation is required. | determinations on the cumulative impacts of military activities are presented in Section 4 of the FEIS. The discussion in the cumulative impacts section is intended to present the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions, regardless of what agency (federal or non-federal) or person undertakes such other actions. The applicable impact analyses from the Environmental Consequences sections have been carried forward into the cumulative impacts discussion.<br>As discussed in each resource section and summarized in Chapter 5 of the EIS, the Navy has analyzed the increases in frequencies of training events and has developed mitigation and protective measures to minimize potential impacts of the Proposed Action. |
| 222. | City of Coronado, Office of the City Manager – James F. Benson | The draft EIS contains several areas where it acknowledges new operations and new activities will be occurring at SSTC. If more military operations and activities will be occurring at SSTC, then more personnel will be arriving in Coronado, and more vehicles will be commuting to and through Coronado impacting local streets. Not only will the additional traffic lead to impacts to intersections currently at unacceptable Levels of Service, but the overall preferred plan of continued plus new activities and operations will lead to significant cumulative impacts on traffic, noise, greenhouse gas emissions, and the public's access to utilize the waters of the State, which, when considered together, should be mitigated. | Regarding personnel-pedestrian and vehicle increases in traffic, there would be no increase in personnel stationed at SSTC from the implementation of the Proposed Action. The Proposed Action does include an increase in activities performed by existing personnel.<br><br>The activities associated with the Proposed Action would be increased, but would not increase the signal phase times at NAB intersections. There would be no increase in greenhouse gases from personnel transit because personnel tempo will remain the same, as indicated above. A further discussion of greenhouse gas emissions is presented in Chapter 4. |
| 223. | City of Coronado, Office of the City Manager – James F. Benson | Please revise the draft EIS to address the questions and concerns described on the attachment.<br><br>Of note is that the draft EIS does not appear to adequately address the expanded activities of the Preferred Alternative and associated traffic, noise, and coastal access impacts to surrounding properties within SSTC corridor, both individually and cumulatively. The draft EIS acknowledges increased noise impacts, durations, and sound levels; however, no mitigation is proposed based upon the assumption that activities currently exist and there will be an expansion over a broader area that will minimize noise impacts. The draft EIS needs to be revised to properly address, analyze, and quantify the items detailed in the list attached to this letter. | The training activities associated with the SSTC have been directly analyzed in the respective resource sections of the EIS. The expanded activities discussed in the EIS have been analyzed in the respective sections of Chapter 3 and the additional training activities that are not associated with SSTC have been analyzed in the cumulative section of the EIS.<br>The Navy has developed mitigation plans for activities that may cause an impact to the environment, and has presented these in the EIS. The Navy has analyzed the activities associated with SSTC, with both the public and the environment in mind, to achieve operational readiness while minimizing impacts to the surrounding area. Based on this analysis, mitigation has been added to Navy procedure where the potential for an adverse effect has been found; these measures are described in full in Section 5 of the FEIS. |

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| 224. | City of Coronado, Office of the City Manager – James F. Benson | Lastly, it was pointed out to the Coronado City Council at their meeting of March 2, 2010, that the citizens of Coronado have not had adequate time to review this document. Given the fact that the plan has been understudy since 2001, it would seem appropriate to provide the public with more than 45 days to review such a voluminous document. The City requests an extended public review and comment period for the EIS.<br>Thank you in advance for reviewing and responding to our questions and requests for further information so the City can adequately determine the scope of anticipated environmental impacts to the Silver Strand corridor associated with the Navy's Silver Strand Training Complex. The City also appreciates your serious consideration of an extended period of time to review the document to allow for full public participation and review of this important study. | The Navy has conducted numerous outreach events and briefs to local governments and special interest groups. In response to requests by the cities of Imperial Beach and Coronado and citizens, the public and agency comment period for the FEIS was extended to March 30th. |
| 225. | City of Coronado, Office of the City Manager – James F. Benson | 1. The draft EIS acknowledges there will be new squadrons, flight patterns and helicopter training occurring at SSTC. The draft EIS fails to identify the location points where the helicopters will take off and the paths of travel to and from the training areas and any increased public safety risks to residents, school populations, and beach users due to the increased amount of flight activity as well as the increased frequency and noise associated with the increased frequency of activity. The draft EIS should address, quantify, and analyze these issues. | Potential public safety risks are discussed in Section 3.16.2.1 of the FEIS and potential acoustic impacts from aircraft activities are discussed in Section 3.6.2.2 and 3.6.2.3 of the FEIS.<br><br>The typical flight pattern in support of SSTC-S inland training consists of an approach along the San Diego Bay flight corridor, turning west on the southern side on Emory Cove, and beginning a descent into SSTC-S, targeting the drop zone to the west of Bunker 99 on the northern end of SSTC-S. Once established in this approach, the helicopters remain at 500 feet over residential neighborhoods and do not reduce their elevation to 150 feet until they are over SSTC-S. On departure, the helicopters ascend to the west over the Pacific Ocean.<br><br>As described in Section 3.6.1.5 of the FEIS (Affected Environment), a substantial amount of daytime and nighttime helicopter activity occurs in the vicinity of SSTC that is not associated with SSTC training activities. Nighttime helicopter transits from NOLF and NASNI, and to and from SSTC-S, occur only over water. The only helicopters overflying residential areas at night are Department of Homeland Security or U.S. Coast Guard. Information on these flight patterns, as well as the percentage of sorties associated with training at SSTC, has been added to Sections 2 and 3.6 (Acoustic Environment) of the SSTC EIS document, and beginning a descent into SSTC-S Department of Homeland Security or U.S. Coast Guard |

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| 226. | City of Coronado, Office of the City Manager – James F. Benson | 2. Section 3.1-12 notes that 80% of flight occurs over the water and aircraft are required to approach and depart from training activities over the water. Is there a map that shows this flight pattern? What is the flight pattern for the remaining 20% including both approach and departure locations? The draft EIS should address, quantify, and analyze these issues. | A map presenting flight routes will not be added to the FEIS; however, Chapter 9, paragraph C (Noise Abatement) of NBC Instruction 3710.7U (Air Operations), dated September 10, 2008 states that: (a) pilots shall ensure altitude minima as prescribed in the OPNAVINST 3710.7 series and course rules, (b) flights directly over the city should be avoided, and (c) H-53 model aircraft are prohibited from using NOLF-IB.<br><br>Helicopter overflight patterns are described in Section 3.6 for use in the acoustic analysis. Navy activities at NOLF IB are outside the scope of the Proposed Action, but are addressed under Cumulative Impacts. Airfield restrictions for NOLF and NASNI are discussed above in comment response #212. The Proposed Action addressed in this EIS does not involve helicopter activity at NOLF, so impacts of those activities cannot be mitigated in this EIS. |
| 227. | City of Coronado, Office of the City Manager – James F. Benson | 3. Section 3.1.2.3.1 notes a new activity, N8 Tactical Recovery of Aircraft and Personnel, would involve landing or hovering of helicopters at SSTC-S at nighttime. Where exactly within the southern area of the training complex would this activity occur? How many aircraft, how frequent and for what duration would this occur? | As discussed in Chapter 2, Table 2-2, all TRAP activities will occur on SSTC-S beaches and within the SSTC-S fence line. The Navy proposes four TRAP activities under Alternatives 1 and 2, which involve up to four helicopters (Appendix C). The helicopter landing zone is located near Bunker 99 in the northern portion of SSTC-S. No helicopters will hover over the beach. |
| 228. | City of Coronado, Office of the City Manager – James F. Benson | 4. Section 3.6-26 discusses Acoustic Impacts associated with the Preferred Alternative. The draft EIS notes sound levels will remain the same but training events producing sound would increase in frequency. No mitigation is proposed. The draft EIS needs to analyze the noise impacts of the increased number of training events both individually and cumulatively. | With regard to helicopter sound, the analysis in Section 3.6 indicates that, while the number of helicopter sorties would increase substantially under Alternatives 1 and 2, the increased frequency of short-term sound exposures from increased helicopter pass-bys would not be sufficient to noticeably change the hourly average sound level at any one off-installation location. Because of the logarithmic nature of sound; a doubling of sound energy results in only a three-decibel increase, which under typical conditions is barely discernable. The analysis of helicopter sound is based upon broadly defined flight paths, consistent with a normal degree of variability introduced by pilot discretion, weather, time of day, and safety concerns such as other aircraft.<br>Helicopter activity discussion has been added to Cumulative; Section 4.3.6. The Section discusses the various squadrons based out of NASNI and the number of helicopter flights that these squadrons generate. The Navy AICUZ study is being |

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| | | | updated to identify all flights generated from NASNI and NOLF.<br><br>The acoustic analysis presented in the FEIS describes the real-time effects of the various types of training sound on exposed individuals, such as speech interference and sleep disturbance, that can result in annoyance and stress. The FEIS acknowledges that such effects would occur occasionally, but concludes that the incremental effects of sound from the proposed training activities at SSTC would not have a substantial effect on the acoustic environment. Therefore, other than existing administrative controls on the placement of activities discussed in Section 3.6.1.6, no sound-related mitigation measures were proposed. |
| 229. | City of Coronado, Office of the City Manager – James F. Benson | 5. a. Section 3.6.2.3.2 notes existing aircraft noise is increasing from 778 helicopter sorties per year to 2,220 per year representing a 185% increase. What is the duration and frequency of the sorties? The Amphibious Raid activity is noted to represent the most intense aircraft sound event at SSTC and the frequency of the events would increase to 18 per year. What is the duration of these events? It is not clear from the tables and maps where these activities would be located.<br><br>b. An additional activity noted as Tactical Recovery of Aircraft and Personnel (TRAP) notes 5 helicopters could be employed and the activity would occur at night, lasting one to two hours. It does not appear to be identified in Table 2-2 and it is not clear where this activity would occur.<br><br>c. Cumulatively, the analyses conclude the types of activities described have occurred over time and the only difference is the frequency and no mitigation is required. If the number of activities, duration of activities, and type of activities increases, the amount of noise will unquestionably increase representing significant changes in noise levels to the area and should be mitigated. | a. As proposed under Alternatives 1 and 2, up to 1,643 helicopters could be involved with SSTC training events. Approximately 150-200 helicopters per year would fly into SSTC-S inland under Alternatives 1 and 2. While the Amphibious Raid activity as a whole may take up to three days to complete, the use of helicopters may only be approximately four hours (Appendix C).<br><br>The remaining 1,450 to 1,500 helicopter operations would occur offshore in the boat lanes or bay training areas. The most substantial increase in helicopter operations from baseline to Alternatives 1 and 2 would occur with the 386 new MH-60 mine hunting operations, in the western portions of boat lanes. The NBC PAO can be contacted for noise complaints and operational suggestions.<br><br>b. TRAP is identified in Table 2-2, and states that; "TRAP consists of the insertion of up to 75 personnel ashore via four to six helicopters hovering and/or landing at a designated inland drop zone in northern part of SSTC-S."<br><br>c. The individual effects analyses of military activities (short-term and long-term) are presented in their individual sections, where the potential impacts are discussed in detail. The determinations of the impacts of military activities are also presented there. The discussion in the cumulative impacts section is intended to present the impact on the environment which results from the incremental impact of the action when |

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| | | | added to other past, present, and reasonably foreseeable future actions, regardless of what agency (federal or non-federal) or person undertakes such other actions. The applicable impact analyses from the Environmental Consequence sections have been carried forward into the cumulative impacts discussion. |
| 230. | City of Coronado, Office of the City Manager – James F. Benson | 6. How do the planned flight paths for new helicopters (to and from SSTC) align with the current Airport Land Use Study for the military bases? How will these planned/proposed paths affect a study that is currently underway for the NAB and those existing uses within the project boundary? | The planned flight paths under the Proposed Action remain unchanged from existing flight corridors, and are in line with the current Airport Land Use Study. The current AICUZ study will not be impacted because there are no changes to the flight paths. |
| 231. | City of Coronado, Office of the City Manager – James F. Benson | 7. The draft EIS does not identify the flight path and accident potential zones (APZs) areas for the helicopters and aircraft in transit to SSTC. The document references NAVFAC P-80.3 indicating APZ is not required. Provide documentation from the referenced document justify/explaining why none is required. | The typical flight pattern in support of SSTC-S inland training consists of an approach along the San Diego Bay flight corridor, turning west on the southern side on Emory Cove, and beginning a descent into SSTC-S, targeting the drop zone to the west of Bunker 99 on the northern end of SSTC-S. Once established in this approach, the helicopters remain at 500 feet over residential neighborhoods and do not reduce their elevation to 150 feet until they are over SSTC-S. On departure, the helicopters ascend to the west over the Pacific Ocean. As listed in P80.3, APZs are developed for runways and landing pads rather than for transit routes.<br><br>As described in Section 3.6.1 of the FEIS (Affected Environment), a substantial amount of daytime and nighttime helicopter activity occurs in the vicinity of SSTC that is not associated with SSTC training activities. Helicopter transits from NOLF and NASNI, as well as to and from SSTC-S, occur only over water at nighttime. The only helicopters overflying residential areas at night are Department of Homeland Security or U.S. Coast Guard. Information on these flight patterns as well as the percentage of sorties associated with training at SSTC has been added to the SSTC EIS document in Sections 2 and 3.6 (Acoustic Environment).and beginning a descent into SSTC-S Department of Homeland Security or U.S. Coast Guard |
| 232. | City of Coronado, Office of the City Manager – James F. Benson | 8. The Acoustic Environmental analysis notes there will be an increase in the frequency of aircraft; increase in amphibious vehicle training; increase with ELCAs and associated pile driving; increase in Breacher activities and use of shotgun blasts. The draft EIS notes while all of these activities will be generating increased noise levels, only the frequency of activity will be increasing; therefore, no mitigation is proposed. Mitigation is identified as the Navy's ongoing process and procedures to notify adjoining agencies/facilities when disturbances will occur. Public notification that noise impacts will occur does not mitigate the noise impacts experienced | Hearing loss may occur where individuals are exposed to a sustained noise level of 85 dB or above The training activities at SSTC do not result in sustained sound levels of this intensity in off-installation areas. Therefore, tinnitus and hearing loss would not occur as a result of SSTC training activities. |

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| | | by students and school officials, residents and tourists. | The activities will increase with implementation of the Proposed Action and the Navy acknowledges that a substantial increase in the frequency of impulsive noise events is likely to result in some increase in such reactions in the community. The acoustic analysis presented in the FEIS describes the real-time effects of the various types of training sound on exposed individuals, such as speech interference and sleep disturbance that can result in annoyance and stress. The FEIS acknowledges that such effects would occur occasionally, but concludes that the incremental effects of sound from the proposed training activities at SSTC would not have a substantial effect on the acoustic environment. Therefore, other than existing administrative controls on the placement of activities discussed in Section 3.6.1.6, no sound-related mitigation measures were proposed. |
| 233. | City of Coronado, Office of the City Manager – James F. Benson | 9. Section 2.3, page 2-27 discusses Alternative 1 as the Navy's Preferred Alternative and is "designed to meet Navy and Department of Defense (DOD) current and near-term operational training requirements." How is "near-term" operational training requirements defined? Is there an estimate for how long these expanded activities, increased training tempos and operations will meet the 100% training needs as identified in the draft EIS? Is this for a period of 5 years, 10 years or longer? If some of the "new" activities and training operations need to be expanded in the future to meet Navy mission requirements, will a supplemental Environmental Assessment be completed? | Near-term operational requirements are defined as baseline training tempo that was established by taking into consideration the historical usage data at SSTC, specifically, from 2001 through 2007. It's important to note that during this period, the U.S. military commenced operations in Afghanistan and Iraq as part of the Global War on Terror. Many of the units that would normally be training at SSTC were deployed overseas. Additionally, the focus of the individual and unit training temporarily shifted to inland (desert or mountainous) environments to prepare personnel for conditions they would encounter in combat operations overseas. As such, SSTC has experienced temporary decrease in training usage and tempo during the period being evaluated (2001 through 2007). To establish baseline training tempos, the Navy evaluated available 2001 through 2007 training data, considering year-to-year fluctuations as well as the recent progressive decline in training tempo at SSTC. For each training activity, the Navy selected 2001- 2007 data that were most reflective of the average historical training conditions over the past few decades.<br>Implementation of the Proposed Action would occur over a five year period. Training activities will be evaluated in five years (2015) for the accuracy of meeting 100 percent of the training requirements as analyzed in the EIS. If new mission requirements are necessary to support training needs, supplemental NEPA documentation may be required. |

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| 234. | City of Coronado, Office of the City Manager – James F. Benson | 10. The Purpose and Need section discusses "increased training tempo" from current baseline conditions. This needs to be better defined to be properly analyzed. For example, the baseline tempo of 3,926 activities indicates it is not associated with personnel. The Preferred Alternative indicates an increase in activities approximately 41% to 5,543 activities but there are no associated man hours to correspond to these activities. The draft EIS should be revised to address/clarify increased training tempo of approximately 41% without increased personnel. | There is no increase in personnel stationed at SSTC as a result in the implementation of the Proposed Action. The Proposed Action does include an increase in activities performed by existing personnel. This clarification has been added to Section 2 of the FEIS |
| 235. | City of Coronado, Office of the City Manager – James F. Benson | 11. Section ES 1.3.1 documents the increase of Naval Special Warfare personnel operating on NAB Coronado, equivalent to one additional Sea, Air and Land team. It also documents the realignment of the Explosive Ordnance Disposal groups, which has necessitated expanded use of the Southwest Region training venue, including SSTC. The Marine Corps will also increase the number of personnel cycling through training programs at SSTC. Finally, it discusses new platform, training equipment, and service life extension programs to keep up with current needs. All of the needs correspond to additional personnel training at SSTC but they are not quantified nor are their impacts on the community accounted for in the draft EIS. In particular, what are the impacts to daily traffic as these new personnel travel to and from NBC to participate in this training? | Personnel participating in activities under the Proposed Action have been accounted for within Chapter 2.<br>The SSTC EIS has analyzed traffic impacts as a result of the increase in activities at SSTC. There is no increase in personnel stationed at SSTC as a result in the implementation of the Proposed Action. Overall, there is an increase in military vehicle traffic and traffic related to the Proposed Action represents less than 1 percent increase of the morning volume and less than 2 percent increase of the evening traffic at these intersections. |
| 236. | City of Coronado, Office of the City Manager – James F. Benson | 12. The Traffic and Circulation section notes there will be an increase in trips resulting from increased activities and operations; however, it will be less than 2% of the total daily traffic generated. The draft EIS acknowledges Gates 1 & 2 currently experience unacceptable Level of Service. The draft EIS notes that since the increased activity will amount to 2% of traffic, no mitigation is proposed. Any further decrease to the level of service to these intersections should be analyzed and addressed. | The SSTC EIS has analyzed traffic impacts as a result of the increase in activities at SSTC. There is no increase in personnel stationed at SSTC as a result in the implementation of the Proposed Action. Currently, intersections and roadways within the ROI typically experience an acceptable LOS. Although the intersections at Gates 1 and 2 experience unacceptable LOS, traffic related to the Proposed Action represents less than 1 percent of the morning volume and less than 2 percent of the evening traffic at these intersections. |
| 237. | City of Coronado, Office of the City Manager – James F. Benson | 13. Section 4.3.14, Page 4-22 Transportation and Circulation cumulative analysis does not adequately analyze the impacts associated with the "increased tempo" of activities proposed with SSTC Preferred Alternative. Where are the estimated traffic generation rates to arrive at the conclusion of a less than 2% increase in traffic? How can an argument be made that since the number of employed are not increasing, therefore, there will be no increase in traffic? What about the new and expanded activities and training planned for SSTC? Where are these "employees" coming from when some of the activities are "new" to SSTC? The document should analyze all the trips associated with the increased training activities including commuter access to/from SSTC/NBC. | The Proposed Action does not include an increase in personnel stationed at SSTC; therefore, traffic generation rates were not calculated on increased personal vehicle trips into the region of influence. However, traffic generation was estimated based on the additional military vehicles needed to support the proposed increase in training and the time of day the increased military vehicle use would occur. Based on these estimates, the increase in military vehicle traffic and traffic related to the Proposed Action represented less than 1 percent increase of the morning volume and less than 2 percent increase of the evening traffic at these intersections. Based on the analysis, increases in activities did not have a substantial impact on the existing LOS because new and expanded activities would not occur at times when intersections are at their busiest; in the morning and afternoon peak hours. In addition, activities |

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| | | | contributing to peak hour traffic are already accounted for in the baseline. Any new activities would not be scheduled at the peak hours but at other times of the day when the LOS is acceptable. |
| 238. | City of Coronado, Office of the City Manager – James F. Benson | 14. Table 2.1, Baseline and Proposed Tempos for SSTC Training Activities, identifies 78 training activities along with duration and number of events per year. The document should relate the activities to number of personnel. How many people are training under the baseline and how many will be training under the proposed activities? | As stated above, existing personnel tempo will not change as a result of implementation of the Proposed Action. This information is presented in detail in Appendix C and this appendix is now referenced in Section 2 of the FEIS. |
| 239. | City of Coronado, Office of the City Manager – James F. Benson | 15. Table 2-2, Proposed New Training Activities at SSTC for Alternatives 1 and 2, identifies 11 new activities. The document should relate the new activities to the number of personnel. How many additional people will be trained under the new activities compared to the baseline? | As stated above, there is no increase in personnel stationed at SSTC as a result in the implementation of the Proposed Action; the tempo of training will increase with the Proposed Action. Appendix C of the FEIS presents a detailed account of all components of training activities associated with the Proposed Action. |
| 240. | City of Coronado, Office of the City Manager – James F. Benson | 16. The draft EIS notes baseline activities will increase from 3,926 activities to 5,343. Many of the new activities are a result of new helicopter training activities such as 200 new mine hunting; 48 new helicopter mine detection; 100 helicopter activity; 48 MH-60s helicopters; 124-154 helicopter rope training; and 109 to 198 Close Quarter Combat with helicopter use. Amphibious Raise (with possible helicopter use) will expand from 6 days a year to 54 activities a year. Perhaps even more significantly, CRRC OTB Insertions and Pyrotechnics will increase from 4 day events approximately 52 times a year to 86 times a year. This change results in almost 365 days per year this activity will occur. The draft EIS does not analyze the cumulative impact of the entire new helicopter activities will have on the air when cumulatively combined. The draft EIS does not contain a section where analysis of combined activities along SSTC can be visualized and analyzed in terms of cumulative activities and noise. | As described in Section 3.6.1 of the FEIS (Affected Environment), a substantial amount of daytime and nighttime helicopter activity occurs in the vicinity of SSTC that is not associated with SSTC training activities. Helicopter transits from NOLF and NASNI, as well as to and from SSTC-S, occur only over water at nighttime. The only helicopters overflying residential areas at night are Department of Homeland Security or U.S. Coast Guard. Information on these flight patterns as well as the percentage of sorties associated with training at SSTC has been added to the SSTC EIS document in Sections 2 and 3.6 (Acoustic Environment). Department of Homeland Security or U.S. Coast Guard Community noise levels from cumulative helicopter traffic is addressed in Section 4 of the EIS (Cumulative Impacts).<br><br>With regard to impacts to the air from training activities, Section 3.3 and 4.3 present impacts to air from the summation of all training activities. |
| 241. | City of Coronado, Office of the City Manager – James F. Benson | 17. Section 3.3.2.1.1, Emissions Evaluation Methodology, discusses emissions from ground vehicles only and should include vehicles involved in the training activities. It should also include all additional vehicles trips to get the personnel to the training (commuter trips). | There is no increase in personnel stationed at SSTC as a result in the implementation of the Proposed Action. Therefore, the analysis focused on emissions from training vehicles, aircraft, vessels, and ordnance from training activities presented in the FEIS. Appendix C, which is referenced in Section 3.3, includes the emissions calculations for all vehicles, vessels, aircraft, and ordnance used in all activities. |
| 242. | City of Coronado, Office of the City | 18. Transportation and Circulation, Page 3.14-4 last paragraph states: The Rendova Road (Gate 1) and Tarawa Road (Gate 2) intersections operate at LOS E during the busiest morning | This has been updated in the FEIS to indicate the correct LOS in both locations. |

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| | Manager – James F. Benson | commute hours and Tarawa again operates at LOS E during the busiest afternoon commute hour. This conflicts with Table 3.14-3 which has a LOS F for Tarawa in both a.m. and p.m. peak hours. | |
| 243. | City of Coronado, Office of the City Manager – James F. Benson | 19. Transportation and Circulation Page 3.14-5, second paragraph states: The City of Coronado is currently in the process of analyzing traffic conditions for SR-75 to determine the best longterm traffic solutions for the community. This project is actually the SR 75/282 Transportation Corridor Project which is analyzing traffic conditions along the corridor between the bridge and NASNI, not SR-75 adjacent to SSTC. | This paragraph has been edited to describe the appropriate traffic conditions analyzed. |
| 244. | City of Coronado, Office of the City Manager – James F. Benson | 20. Section 3.14.2.3.1 Ground Transportation indicates under Alternative 1, military training activities are estimated to generate approximately 336 ADTs. The draft EIS should analyze all trips generated from the increased activities and increased training tempo. | The ADT of all public roads was calculated for all traffic, which would include any military traffic. The EIS analyzed the Level of Service (LOS) of local roads to determine the contribution of military activities to overall traffic on public roads. Based on the analysis, increases in military training vehicle trips per day would represent less than two percent of the total daily traffic, and local roads would experience an acceptable LOS, with the exception of intersections at Gates 1 and 2; which would experience an unacceptable LOS. However, traffic generated under Alternatives 1 and 2 would represent less than one percent of the morning traffic volume and less than two percent of the evening traffic volume at these intersections, and this increased LOS would be well within the capacities of the existing regional roadway network. |
| 245. | City of Coronado, Office of the City Manager – James F. Benson | 21. 3.14-5 Summary of Effects section: Silver Strand at Rendova Road and Silver Strand at Tarawa are signalized intersections with LOS E or worse. All additional traffic generated by the increased activity should be analyzed and the amount of delay calculated in accordance with the SANTEC/ITE Guidelines for the San Diego Region. In addition, there is no mention of the number of pedestrian crossings between the bay side and ocean side of NAB, which affects the signal capacity and causes delay. The document should quantify the number of pedestrian trips across SR-75 that occur and how many more would be expected under Alternatives 1 and 2. | Activities associated with foot and/or boat traffic that transfer from the bay side to beach side (e.g. Around the World, Activity 67) would not have impacts to intersections because personnel use the SSSB tunnel to go from bay to ocean. Established beach crossing lanes are also defined. |
| 246. | City of Coronado, Office of the City Manager – James F. Benson | 22. 5.13 Transportation and Circulation section does not propose or identify mitigation for the increased transportation and circulation in the proposed alternatives. | Section 3.14.3 indicates that no adverse effects on transportation and circulation were identified; therefore, no additional mitigation measures are warranted. The information presented in Section 5.13 includes the current measures, which facilitate joint military-civilian use of SSTC consistent with safety. |
| 247. | City of Coronado, Office of the City Manager – James F. Benson | 23. List of Preparers: A Traffic Engineer was not identified under the list of preparers. Who analyzed the Transportation and Circulation sections? | Commander, Pacific Fleet staff were responsible for preparing traffic generation estimates. The contractor for the EIS (SRS-Parsons Joint Venture) used the traffic estimation data to prepare the Transportation and Circulation section of the EIS. |
| 248. | City of Coronado, Office of the City Manager – James F. | 24. The draft EIS does not identify the potential impacts to the intersections due to increased foot and boat traffic from bay side to beach side. Do the increased activities warrant reevaluation of an underpass or overpass? | Activities associated with foot and boat traffic that transfer from the bay side to beach side (e.g., Around the World, Activity 67) would not have impacts to intersections because |

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| | Benson | | personnel use the SSSB tunnel to go from bay to ocean. Established beach crossing lanes are also defined. |
| 249. | City of Coronado, Office of the City Manager – James F. Benson | Section 5-5 refers to mitigation for underwater detonations and security precautions. When planned activities are underway, will areas of the public beach/water be cordoned off? | As described in Section 3.16.3.2.3, event participants will establish an appropriate exclusion zone for each event prior to detonation. Activities are not conducted if non-participants are observed in the exclusion zone. |
| 250. | City of Coronado, Office of the City Manager – James F. Benson | Section 5-19 notes there is an interpretive sign planned for the bike trail near south Delta Beach. This sign would be located in the Scenic Highway Corridor zone and should be designed to be consistent with the overall Silver Strand Enhancement plan. | Your comment has been noted |
| 251. | City of Coronado, Office of the City Manager – James F. Benson | Table 4-1, Page 4-2 notes future planned improvements for the Navy Lodge. It notes four existing buildings and several smaller structures will be demolished and will be replaced with a lodge building to increase room capacity as well as new recreational facilities, parking, retail shops and a restaurant. What is the approximate square footage of this new facility and net increase in units? Are these additional lodge units to be temporary "resort" type facilities or housing for living purposes as a BOQ or BEQ? Are these additional housing units being proposed to accommodate expanded military operations such as the two new commands at NASNI? The draft EIS further notes in this section that along with the commands, there will be construction of a pier, boat ramp, and several buildings. Where is this project being located and could it also serve as a potential pier/boat ramp to re-instate the ferry service to NASNI that was recently discontinued? | The Navy Lodge at NASNI is located adjacent to Breaker's beach, and is a recreational, resort facility for military and retired military families – not a housing facility for sailors assigned to NBC. The Mobile Security Forces and Naval Special Clearance Team-One Pier and Boat Ramp project will assess boat ramps and piers at NASNI and NAB. An NBC Commuter Working Group is evaluating options for another pier for Coronado ferry service. |
| 252. | City of Coronado, Office of the City Manager – James F. Benson | Table 4-1, Page 4-3 briefly discusses the U.S. Navy Lighterage project, which involves construction of a waterfront command and control facility for amphibious construction Battalion One facilities to support the introduction of the improved Navy Lighterage System at NBC. The draft EIS does not describe this new system at NBC and should describe the activities associated with the system. | The activity that is associated with the Improved Navy Lighterage System (INLS) is Causeway Pier Insertion and Retraction (Activity 41), and has been analyzed by the Navy. |
| 253. | City of Coronado, Office of the City Manager – James F. Benson | Section 4.3.16, Page 4-23 Public Health and Safety cumulative analysis notes there will be momentary disruptions in communication to nearby residences and schools. The draft EIS does not identify how frequently and for what duration. The draft EIS identifies impacts associated with the expanded activities planned for SSTC individually; however, it fails to cumulatively analyze the activities combined to determine the length and period of all activities combined on the residential and school areas. For example, it appears there will be full time operation of the beach lanes at SSTC almost every day throughout the year. Where have those activities - length, time, duration - been analyzed? | Section 4.3.6 describes activities associated with the Proposed Action that could occur simultaneously (e.g., Elevated Causeway activities and Hellweek) and that could produce a cumulative intrusive noise effect. However, loud activities would rarely occur at the same time or close to each other. Therefore, the cumulative effects of these increases on ambient noise levels would be minimal. |
| 254. | City of Coronado, Office of the City Manager – James F. Benson | Table 3-1- states Coronado Beach is the only public beach in Coronado. This statement is incorrect. The Silver Strand State Beach is also located within the City of Coronado. | This statement has been removed from the table in the FEIS. |
| 255. | City of Coronado, Office of the City Manager – James F. Benson | Section 3.6.2.3.3 indicates current Breacher Training operations are 14/day when an event occurs and an event occurs 20 times per year. .The draft EIS notes operations will increase to 1,400 annually. How does the increase in activity affect the number of events per year and number per day so an assessment can be made regarding the degree of change on a daily, | As clarified in Section 3.6.2.3.3 of the FEIS, each of the 20 training activities takes approximately five days to complete, with an average of 14 shotgun blasts on each of those days. The number of shotgun blasts under the NAA is three. The |

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| | | weekly, or monthly basis? | analysis in this section is based on this increased number. |
| 256. | City of Coronado, Office of the City Manager – James F. Benson | Section 3.6.2.3.4 describes Amphibious Training operations increasing landings from 10,000 to 13,800 per year and LCAC activities (generating the most noise) will increase from 8 to 40 per year. The draft EIS identifies LCAC landings along with associated pile driving that occurs for at least 1 to 2 hours generating decibel levels of 74 to 104, 100' away. The draft EIS notes this activity has the potential to generate the largest number of increased complaints regarding noise and activity levels, particularly due to the proximity of the activity to Silver Strand housing and Silver Strand School. The draft EIS does not propose any mitigation, however, notes the training could result in sleep and communication disturbances. If the draft EIS acknowledges impacts, why aren't mitigation measures proposed? To state the Navy will advise surrounding agencies when potential impacts may occur is simply public notification and does not mitigate the related noise impacts. For example, could changes be made to the school to improve sound attenuation? | The Navy recognizes its proximity to adjacent communities, and has attempted to structure its training activities to achieve operational readiness while minimizing potential impacts to the surrounding area. The Navy does notify local public safety agencies and city governments about specific upcoming hazardous or high visibility training events consistent with NBCINST 3502.1, dated 26 Mar 2008. Local governments, in turn, are responsible for informing their communities. The Navy is determining the best solution for notification to neighboring communities and, where appropriate, additional measures for alerting the adjacent communities about events that may be considered intrusive.<br>The FEIS acknowledges that sleep or communication disturbances could occur occasionally, but concludes that the incremental effects of sound from the proposed training activities at SSTC would not have a substantial effect on the acoustic environment. Therefore, other than existing administrative controls on the placement of activities discussed in Section 3.6.1.6, no sound-related mitigation measures were proposed. With regard to changes to the school, a detailed evaluation of the existing school structures and operation (e.g., operable windows and locations of classes and other activities) would be required to determine whether its noise attenuation could be enhanced, but that is outside of the scope of the EIS since noise impacts were deemed not to be significant. |
| 257. | City of Coronado, Office of the City Manager – James F. Benson | The draft EIS does not identify the entire Silver Strand as a State Scenic Highway and the Silver Strand (bay to ocean) as a Scenic Highway Overlay zone. The draft EIS should address the potential visual and environmental impacts associated with any new large equipment or improvements that would be visible along the Silver Strand. The City and Navy have worked cooperatively in the past to eliminate unnecessary signs, dilapidated training equipment, and vertical obstructions along the Silver Strand to improve the overall aesthetic improvement to the Silver Strand and assist with Least Tern and Snowy Plover preservation efforts. | The Navy has analyzed all potential Land Use and Socioeconomic conflicts within the ROI. The increase in proposed training activities will not result in a change in the public's visual experience because training is currently being conducted on the Silver Strand. There are no proposed changes in the view shed as the majority of the training events occur near the tideline or offshore in the bay training areas or ocean boat lanes. |
| 258. | City of Coronado, Office of the City Manager – James F. Benson | The draft EIS proposes to institute beach sand berming activities, which negatively impacts the scenic highway and the public use of view corridors. For example, the berming of sand on SSTC has directly impacted the public in the past by blocking sunlight to the Solstice Clock feature in Natures Bridge (Silver Strand's Bayside Nature Trail). In December 2009, at the request of a group of citizens that meet for the winter solstice at this site, the City requested the Navy to lower the berm on December 21 so the sunlight could shine through to the Solstice Clock. The Navy was unable to accommodate this request but did not preclude this request from being | Section 3.2.3.2.2 indicates that, where training activities require natural beach contours to be altered, they are restored using bulldozers, to the extent practical, at the conclusion of the activity. These beach alterations occur above the high tideline to approximately 100 feet inland from the tideline and consist of low (2-3 foot) hummocks. Section 3.12.3.1.1 of the FEIS discusses past berming efforts that were related to least |

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| | | accommodated in the future. The draft EIS should address how berming activities will be minimized to avoid the conflicts described in this example as well as other potential berming conflicts along the Strand. This could be addressed through an action plan that identifies how City and Navy communication will be coordinated and improved to ensure present and future berming activities along the Strand do not negatively impact the Scenic Highway. | tern recovery efforts.<br><br>No Navy berming efforts adjacent to Silver Strand Highway as are associated with the Proposed Action.. |
| 259. | City of Coronado, Office of the City Manager – James F. Benson | Several years ago, the Navy bermed up areas on the ocean side of NAB. This activity affected beach sand deposits in front of the Coronado Shores. It has also appeared to accelerate beach erosion at the south end of the Shores. The draft EIS does not address sand movement for training operations and impacts. | These beach alterations occur above the high tideline to approximately 100 feet inland from the tideline, and consist of low (2-3 foot) hummocks; any beach alterations not related to training, such as those referenced in front of the Coronado Shores, are not addressed in the SSTC EIS. Section 3.2.3.2.2 addresses the potential for impacts to soils from training activities. This section also indicates that where training activities require natural beach contours to be altered, they are restored using bulldozer at the conclusion of the activity to the extent practical. Thus, training units ensure that heavy equipment use on SSTC beaches has no long-term effect on beach sands. |
| 260. | City of Coronado, Office of the City Manager – James F. Benson | Figure ES-l shows anchorage areas directly offshore of Coronado's Central Beach area, which are a direct encroachment into the public's view corridor. There are ample anchorage areas adjacent to Federal (US Navy) property; therefore, there is no necessity for anchorage areas for military craft as shown. | Anchorage's are displayed on the SSTC maps as they are shown on the NOAA Chart 18772 and Chart 18773. Anchorages are used for anchoring, towing, and mooring to buoy training, as well as anchorages for vessels support amphibious operations. The anchorages located with the ocean boat lanes are expected to be the most highly used anchorages. At these anchorages, vessels are expected to be present for training activities associated with the Proposed Action for up to four hours at a time, minimizing impacts to the public's view corridor. |
| 261. | City of Coronado, Office of the City Manager – James F. Benson | Section 3.5.243 of the draft EIS indicates that, if all increased training activities were performed individually, there would be an 85% increase in the amount of time that portions of the bay and/or ocean would be closed to public use. The report also points out that if activities occur simultaneously, that percentage would decrease. Even with that, it is not clear how the public interest is served by this monopolization of ocean and bay use by the military. This proposed increase would have a definite negative impact on public use of these natural resources. | Section 3.5.2.4.3 has been revised to indicate that the area of water that would be closed for each training activity is relatively small when compared to total bay and ocean waters available for the uses described in the Basin Plan. In addition, the durations of most training activities would be short, usually less than one day. The public would have several alternate, equally suitable ocean and bay locations that it could use during training activities. In addition, the areas would not be permanently closed to public use; closures would be temporary, and areas would be reopened at the conclusion of training. Areas closed off to use would also change from training activity to training activity. Permanent loss of water use is not anticipated for any area of the ocean or bay. For these reasons, under Alternative 1, Navy training activities at SSTC are consistent with the Basin Plan. |

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| 262. | City of Coronado, Office of the City Manager – James F. Benson | The City's beaches are already impacted by trash and other debris from a variety of sources. The draft EIS does not provide for any programs to mitigate the effects of the expanded programs adding to this trash and debris. The City is not aware of any current, ongoing program to clean the Navy's beach areas. The Navy's trash and debris, as well as that from other sources, accumulates on Navy property; tidal action and currents then deposit this trash and debris on public beaches. Expanded training activities will not only disturb buried trash and debris, releasing it into the environment; expanded water-based activities will re-suspend particulate debris deposited on the ocean bed. In summary, expanded training activities will likely lead to an increase in the amount of trash and other debris accumulating on Coronado's beaches in the area. The draft EIS should be revised to address these issues and mitigation. | The Navy recognizes its proximity to adjacent communities, and has attempted to structure its training activities and mitigation measures to achieve operational readiness while minimizing potential impacts to the surrounding area. Most of the training materials used at SSTC are non-hazardous, or are rendered non-hazardous when they function as designed (e.g., blanks). Trainees collect and remove expended materials to the extent practicable at the conclusion of their training events. Given the extent of recreational, commercial, research, and industrial operations in the ocean and bay waters adjacent to SSTC, however, a wide variety of non-military wastes accumulate on the training beaches. In the event that expended materials are found, contacting the POC at Naval Base Coronado will ensure that a team will arrive at the site, identify the item, and properly remove it. |
| 263. | City of Coronado, Office of the City Manager – James F. Benson | The draft EIS refers to OPNAVINST 5090.1 in several locations; however, this document was not provided as an attachment. Some sections of the report indicate that the discharge of bilge water and grey water is not allowed; other sections of the report seem to indicate that this discharge is allowed under certain conditions. Discharge of grey water and/or bilge water from any Navy vessel in the training area should be prohibited for any reason. | OPNAVINST 5090.1 is cited in the FEIS as a reference, and thus it is not included as an attachment to the document. Additionally, sections have been revised to clarify that discharges of grey or bilge water are not allowed under any conditions. |
| 264. | City of Coronado, Office of the City Manager – James F. Benson | The draft EIS describes training activities, which would include the creation of salt water ponds for temperature training. This ponded water would experience human contact for extended periods of time. Any ponded water used for this type of training should be tested to ensure that it meets established water quality standards prior to release back to the ocean and/or bay. The draft EIS should be revised to address this issue. | Section 3.1.1.4.3 of the FEIS indicates that this ponding of water typically occurs only on a single day, and would not experience human contact for extended periods. As indicated in the same section, water is not released directly into the ocean or bay, it percolates through the sand. |
| 265. | City of Coronado, Office of the City Manager – James F. Benson | The draft EIS should further discuss, explain and analyze the permit for reverse osmosis water purification and unit discharge into the Bay and Ocean as discussed in Chapter 6 of the draft EIS. | Under current conditions discussed in Section 3.4.2.2 of the FEIS and under Alternative 1 and 2, wastes from training activities at SSTC include waste petroleum products, used coolants, various types of expended training materials, brine and backwash from the ROWPU training, and batteries. Most of these waste types are nonhazardous, some (e.g., batteries) may qualify as universal wastes (wastes that are not designated as hazardous wastes, but containing materials that need to be prevented from release into the environment), and some are hazardous under RCRA. Hazardous wastes are stored in satellite accumulation areas on SSTC and in a 90-day storage area at NAB Coronado, and transported along SR-75 by truck to regional hazardous waste TSD facilities. Chapter 6 indicates that a amendment request has been filed, but at this time, water from ROWPU activities is containerized and transported offsite for disposal. |
| 266. | City of Coronado, | In the course of describing training activities, the draft EIS indicated that some running exercises | The SSTC Biological Opinion from the US Fish and Wildlife |

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| | Office of the City Manager – James F. Benson | would be performed with military working dogs traversing beach areas. Dogs are prohibited on the City's beaches, except for the area designated as Dog Beach, located at the northwest end of the City's Central Beach, near the Air Station's Ocean Boulevard gate. | Service outlines the constraints on military dog training on portions of SSTC-N and SSTC-S. Military dogs are not allowed outside of these areas until the Navy completes a study on the effects of military dogs on nesting birds. Section 3.11 of the FEIS clarifies that military working dogs "are typically on the hard packed sand (SSTC-S) or sand road (SSTC-N), they can also be on the soft packed sand in both areas." |
| 267. | Department of Transportation | The California Department of Transportation (Caltrans) appreciates the opportunity to have reviewed the Draft Environmental Impact Statement (DElS) for the Silver Strand Training Complex Project located along State Route 75 (SR-75) south of the City of Coronado. Caltrans has the following comments:<br><br>The AM peak Intersection Volumes at Rendova Road is 3,328 with level of service (LOS) E. The AM peak and PM peak Intersection Volumes at Tarawa Road are 3,284 and 3,406 with LOS F. These two intersections LOS are exceeding Caltrans threshold to maintain a target LOS between "C" and "0". Any trips added to an intersection already operating at LOS F typically reduces the intersection measure of effectiveness (MOE operating capacity). A corridor segment or intersection currently operating at LOS F has reached its maximum effective operating capacity. Any additional trips added without maintaining the existing MOE's would further degrade the operational function and does not allow an intersection or segment to continue to operate within its capacity, as the segment or intersection has failed. Significant delays are expected at an intersection or roadway segment operating at LOS F. This should be documented as such in the EIS. The above intersections should also be analyzed for Existing plus Project to specify the significance of traffic generated by Marine activities additional trips.<br><br>On page 3.14-4 to 3.14-5, the Rendova Road intersection operates at LOS E during the AM peak hour; and Tarawa Road intersection operates at LOS F for both AM peak and PM peak hour. Please revise.<br><br>On page3.14-5, section 3.14.1.4.2 Traffic volumes along Palm Avenue between 2005 and 2006 have decreased by 39%. The same applies for Table 3.14-4. Please revise.<br><br>The Traffic impact Analysis (TIA) within the EIS did not address potential increase (or decrease) in pedestrian related trips at the analyzed intersections. The TIA should address the potential impacts that may occur as a result of any increase in pedestrian trips from Oceanside training to bayside training etc. Increased pedestrian trips can have a substantial impact on intersection operations, as the existing pedestrian crossing time may not be adequate to handle additional trips and may require the pedestrian crossing phase time to be increased to meet the added demand, thus lowering the overall capacity of intersections where this may occur. This would be especially important to know for the peak periods analyzed within the TIA.<br>Any reduction in pedestrian trips during the peak periods that may increase the capacity of any | The LOS for Tarawa and Rendova have been added to Section 3.14.1.4.1 of the FEIS, and text has been added about the operating capacity of roads at a LOS F.<br><br>The decrease in traffic volumes from 2005-2006 has been revised to 39% and amended in table 3.14-4.<br><br>Regarding pedestrian increases in signal phase time, there are no new eating facilities or pedestrian destinations that would affect signal phases. There is no increase in personnel stationed at SSTC as a result in the implementation of the Proposed Action. The Proposed Action does include an increase in activities performed by existing personnel. The activities associated with the Proposed Action will be increased but will not increase the signal phase times at NAB intersections. |

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| | | of the signalized intersections analyzed, such as new eating facilities on the beach side training facility, which would reduce the need for trips at the analyzed intersections would be helpful to note as well.<br><br>Based on the inclusion of these revisions to the EIS. Caltrans has no further comments. If you have any questions or require further information, please contact Christian Bushong at (619) 688-2510 or Christian.Bushong@dol.ca.gov. | |
| 268. | Environmental Protection Agency, Region IX | Water Resources<br>Vernal Pools<br>As stated in EPA's website (http://www.epa.gov/wetlands/types/vemal.html), "[m]ore than 90% of California's vernal pools have already been lost. Great efforts are being made to protect the remaining vernal pools, as their disappearance marks the loss of rare and important habitat and some of the associated plant and animal species as well." At the Silver Strand Training Complex South (SSTC-S), the vernal pools cover 3.2 acres in total (Table 3.11-1). Additionally, many contain endangered San Diego fairy shrimp "found in 11 of 25 vernal pools and salt marshes surveyed" (page 3.11-12).<br>In the preferred alternative, the DEIS states on page ES-IO, "[t]he Navy would allow limited training involving foot traffic,. but not vehicle traffic, in the vernal pools when vernal pool conditions are determined to be dry." The DEIS also states in Table 3.11-4, "[d]ry conditions would be determined by a qualified person overseen by a NBC [Naval Base Coronado] Botanist or Wildlife Biologist." While foot traffic in the vernal pools when the soil is dry and hard is unlikely to damage fairy shrimp, determining when the pools are dry enough for foot traffic is complex.<br><br>Recommendation:<br>EPA recommends the Navy work with U.S. Fish and Wildlife Service to identify the highest quality vernal pools, and fence those to minimize impacts from training.<br>Alternatively, EPA suggests | The Navy's analysis was based on the best available science; however, there is inherent variability and uncertainty in occupancy of the vernal pools. For this reason, the Navy does not know the impact of introducing training to this area. As part of the conditions of the Biological Opinion, the Navy will be completing a Vernal Pool Management and Monitoring Plan to help determine whether the impacts identified in the EIS remain at the low levels expected. The Plan will include a focused invasive plant inspection survey in the pools and their watersheds; plant, topographic, hydrological, and water quality surveys (including salinity); and protocol fairy shrimp surveys. In addition, the Navy will be determining the baseline distribution and abundance of San Diego fairy shrimp and the condition of the vernal pool habitat prior to initiating training activities in or around the vernal pools at SSTC-S Inland. If impacts are more substantial than the low levels anticipated or if impacts could lead to the extirpation of fairy shrimp from any individual pool, then the Navy will reinitiate consultation |

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| | | • the FEIS commit to an inspection of vernal pools by a wildlife biologist, prior to upland training at beach Purple 2, or<br>• the FEIS list the factors that will be used to determine the vernal pools are dry enough to withstand foot traffic'. | with the USFWS.<br><br>The Navy will avoid the occupied vernal pools and their watersheds adjacent to the road at SSTC-S Inland (i.e., pools 1 through 7 marked with flexi-stakes) year-round, to the maximum extent consistent with training needs. Foot traffic when the pools are dry consists primarily of small groups. As presented in Section 3.11 of the FEIS, trail forming and soil compaction are unlikely, resulting in no impact to population viability. Additionally, the Navy has completed consultation with the USFWS, and has received a signed Biological Opinion which concludes that proposed training activities will not jeopardize the continued existence of San Diego fairy shrimp. |
| 269. | Environmental Protection Agency, Region IX | Water Resources<br>Sediment Quality<br>The DEIS states on page 3.5-14, "[r]ecent sediment sampling in the San Diego Bay near SSTC-N indicates - while concentrations of some contaminants are elevated above background levels - no contaminants were present at the concentrations which would adversely affect marine organisms (Port of San Diego 2002)." EPA encourages a fuller discussion of sediment sampling results near SSTC-N and any screening levels used to determine that no contaminants were present at concentrations of concern. The purpose of the sediment sampling in the report cited (San Diego Harbor Deepening EIS/EIR, USACOE, November25, 2002) most likely was intended to characterize the quality of the sediment to be dredged, and may not have specifically addressed the sediment at SSTC-N. Even more so than dredging, underwater explosions are likely to make contaminated sediments bioavailable to fish and marine mammals.<br><br>Recommendation:<br>The FEIS should provide additional discussions of sediment sampling at SSTC-N, including a brief description of the number of samples, depth of sampling and contaminant concentrations. | The sediment sampling for the San Diego Harbor Deepening project was, as indicated in the comment, performed not to identify contaminant hotspots but to characterize the general quality of a large quantity of Bay sediments intended for ocean disposal. Such samples are likely to be more representative of general conditions in the Bay than samples collected in known or suspected contaminant hot spots. The Navy is not aware of any other relevant sediment sampling in the vicinity of the SSTC training areas. |
| 270. | Environmental Protection Agency, Region IX | Biological Resources<br>Least Terns<br>The DEIS discusses physical training for groups averaging 30 - 150 people (Table 2-1, page 2-24), and includes that "trainees may occasionally have a military working dog participate in the physical conditioning." Page 3.11-39 also clarifies that military working dogs "are typically on the hard packed sand (SSTC-S) or sand road (SSTC-N), they can also be on the soft packed sand in both areas." While federal endangered least terns may have acclimated to the presence of humans nearby, barking dogs in nesting areas does not seem prudent, particularly when exercise in the nearby hard packed sand would be much less intrusive. | As listed in Section 5 and as described in the signed Biological Opinion (July 7, 2010) from USFWS, military working dog handlers will be notified weekly of the locations of plover nests and, to the maximum extent possible, remain a minimum of 30 m (90 ft) from markers that delineate the locations of nesting plovers. Outside of the nesting season (15 Sept through end of February), training may occur unencumbered. |

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| | | Recommendation:<br>The FEIS should include a mitigation measure that avoids conditioning military working dogs in least tern nesting areas (i.e. the soft packed sand of Blue 2, Orange I and Orange 2). | If physical conditioning on soft pack sand is necessary, handlers and military working dogs will run on the sand road (SSTC-N) or within 20 feet of the hard pack sand to reduce the disturbance and impact to nesting terns and plovers. At SSTC-N, military working dogs will exercise primarily between beach lanes Yellow 1 and Blue 1, where they may cross the beach to get to the sand road at the existing route immediately to the north of the demo pit. The Navy will not conduct physical conditioning using dogs in the southern three beach lanes until: a) completing a study to evaluate the effects of military working dogs on terns and plovers and b) coordinating with the USFWS to develop conservation measures to minimize any additional effects.<br><br>If military working dog training is requested as part of Platoon Over-the-Beach activities at SSTC-N, these activities will be scheduled in beach lanes Yellow 1, the northern half of Yellow 2, Green 1, or Green 2, pending the results of the Navy's study to evaluate the response of terns and plovers to military working dog presence.<br><br>The Navy will coordinate with USFWS in the development of the study to evaluate the effects of military working dogs on terns and plovers and will submit the study design and scope of work to USFWS for review and approval. The Navy will allow USFWS 30 days to submit comments and an additional 30 days to approve the final study design and scope of work. |

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| 271. | Environmental Protection Agency, Region IX | Waste Minimization<br>EPA recognizes the Naval Region Southwest's commitment to sustainability, including renewable energy, water conservation, green buildings and more. We commend the Navy for "pumping seawater through its Offshore Petroleum Discharge System during training, instead of using petroleum products." In comparison, the DEIS does not explain whether a high level of scrutiny has been applied to the explosive training exercises, although it does identify potential munitions constituents of concern and explosives residue (on page 3A-I 0 and 11). EPA acknowledges that in many instances the success of training exercise may not be judged without using the actual amount of explosive also used in field conditions, however, that may not be the case for all explosives training exercises.<br>Recommendation:<br>The FEIS should assess the potential to reduce explosive charges in meeting its training needs. | As discussed in Section 2.1.3.3 of the FEIS, a reduction in underwater mine countermeasures was considered but eliminated because it would not support the Navy's ability to meet training requirements consistent with the Fleet Readiness Training Plan (FRTP) (criteria #2 and #6, Section 2.1.2 of the FEIS). A reduction in the types, or tempo of training activities available at SSTC would mean that local units and users would have to routinely travel to other range complexes to fulfill training requirements. As outlined in Section 2.1.3.1 of the FEIS, this is not a feasible alternative. For these reasons, this alternative has been eliminated from further consideration in the EIS. |
| 272. | Environmental Protection Agency, Region IX | Clarification of Baseline Training Tempo<br>Various sections of the DEIS provide information on baseline training tempo, including Table 2-1. EPA encourages a more thorough discussion of the development of the baseline training tempo, to clarify the concept. The FEIS should, for example, explain whether the values in Table 2-1 represent the amount of training conducted in a specific year or the amount of training that could be conducted given the current restrictions on training. Where the baseline training tempo is not reflective of recent training activities, EPA suggests the FEIS include a comparison with recent training activities. This will foster better understanding of the FEIS. EPA is not suggesting additional factors need to be used for comparison throughout the FEIS, only that it should link training tempo to recent levels of training at SSTC. | The tempo and types of training activities have fluctuated within SSTC due to changing environments, the introduction of new technologies, the dynamic nature of international events, advances in warfighting doctrine and procedures, and force structure changes. Such developments have influenced the frequency, duration, intensity, and location of required training. The factors influencing tempo and types of operations are fluid in nature, and will continue to cause year-to-year fluctuations in training activities at SSTC.<br><br>The Navy established its baseline training tempo by considering available historical usage data at SSTC, specifically, from 2001 through 2007. During this period, the U.S. military commenced operations in Afghanistan and Iraq as part of the Global War on Terror. Many of the units that would normally be training at SSTC were deployed overseas. Additionally, the focus of the individual and unit training temporarily shifted to inland (desert or mountainous) environments to prepare personnel for conditions they would encounter in combat operations overseas. As such, SSTC has experienced a temporary decrease in training usage and tempo during the period being evaluated (2001 through 2007). To |

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| | | | establish baseline training tempos, the Navy evaluated available 2001 through 2007 training data, considering year-to-year fluctuations as well as the recent progressive decline in training tempo at SSTC. For each training activity, the Navy selected 2001- 2007 data that were most reflective of the average historical training conditions over the past few decades. |
| 273. | Federal Emergency Management Agency, Region IX | Please review the current effective countywide Flood Insurance Rate Maps (FIRMs) for the County of San Diego (Community Number 060284), and Cities of Coronado (Community Number 060287) and Imperial Beach (Community Number 060291), Maps revised September 29, 2006. Please note that the Cities of Coronado and Imperial Beach, San Diego County, California are participants in the National Flood Insurance Program (NFIP). The minimum, basic NFIP floodplain management building requirements are described in Vol. 44 Code of Federal Regulations (44 CFR), Sections 59 through 65.<br>A summary of these NFIP floodplain management building requirements are as follows:<br>All buildings constructed within a riverine floodplain, (i.e., Flood Zones A, AO, AH, AE, and Al through A30 as delineated on the FIRM), must be elevated so that the lowest floor is at or above the Base Flood Elevation level in accordance with the effective Flood Insurance Rate Map.<br>If the area of construction is located within a Regulatory Floodway as delineated on the FIRM, any development must not increase base flood elevation levels. The term development means any man-made change to improved or unimproved real estate, including but not limited to buildings, other structures, mining, dredging, filling, grading, paving, excavation or drilling operations, and storage of equipment or materials. A hydrologic and hydraulic analysis must be performed prior to the start of development, and must demonstrate that the development would not cause any rise in base flood levels. No rise is permitted within regulatory floodways.<br>All buildings constructed within a coastal high hazard area, (any of the "V" Flood Zones as delineated on the FIRM), must be elevated on pilings and columns, so that the lowest horizontal structural member, (excluding the pilings and columns), is elevated to or above the base flood elevation level. In addition, the posts and pilings foundation and the structure attached thereto, is anchored to resist flotation, collapse and lateral movement due to the effects of wind and water loads acting simultaneously on all building components.<br>Upon completion of any development that changes existing Special Flood Hazard Areas, the NFIP directs all participating communities to submit the appropriate hydrologic and hydraulic data to FEMA for a FIRM revision. In accordance with 44 CFR, Section 65.3, as soon as practicable, but not later than six months after such data becomes available, a community shall | Thank you for the list of references that should be reviewed. Because the EIS only analyzed activities associated with training at SSTC, of which there are no development or construction activities, the information that you have provided has been forwarded to the appropriate personnel and will be consulted prior to any future construction or development activity. |

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| | | notify FEMA of the changes by submitting technical data for a flood map revision. To obtain copies of FEMA's Flood Map Revision Application Packages, please refer to the FEMA website at http://www.fema.gov/business/ntip/forms.shtm.<br>Please Note: Many NFIP participating communities have adopted floodplain management building requirements which are more restrictive than the minimum federal standards described in 44 CFR. Please contact the local community's floodplain manager for more information on local floodplain management building requirements. | |
| 274. | San Diego County Archaeological Society, Inc. | 1. The DEIS describes actions the Navy routinely takes to avoid significant impacts to cultural resources, such as notification of restrictions prior to activities. What actions does the Navy take to audit the effectiveness of impact avoidance? Is there a periodic monitoring or inspection program, with provision for remedial action should any problems be identified?<br>2. The DEIS considers potential impacts to ground-disturbing activities "in the immediate area of an archaeological site" (see Section 3.13.2). It does not address the possibility of such activities impacting buried sites. A monitoring program is warranted for areas where previously-undisturbed subsurface areas will be subjected to excavation, grading or similar disturbances. Both archaeological and Native American monitors need to be part of such a monitoring program.<br>3. Please explain where the collections from previous archaeological investigations on the SSTC are curated. An inspection of the listing of curated collections at the San Diego Archaeological Center identified none of the sites listed (other than an apparent error for SDI-13968, which is listed for a site inventory project on Camp Pendleton). Are the collections curated at another facility meeting the requirements of 36CFR79? If not, what actions will be taken to bring their curation status into compliance with 36CFR79?<br>SDCAS appreciates the opportunity to participate in the navy's environmental review process for this important project. | 1 - Under existing management protocols of the NB Coronado Cultural Resources Management Program (CRMP), periodic inspections are conducted of all NB Coronado installations, including the SSTC, to monitor land use on areas of known archaeological sensitivity. Similarly, CRMP personnel frequently conduct project-specific inspections and joint site visits under the NB Coronado Site Approval Request (SAR) process. Both monitoring processes are prescribed under stipulations of the 2003 San Diego Metro Area Programmatic Agreement (Metro Area PA). Any problems or conflicts noted during monitoring are reported to the responsible NB Coronado command authority and addressed administratively. Professional investigations have identified eligible and potentially eligible properties within the CNRSW Metro ROI. In conjunction with ICRMP development and as future investigations, CNRSW will determine if additional properties in the Metro ROI not previously evaluated may be eligible. CNRSW will ensure that all new construction, alterations, equipment installation, structure modifications, or repairs and maintenance on land, buildings, or structures will be reviewed for potential effects to historic properties.<br><br>2 - By prescription, this EIS limits its analyses to operational training activities. Construction activities related to the |

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| | | | development of infrastructure supporting operations or other systems on the SSTC, maintenance and repair on existing infrastructure, or the demolition of facilities, will be processed separately and individually under NEPA. These supplemental NEPA reviews are processed through the NB Coronado PWO, where they will be subject to application of historic preservation review by the CRMP Archaeologist under the Metro Area PA. Stipulation 9 of the Metro Area PA provides that the CRMP "will ensure that ground-disturbing activities include appropriate measures to protect archaeological resources," including, as appropriate, "archaeological monitoring of ground disturbing activities within areas of known or provisional archaeological sensitivity."<br><br>3 - Collections deriving from SSTC sites are of limited value, in part due to the nature of the testing projects involved, but also related to the content or condition of the site areas tested. For instance, the site CA-SDI-13968 referenced in the comment is a remnant prehistoric deposit located in the southeastern quadrant of SSTC South, where its original extent has been bisected by the construction and reconstruction of SR75 beginning in the early 1940s. Archaeological testing there in 2001 was limited to the alignment for the eventual burial of overhead power lines with the goal of assessing if any intact site deposit might lie below the incised SR75 road shoulder. The testing determined that the underlying soil was the undisturbed, sterile native geology, and no testing was applied to other, less disturbed areas of the recorded site away from the proposed trenching. Accordingly, no collections were forthcoming from testing this particular locus. Other testing conducted during the 2001 effort at sites CA-SDI-5514 and -5454/12270 produced a small volume of collections which remain in the custody of the consultant pending Navy funding to archive these at the SDAC. Such funding has become available in FY10, and these materials are expected to be moved to the SDAC in Summer 2010. Site eligibility evaluation testing conducted in 2006 on recorded sites CA-SDI-57, CA-SDI-13964, CA-SDI-13966, CA-SDI-13969, and CA-SDI-13972 produced a minimal quality of materials which were determined to derive from very disturbed contexts and lacked any integrity of their origin. These were not added to any collections. |

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| 275. | San Diego Audubon Society | The San Diego Audubon Society is very concerned with the proposed project. We greatly appreciate the current efforts of the Navy to protect and enhance the safe nesting of California Least Terns and Western Snowy Plovers on the Silver Strand. Section 5.11.1 is a very interesting history of Navy environmental responsibility and leadership. We also appreciate the expanded training needs for the Navy because of our Nation's current high level of military activity. However, we think that the plan needs to be more protective than the current Alternative 1 or 2. Therefore we support the No Project alternative unless Alternate 1 can be improved substantially. We strongly urge that Alternative 2 not be selected because of its large and irresponsible impact on least terns and snowy plovers. The San Diego Audubon Society also supports the Bay Council letter to which we are a cosigner. | The models developed to assess impacts to the California least tern and western snowy plover from proposed military training have been improved, in response to the Audubon Society and other public comments that have been received (see Sections 3.12.3.1 and 3.12.3.2 of the FEIS). The models and analysis now also consider historical take levels and estimate average future take levels, in addition to overly-conservative take levels. The improved models anticipate that impacts to the California least tern and western snowy plover will be minimal under both the No Action Alternative and Alternative 1, and will be mitigated through the Navy's extensive management program. |
| 276. | San Diego Audubon Society | IMPACTS ON LEAST TERNS<br>The population of Least Terns has risen substantially over the last 15 years, as the EIS shows. But, the reproduction of Least Terns has generally been declining over the last decade as the EIS also shows. This suggests that the species is not doing nearly as well as it looks. It is also thought that the average age of the birds is increasing, which could reduce future reproductive success. This is clearly not a good time to increase the take of the species, particularly when that take is avoidable. We will be more specific in the following subheadings.<br><br>CUMULATIVE IMPACTS NOT ADDRESSED, LEAST TERNS<br>The EIS provided a long list of likely activities for which the cumulative impacts have been addressed. We are concerned that several very relevant activities were not addressed that, when combined with Alternative 1 or 2 could help put the recovery, and perhaps even the survival of the species in jeopardy.<br><br>The U.S. Fish and Wildlife Service has proposed downlisting the least terns from Endangered to Threatened. This would reduce the priority for funds, for priority for other resources such as locations for new nesting areas, negotiating site management agreements, predator management, protection and enhancement of the fish needed for foraging, research, monitoring, planning, analysis, site maintenance, etc. This reduction in resources and priorities will take a toll on the species, in both predictable and unpredictable ways.<br><br>Global Climate Change appears to be making the quantity and timing of the supply of small fish for least tern consumption more variable and more uncertain. This affects the likelihood that chicks will survive. Changes are happening very quickly which could leave the entire population more vulnerable.<br><br>The impacts of Gull-bill terns on tern reproductive have been significant and appear to be increasing. There appears to be no real progress toward identifying how to manage the two | Downlisting the least tern does not affect Navy funding priorities in its INRMPs - Endangered and Threatened species are classified with the same funding priority. The Navy is contributing to research on climate change and least tern foraging habits in San Diego Bay. Gull-billed tern predation studies are also underway by the Navy and other funders (including USFWS), and the Navy has requested approval from USFWS to relocate Gull-billed terns, without success. A species viability analysis is under consideration for funding. The USFWS has not officially proposed the California least tern for downlisting. If and when it does, the proposal will be published in the Federal Register and will be open for public comment before a final decision is made.<br><br>The Navy is working closely with the USFWS to assist it in addressing gull billed tern predation and impacts to western snowy plover and California least tern. The Navy has submitted an application for a depredation permit to the USFWS Division of Migratory Bird Management annually since 2005, and has continued to document the impacts of this species. The Navy is supporting a radio-telemetry study by SDSU and USFWS during the 2010 nesting season. This study will research movements of gull billed terns around San |

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| | | species to assure the recovery of least terns. This lack of resolution is likely to result in a large and unmanaged take of least terns for at least several years while regulations are developed, reviewed, and finally implemented.<br><br>The Recovery Plan for least terns is almost three decades old and is based on outdated information. As a result, there is no effective comprehensive and broadly accepted plan for the recovery of least terns. This deficiency in planning and management means that there is no valid way to conclude that the additional take proposed by Alternatives 1 or 2 will not help put the species in jeopardy.<br><br>We urge that the EIS acknowledge each of the additional cumulative impacts mentioned above and incorporate their effects into its analysis. | Diego Bay and analyze diet.<br><br>The Navy agrees that the California Least Tern Recovery Plan needs to be updated to address current concerns facing California least tern recovery efforts. As listed in the FEIS and in the signed USFWS Biological Opinion (July 7, 2010), the Navy supports the USFWS with annual site specific data and monitoring of the least tern on Navy property. The Navy also encourages the USFWS to update the Plan so that the Navy, as an agency responsible for working towards recovery, can understand how to best attain this important goal. The Navy intends to continue vigilant and adaptive management of least terns, and as well as monitor take. Take will be monitored and course adjustments made. |
| 277. | San Diego Audubon Society | SPECIES VIABILITY ANALYSIS, LEAST TERNS<br>The Species Viability Analysis is based on reproduction rates measured in 1981 to 1984, according to page 3.12-21. At this time the productivity was 0.62 fledgling per nest in good years and 0.27 for years dominated by El Nino/Southern Oscillation (ENSO). The ENSO influence was expected about one out of seven years.<br><br>According to a figure in the handout from the public presentation, in the last 8, the good years have had productivity around 0.15 for the good years and 0.05 for the bad ones. It appears that we have had 8 bad years in a row vs. the one bad year in seven anticipated in the Species Viability Analysis.<br><br>As mentioned above the Species Viability analysis assumes one ENSO year for every 7 normal years. However, some climate models now suggest that with global warming the average may become more like the ENSO state which will make least tern reproduction more difficult.<br><br>The model also does not address other trends that could increase the risk to the food supply for least tern recovery such ocean warming, reduced oxygen levels in the ocean, and ocean acidification. Each of these issues suggests that the Species Viability Model is probably wildly optimistic.<br><br>We urge that this EIS not conclude that a lower population of least terns will not jeopardize the recovery of the species unless that conclusion can be substantiated with current and relevant data and the best analysis of future trends. Such an analysis should also incorporate the effects of the cumulative impacts listed previously in this letter. Any model used should include the | The Navy understands the problems with the model. Efforts to model least tern population viability have been frustrated by incomplete information about the species' demography, effects of environmental stochasticity, and wintering habitat location. An update of the Species Viability Model is needed; however, it is currently the best available science. The Navy sees its responsibility as contributing to recovery. The FEIS attempts to quantify the benefit provided by the Navy of its personnel dedicated primarily to this program and onsite maintenance and monitoring. The Navy is no longer relying solely on the model to conclude that minimal additional impacts to California least tern and western snowy plover are expected under the Proposed Action. The Navy may be required under the Biological Opinion to re-initiate consultation with USFWS if the population of California least tern or Western snowy plover on NBC decline below 2005-2009 baseline nesting levels and Navy and USFWS evaluations determine that the decline is due to the impacts from of military training. |

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| | | uncertainty range of the input information, the uncertainties of the assumptions the model is based on, how the uncertainties propagate through the model, and the uncertainty of the results. A model that produces a number without clear quantification of the uncertainty of that number will probably be more misleading than useful.<br><br>The species viability analysis only appears to address keeping the species from declining to extinction. The purpose of the Endangered Species Act is recovery. This analysis needs to be redirected to identify a population and population growth rate that will lead to a high probability of recovery of CA least terns in a reasonable period of time. | |
| 278. | San Diego Audubon Society | IMPACTS ON WESTERN SNOWY PLOVERS<br>The EIS proposes a maximum number of 22 Snowy Plover nests that will be marked for protection. Other nests, eggs, and chicks will be unmarked. As they are very well camouflaged the destruction of a large number of chicks and eggs appears likely. The EIS fails to provide any analysis to quantify the likely number of unmarked nests, eggs, and chicks in the lanes would be destroyed accidentally. But it concludes that this will not be a significant impact with no data or analysis to support this conclusion.<br><br>From 2005 to 2009, Snowy Plover population on the West Coast has declined about 13%. The Recovery Plan emphasizes the need for increased protection of nesting areas to allow recovery. Backing off on protection of these nests appears to be a significant risk to the viability of this species and directly contradicts the recommendations of the Recovery Plan.<br><br>EIS also fails to provide any direct mitigation for the losses of Western Snowy Plovers that will be caused by this project as is required by NEPA. Ironically the protection of these three lanes during nesting season was provided as mitigation for the losses that were anticipated for the other 11 lanes. In view of this, If this project is implemented, we strongly urge that the EIS provide estimates of anticipated losses of WSPs from the training operations on all of the 14 Silver Strand project area and provide adequate mitigation to directly offset those losses in all 14 lanes. | The Navy does analyze expected take of chicks in worst case and No Action scenarios. The numbers are not a population-level effect, and so they will not affect the viability of the species. Measures are in place to ensure long-term viability of Navy sites for nesting, and for adaptive management. Mitigation for any losses is provided through management, including predator control and site enhancement. It is true that most of the western snowy plover benefit has occurred incidental to California least tern protection. The Navy has conducted an additional impact analysis for western snowy plover. The analysis found that the likelihood of unbuffered western snowy plover nests being impacted by military training is low even though they are well camouflaged (Section 3.12.3.2 of the FEIS). The Navy has provided additional information about its proposed mitigation. Proposed mitigation is expected to well-compensate for the few nests that could be lost under the revised buffering criteria. The Navy is working closely with the USFWS to assist it in addressing gull billed tern predation and impacts to western snowy plover and California least tern. The Navy has submitted an application for a depredation permit to the USFWS Division of Migratory Bird Management annually since 2005 and has continued to document the impacts of this species. The Navy is supporting a radio-telemetry study by SDSU and USFWS during the 2010 nesting season. This study will research movements of gull billed terns around San Diego Bay and analyze diet. |

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| 279. | San Diego Audubon Society | BIOLOGICAL OPINION NOT AVAILABLE<br>The Biological Opinion from the US Fish and Wildlife Service will have an important impact on the future of this project. It is inappropriate that the public must review this EIS without seeing the final Biological Opinion for the project. The BO would provide additional information and the opinion of the FWS. It is essential that reviewers be able to review this opinion and its background information and see how the Navy intends to deal with that opinion.<br><br>We strongly urge that the DEIS be re-circulated for comment after the BO is received, its results are integrated into the project, and the mitigation is identified. This transparency is especially important for this project in view of its large potential impacts on two very important at-risk species. If the public is only allowed to see this information in the FEIS, there will be no formal comment period, and the public will have been denied the intended benefits of the NEPA process. | The information and mitigation measures from the signed Biological Opinion (July 7, 2010) have been incorporated into the appropriate sections of the EIS, including the conclusion. |
| 280. | San Diego Audubon Society | IMPACT OF NOISE AND DISTURBANCE ON LEAST TERNS AND SNOWY PLOVERS<br>We were pleased to see the substantial analysis of the average and peak noise resulting from the project in Section 3.6, ACOUSTIC ENVIRONMENT. But we were extremely disappointed to discover that the noise analysis was only related to "sensitive receptors" of the human kind. The EIS provides no analysis to determine if the increases in average noise or peak noise from the increases in gunfire, flares, and detonation would result in a take, or a reduction of reproductive success, of least terns or snowy plovers. This loss could result from either least terns or snowy plovers being deterred from nesting or abandoning eggs or chicks because of the additional noise, either on the ocean side or the bay side of the Silver Strand.<br><br>We strongly urge that the EIS include analysis of the indirect take of chicks and eggs that will result from permanent nest abandonment that is likely to result from the increase in noise, both average and peak. We also urge that the EIS include analysis of the indirect take of chicks and eggs that is likely to result from temporary abandonment that would make the eggs and chicks more vulnerable to death from heat, cold, predators, and starvation. | The Navy agrees that the California Least Tern Recovery Plan needs to be updated to address current concerns facing California least tern recovery efforts. The Navy supports the USFWS with annual site-specific data and monitoring of the California least tern on Navy property. The Navy also encourages the USFWS to update the Plan so that the Navy, as an agency responsible for working towards recovery, can understand how to best attain this important goal.<br>This is a high ambient noise environment in which nesting persists. The Navy has achieved nesting success adjacent to the North Island airfield, which is a very high noise environment. The FEIS addresses noise and its effects on the least tern and snowy plover. |

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| 281. | San Diego Audubon Society | ALTERNATIVES<br>The limited range of alternatives that are presented in the EIS do not provide a reasonable starting point for a productive process to resolve the project's operational and environmental problems. The lack of meaningful alternatives is not consistent with the letter or intent of NEPA. We urge that the EIS alternatives be expanded to lead to a reasonable solution to the Navy's training issues.<br><br>The EIS needs to provide an alternative that identifies scheduling efficiencies that will preserve the land portion of blue 2, orange 1, and orange 2 during nesting season. A very large portion of the use of the training area is for physical fitness training which provides considerable opportunities for more efficient use of the area. The EIS's allegation that expanding operations into those three lanes is essential to the mission is not supported by any specific information provided in the EIS.<br><br>Many of the missions that are proposed can be accomplished in the water section of the lanes, with virtually no beach access. We urge that the uses of lanes blue 2, orange 1, and orange 2 be limited to those water-only missions during nesting season. Needed access for them could be by boat vs. land. If emergency access is occasionally needed over the beach, that could be considered valid unavoidable "incidental take." Such an alternative should be developed and analyzed.<br><br>We also urge that an alternative be analyzed that allows lanes at Camp Pendleton to be used to relieve some of the scheduling pressure on the Silver Strand Beach Lanes without destroying least tern and snowy plover eggs and chicks.<br><br>We strongly urge that a set if meaningful alternatives be identified that will address the Navy's training needs in a much more environmentally protective manner. Such an alternative is essential to satisfy the letter and the intent of NEPA. | As described in Section 2.1 of the EIS, possible alternate locations for training have been explored through criteria that were established to aid in the determination of the feasibility of a site or range for training. Due to a number of factors (training area availability, environmental constraints, proximity to base, etc.), other sites were determined to not be reasonable locations for training; please see Section 2.1.3 of the FEIS. A specific example (for Camp Pendleton) is now provided in the EIS to illustrate why alternate locations are not feasible. Alternative locations for training, such as Camp Pendleton were analyzed, and found not to meet the military training needs (Section 2.1.3.1 of the FEIS). Additionally, alternatives were eliminated that investigated the distribution of military activities to different locations within SSTC.<br><br>While the Navy appreciates your recommendation for public assistance in rehearsals, the general public is prohibited from participating in these training activities for both military security and public safety. An explanation of why the Navy needs to use Lanes 8, 9, and 10 is provided in Sections 1.5.1.1, 1.5.1.2, 1.5.1.3, and 3.12.3.1 of the FEIS.<br><br>All alternatives in the EIS propose scheduling efficiencies that reduce the potential for take of listed species. As discussed in Section 3.12.1.5.3 of the FEIS, beach scheduling procedures bias activities with heavier beach usage towards beach lanes with fewer nests, when it does not impact the realism of training or training needs. This means that heavy impact training would be preferentially scheduled in the Yellow and Green beach lanes where nest numbers are low. Water-borne activities that have no beach requirements or impacts would be preferentially scheduled in Lanes 8, 9, and 10. Even if a beach activity were to be scheduled in Lanes 8, 9, and/or 10, it would be expected to be an activity with a small footprint and low impact on nesting birds. Section 3.12.3.1.2 of the FEIS further discusses these mitigative effects of this scheduling efficiency. |

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| | | | Also, while not explicitly stated, physical fitness activities are typically planned for areas with minimal nesting: in the obstacle course on Yellow 2, on the sand road paralleling Highway 75, paralleling the ocean along the high tide line, and in designated crossing lanes between the sand road and the tide line. As stated in the EIS, these activities can typically work around nests. For these and other reasons discussed in Section 3.12.3.1.2 of the FEIS, impacts to nesting birds in Lanes 8, 9, and 10 are expected to be minimal. |
| 282. | San Diego Audubon Society | MITIGATION FOR LEAST TERNS AND SNOWY PLOVERS<br>The mitigation measures for the impacts of this project are defined in section 12.4.1: "Develop a site enhancement plan that includes establishing dunes on the windward edges of Delta North and South that would enhance this area for plovers, create a source of sand for the least tern nesting area, and establish a better visual barrier between SR-75 and the nesting colony."<br><br>It is not clear what is meant by "Develop a site enhancement plan" Does that mean that the enhancement would actually be built? How big? When would it be built? Would it be in place and functioning before Alternative 1 or 2 would be implemented? Would it be maintained in perpetuity, or just constructed? This sort of information about the scale and viability of the mitigation should have been a major element of the EIS.<br>We would appreciate habitat enhancements. But, is it anticipated that these measures would result in an improvement in productivity in terns and plovers that would offset the anticipated direct and indirect take that would result from Alternative 1 or 2? It appears very doubtful that it would. One of the purposes of the EIS is to identify the net impact of the project with the mitigation. This EIS does not identify the impact and it does not identify how much of that impact is offset by the mitigation. It fails to provide the fundamental elements of an EIS.<br><br>A better visual barrier between SR-75 and the nesting colony will also mean a better approach path for avian predators to approach the tern colony without being detected. We doubt that will improve the productivity of the colony. Thus it does not appear to have any value as mitigation.<br>Section 12.4.2 states: "Vehicle patrolling and LARC V operator training will not occur in Red, Blue, or Orange Beach Lanes." How many least terns of snowy plovers will this save? Will the terns and plovers that are saved by this measure survive the other activities that will occur in these lanes under Alternatives 1 and 2? It does not appear that they would. Again, the EIS fails to identify the impacts of this measure, which is one of its main purposes.<br><br>The two mitigation measures in the EIS may tend to reduce or offset the take a little, but they do not appear to minimize or to offset the impacts of the Project. If Alternatives 1 or 2 are adopted in spite of their inappropriate impacts, we urge that mitigation be provided that will actually offset the take that results from those actions. | The addition of sand is contemplated as a principal element of the site enhancement plan to make the historically designated nesting areas more attractive for nesting terns and more secluded from the road. Vegetation management of the dunes (removal of iceplant with some replacement by native species) will increase the carrying capacity for terns and plovers. Accounting will take place through monitoring of take and reproductive success. The Long Term Site Enhancement Plan which is part of the Proposed Action could increase the carrying capacity for terns by hundreds of nests. For snowy plovers, the long-term site enhancement plan is estimated to realistically mitigate for an estimated 34 nests annually. The FEIS quantitatively estimates the amount of benefit provided by Navy management above and beyond that required by past projects, and that can be considered avoidance, minimization, and offsetting measures related to training.<br><br>Besides setting aside real estate, the most important mitigation measure is probably predator control. The Navy has a number of predator management and control measures that it implements throughout the breeding season to minimize impacts of predators, including avian predators, ants, and mammals (see Section 3.12.1.5.3 of the FEIS for more detail). Predator control is considered by many species experts to be one of the most crucial management strategies for reproductive success (Foster 2006; USFWS 2006c). Without the Navy's predator control program, the SSTC nesting sites would likely |

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| | | | have substantial reproductive failure. This predator control program has allowed for and is expected to continue to promote over one thousand nests that are annually found on SSTC-N. |
| 283. | San Diego Audubon Society | The EIS does not indicated that any accounting will be done to identify how much of the environmental impact of the project is expected to be offset by the mitigation. How would a regulator or decision maker be able to identify how much environmental impact has occurred and how much has been offset by the mitigation over time? We urge that the EIS provide how such an ongoing net impact assessment will be accomplished to facilitate the adaptive management process that is mentioned.<br><br>If the project results in a substantial increase in a net take, or if the viability of the terns and plovers begins to diminish, will the project include additional specific mitigation measures to restore protection of the nesting at the three lanes or more to offset the loss? Though adaptive management is suggested, there are no specifics of what is meant by it for this project.<br><br>It appears that there are areas in the SSTC South area that could be used to mitigate for the impacts of this project that would be difficult and costly to use for training. We urge that the Final version of this document explore that possibility. | The Navy has proactively prepared for the expected take through site enhancement, management of lane usage, nest protection, monitoring, and decades of adaptive management. In response to this and other comments received, the Navy has revised the EIS analysis on the California least tern (Section 3.12.3.1) and the western snowy plover (Section 3.12.3.2) to provide a more in-depth analysis of impacts that training is expected to have on the species. Mitigation measures have been added to the Proposed Action. The benefits of current and proposed mitigation are also described and quantified as far as practicable. As discussed in the analysis, the benefits of mitigation are expected to outweigh potential adverse impacts of training. The Navy works each year on site-maintenance and monitoring, plus periodic site enhancement or management approaches to manage terns, and to increase attractiveness of Delta beaches. The discussion originally presented in the DEIS has been updated in the FEIS (Section 3.12.3.1) to explain the level of loss anticipated under the No Action Alternative compared to that under Alternative 1, estimated to be an increase of seven nests, on average, in a typical year for least terns. The difference in incidental take for snowy plover between the No Action Alternative and Alternative 1 is one nest, on average, in a typical year. The Navy will ensure that biological monitors look for and document the locations of least tern or snowy plover nests, eggs, and chicks prior to and after all military training exercises, to allow for the assessment of take associated with training activities.<br><br>The Navy believes it has already fully mitigated for training impacts. The Navy, in response to your and other comments, has attempted to analyze the beneficial impacts of proposed |

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| | | | mitigation. Some of the mitigation has impacts that are interconnected with many other factors, and can only be discussed qualitatively. Where possible, the Navy attempted to quantify the beneficial impacts of the proposed mitigation. The Navy has determined (see Sections 3.12.3.1 and 3.12.3.2 of the FEIS), that the proposed mitigation will well offset the anticipated take of listed bird species on SSTC associated with military training.<br><br>The Navy conducts frequent and routine monitoring of the nesting sites and regular dialogue with the USFWS on the status of listed birds nesting on SSTC. If changes in the population of nesting listed bird species occur on SSTC, the Navy and USFWS will work together to determine the reason for the change in population, and will reinitiate consultation if appropriate.<br><br>There are no areas on SSTC-S that are not used for training, except for the vernal pools and the area leased to Camp Surf. All of these areas will continue to be needed under all three Alternatives. |
| 284. | San Diego Audubon Society | IMPACTS ON DIVING BIRDS<br>We appreciate the analysis that was performed relating to the impacts of underwater detonations on diving birds and marine mammals. However, we have not had the resources to verify the data, rationale, or conclusions at this time. We also appreciate the plan to discourage diving birds from the exercise area to prevent injuries or death to them. | Your comment has been noted. |

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| 286. | San Diego Audubon Society | PROTECTION OF SENSITIVE PLANT SPECIES<br>We do not think that the protection of sensitive dune and upland species proposed by the EIS is adequate, but have not had the resources to comment specifically on them at this time. Volunteer from our chapter spend many hundreds of hours removing invasive vegetation to provide habitat for some of these sensitive plant species. It is disappointing to hear that there will be no protection for these sensitive species in this project. | Rare plant surveys for all plants identified in the EIS, and others, have been completed. The Navy has an invasive species control program that directly benefits sensitive plant species. The naturally disturbed dune environment and the plants adapted to it benefit from Navy invasive species control. Upland rare plants are locally relatively abundant, and benefit from annual invasive species control and monitoring. Some benefit occurs through restoration that primarily involves weed control. Avoidance and minimization measures are implemented at the Delta beaches for plants identified as rare by the California Native Plant Society as List 1B or higher. The Navy conducts annual surveys and treatment for invasive plants and, in recent years, has been expanding treatment of iceplant. The Navy conducts annual surveys for and treatment of invasive plants and, in the near future, will be expanding treatment of iceplant. A vegetation management plan is under development to support terns and plovers. Focused rare plant management includes *Phacelia stellaris*, *Dudleya variegata*, among other rare plants that are less abundant on Silver |

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| 287. | San Diego Audubon Society | IMPACTS ON VERNAL POOLS<br>Vernal pools are one of the most endangered habitat types in all of California. These pools house a vast array of life forms, including endangered species like the San Diego Fairy Shrimp. Trails running through the vernal pools will disturb the sensitive hydrology of the pools, even if they are only used during the dry season. Cysts can be crushed and damaged even in the dry season. There is no way to predict the damage that could be caused to the vernal pools by crossing through them, even limited to just the dry season. The complex ecology of vernal pools is easily disturbed. We urge that the vernal pools be fenced, and that crossing of vernal pools be prohibited.<br><br>Paragraph 3.11.1.1.1, Regulatory Framework, states that the Fish and Wildlife service may issue a Biological Opinion that will state measures that will avoid or minimize the take of any listed species. Table 3.11-3 acknowledges that Alternatives 1 and 2 could adversely impact individual fairy shrimp. The foot traffic will have direct and indirect impact on the vernal pools, even if the foot traffic through the pools is limited to dry seasons. The direct impact is that cysts will be damaged or destroyed by the foot traffic. This is addressed in the EIS. When people walk through an area that contains weedy species, the seeds of the weeds often attach themselves to the shoes, clothes, and equipment of the people. These seeds drop off as the people walk elsewhere, helping to disburse the weed seeds. The invasion of these weeds can have many negative impacts on the pools, including shadowing, increasing evaporation and transpiration rates, degrading the hardpan, etc. There is no way to minimize this impact. Foot traffic could also wear depressions in the containment mounds of the pools eventually changing the hydrology of the pools, preventing the pooling from occurring. Foot traffic could also change land contours separating a pool from its immediate watershed. The EIS does not address any of these significant impacts as it needs to. Clearly these impacts will progressively degrade the pools and will reduce the likelihood that fairy shrimp will be able to recover. | To the maximum extent consistent with training needs, off-road foot traffic will avoid the vernal pools occupied by San Diego fairy shrimp and their watersheds. Avoidance may be accomplished using markers, maps, global positioning coordinates, or any other means consistent with training needs. The Navy agrees that cysts will be crushed and damaged in the dry season. However, there are tens of thousands if not millions of cysts, and the take of some during training on foot is not expected to be a population-level effect. The low number of personnel walking in a dispersed manner in the training area is not a large effect, considering the percent of the training area occupied by the pools. The nature and level of expected take have been addressed in a BA, and the Navy has completed consultation with USFWS on this (Biological Opinion signed July 7, 2010).<br><br>The Navy believes that the potential impact is sufficiently low that it can be managed on site. The nature and level of expected take have been addressed in a Biological Opinion from the USFWS. No violation of the Endangered Species Act will occur because the Navy has requested and received USFWS approval for any impacts to fairy shrimp. |

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| | | Clearly, allowing foot traffic through the vernal pools will not "minimize" (as stated several times in the EIS, including Table 3.11-3) the take of fairy shrimp in any sense and is a violation of the Endangered Species Act. Limiting the access to foot traffic in dry weather may slightly reduce it, but that is very far from minimizing it in either a legal or practical sense. Pinocchio got a very long nose when he said things like that.<br><br>Unfortunately the EIS does not address the conservation of the pools that are not occupied by fairy shrimp. The objective of the Endangered Species Act is Recovery, not just hanging on, or not facilitating the incremental decline of the species. For recovery to occur, a reasonable amount of unoccupied habitat must be protected to accommodate more populations. We urge that a significant portion of unoccupied and restorable pools be protected as well as occupied pools.<br><br>The survey for fairy shrimp, on which this document is based, was conducted in 2001 and 2003. A more recent survey is required to know how many pools are currently occupied. We urge that decisions be based on a more timely survey.<br><br>We strongly urge that the Project require that all occupied, and all unoccupied pools with a reasonable chance of being restored for future occupation, be fully fenced and that regulations be implemented that forbid entry at any time of the year except for needed maintenance or emergencies. We also urge that the watershed of these pools also be protected so the hydrology of these pools and their necessary watersheds will be viable.<br><br>If the Project intends to use vernal pools for foot traffic in spite of the potentially serious impacts, we urge that a multi-year experiment be conducted to assess the impacts on a single test pool, and that all other pools be fully fenced and protected until the potential impacts are fully understood and disclosed. | The Navy will avoid the occupied vernal pools and their watersheds adjacent to the road at SSTC-S Inland (i.e., pools 1 through 7 marked with flexi-stakes) year-round, to the maximum extent consistent with training needs. Foot traffic when the pools are dry consists primarily of small groups. As presented in Section 3.11 of the FEIS, trail forming and soil compaction are unlikely, resulting in no impact to population viability. Additionally, the Navy has completed consultation with the USFWS, and has received a signed Biological Opinion which concludes that proposed training activities will not jeopardize the continued existence of San Diego fairy shrimp.<br><br>As part of the conditions of the Biological Opinion, the Navy will be completing a Vernal Pool Management and Monitoring Plan to help determine whether the impacts identified in the EIS remain at the low levels expected. The Plan will include a focused invasive plant inspection survey in the pools and their watersheds; plant, topographic, hydrological, and water quality surveys (including salinity); and protocol fairy shrimp surveys. In addition, the Navy will be determining the baseline distribution and abundance of San Diego fairy shrimp and condition of the vernal pool habitat prior to initiating training activities in or around the vernal pools at SSTC-S Inland. If impacts are more substantial than the low levels anticipated or if impacts could lead to the extirpation of fairy shrimp from any individual pool, then the Navy will reinitiate consultation with the USFWS. |

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| 288. | San Diego Audubon Society | WHEN THE CURRENT DEMAND FOR BEACH TRAINING RELAXES<br>The EIS addresses the need for additional training capability because of the additional deployments to war zones. It does not address returning to the current protection of nesting birds in the three lanes when the need for training is relaxed. If Alternative 1 is adopted, will it be a temporary measure? If Alternative 1 or 2 are implemented, we urge that the EIS contain a commitment that it will revert to the No Project configuration when the need for additional training is reduced in the future. | The EIS identifies alternatives, including the Navy's preferred alternative, and the decision-maker selects one of those alternatives in the ROD. The purpose of the Proposed Action is to enable the Navy to perform realistic training in a variety of environments to achieve full operational readiness. With the mitigation measures presented in the EIS (and brought forward from the USFWS Biological Opinion) and maintenance of preferential training areas outside of nesting areas, the activities listed under Alternative 1 should not need to be decreased in the future if the training regime shifts.<br><br>The Navy is proposing to amend its current management of nesting birds for several reasons. Most of those reasons are unrelated to the additional deployments to war zones (Sections 1.5.1.1, 1.5.1.2, and 1.5.1.3). The Navy is not anticipating that the need for training is going to be relaxed. The Navy anticipates that the need for training will increase after the current conflicts are over (see Section 2.2.1). Also, the needs for better quality training and more flexible usage of the training range are not dictated by wartime situations. The Navy needs to maintain the highest level of force readiness at all times to prepare for combat, and needs high quality training to ensure this readiness.<br><br>However, the Navy does have several measures that will further reduce impacts to nesting birds if training were to be reduced in the future. As discussed above, and in Section 3.12.1.5.3 of the FEIS, beach scheduling procedures bias activities with heavier beach use towards beach lanes with fewer nests, when it does not impact the realism of training or training needs. This means that heavy impact training would be preferentially scheduled in the Yellow and Green beach lanes where nest numbers are low. If training lanes are available, there is a reduced need to enter into Lanes 8, 9, and 10. Only a few beach activities need to use Lanes 8, 9, or 10, and are activities with small footprints and low impact on nesting birds. Section 3.12.3.1.2 further discusses the mitigative effects of this scheduling efficiency. |

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| 289. | San Diego Audubon Society | CONCLUSION<br>This document does not satisfy the letter or the intent of NEPA. We strongly urge that the "No Project" Alternative be adopted. However, it appears that a more thoughtful alternative, with real mitigation measures, could be put together that would allow an increase in the training capacity of the Silver Strand while protecting or even enhancing its extremely valuable natural resources. We encourage the Navy to move in that direction in a future Draft of the EIS.<br><br>The Navy has had laudable success in its well conceived and well managed mitigation projects for past impacts to terns and plovers on Silver Stand. It is regrettable that this project will seek to significantly dismantle some of that success.<br><br>If the Navy decides to move ahead with the current alternatives, we strongly urge that the next Draft quantify what impacts of the project will and will not be offset by the mitigation proposed. We urge that the Navy then identify mitigation that will fully offset the deficit.<br><br>We strongly urge that the Species Viability Model used in this Draft be substantially updated or not used. It is not the least bit certain that the current population of least terns is viable in view of our environmental and climate uncertainties. That model clearly does not provide credible justification to the assertion the species will do just fine with a drop of a couple thousand birds. | As discussed in other responses to your comments, thoughtful alternatives have been presented in this EIS. As described in Section 2 of the FEIS, the Navy considered, but rejected, alternatives that included moving exercises to other locations. Such alternatives fail to meet the purpose of and need for the Proposed Action. Additionally, alternatives were eliminated that investigated the distribution of military activities to different locations within SSTC.<br><br>In response to this and other comments received, the Navy has revised the EIS analysis on the California least tern (Section 3.12.3.1) and the western snowy plover (Section 3.12.3.2) to provide a more in-depth analysis of impacts that training is expected to have on the species. Additional analysis has been provided on the indirect and direct impacts of current and proposed military training, to include both an average anticipated impact as well as a high-intensity anticipated impact. New mitigation measures have been added to the Proposed Action. The benefits of current and proposed mitigation are also described and quantified, to the extent practicable. As discussed in the analysis, the benefits of mitigation are expected to outweigh potential adverse impacts of training. The Navy has consulted with the USFWS, and received a Biological Opinion (July 7, 2010) for take of the listed species associated with military training. An update of the Species Viability Model is needed; however, it is currently the best available science. The Navy sees its responsibility as contributing to recovery. The Navy works each year on site-maintenance and monitoring, plus periodic site enhancement or management approaches to manage terns, and to increase attractiveness of Delta beaches. |

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| 290. | San Diego Audubon Society | The San Diego Audubon Society is very concerned with the proposed project. We appreciate the current efforts of the Navy to protect and enhance the safe nesting of California Least Terns and Western Snowy Plovers on the Silver Strand. Section 5.11.1. is a very interesting history of Navy environmental responsibility and leadership. We also appreciate the expanded training needs for the Navy because of our Nation's current high level of military activity. However, we do not think that the plan needs to be more protective than the current Alternative 1 or 2. Therefore we support the No Project alternative unless Alternate 1 can be improved substantially. We strongly urge that Alternative 2 not be selected because of its large and irresponsible impact on least terns and snowy plovers.<br>IMPACTS ON LEAST TERNS AND SNOWY PLOVERS<br>The population of Least Terns has risen substantially over the last 15 years, as the EIS shows. But, the reproduction of Least Terns has generally been declining over the last decade as the EIS also shows. This suggests that the species is not doing nearly as well as it looks. It is also thought that the average age of the birds is increasing, which could cause less reproductive success. This is clearly not a good time to increase the take of the species, particularly when that take is avoidable. We will be more specific in the following subheadings. | Local declines in reproductivity are disproportionately related to predation by gull-billed terns. The discussion in the EIS has been amended to explain the level of loss anticipated under the No Action Alternative compared to Alternative 1, estimated to be an increase of seven nests, on average, in a typical year. The difference in incidental take for the snowy plover between the No Action Alternative and Alternative 1 is one nest, on average, in a typical year. The Navy will implement a mitigation measure to schedule training in areas where less nesting occurs when possible and still meet training needs. In addition, the Navy will schedule training activities that could be conducted on the hardpack portion of the beach during low tides, when it is consistent with training needs. The Navy will develop a marking strategy to delineate least tern and snowy plover nesting areas that does not encumber training activities. Such a marking strategy may entail signage affixed to existing beach lane sign posts and a limited number of additional markers, as determined appropriate by Navy staff.<br>Finally, the Navy's Proposed Action includes: ongoing nesting site preparation at the Delta Beaches; predator management; population monitoring; a Long Term Habitat Enhancement Plan; and measures to eliminate unauthorized recreational trespass, which are all conservation measures that support the recovery of the least tern. The Navy expects that implementation of these conservation measures will maintain the suitability of least tern habitat within the action area over the long term. The Navy's actions will increase the capacity of oceanside beaches and the Delta beaches to accommodate least terns and snowy plovers. Historical takes between 2005 and 2009 averaged 38 nests being directly impacted annually, potentially due to military training on SSTC-N Beach Lanes 1-7 (see Section 3.12.3.1). Modeling for the highly intense training scenario of the No Action Alternative conservatively estimated that 88 California least tern nests would be directly impacted annually (see Section 3.12.3.1 for modeling methodology). All birds present would be potentially subject to disturbance. |

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| | | | Nesting activity has increased despite the average historical annual loss of 38 nests (Figure 3.12-9), indicating a capability of the species to not only continue to persist on SSTC, but also to increase, with training occurring in the nesting beaches during the nesting season. Much of this has to do with the Navy's mitigation measures and management practices discussed below. |
| 291. | San Diego Audubon Society | CUMULATIVE IMPACTS NOT ADDRESSED, LEAST TERNS<br>The EIS provided a long list of likely activities for which the cumulative impacts have been addressed. We are concerned that several very relevant activities were not addressed that, when combined with Alternative 1 or 2 could help put the recovery, and perhaps even the survival of the species in jeopardy.<br>The U.S. Fish and Wildlife Service has proposed downlisting the least terns from Endangered to Threatened. This would reduce the priority for funds, for priority for other resources such as locations for new nesting areas, negotiating site management agreements, predator management, protection and enhancement of the fish needed for foraging, research, monitoring, planning, analysis, site maintenance, etc. This reduction in resources and priorities will take a toll on the species, in both predictable and unpredictable ways.<br>Global Climate Change appears to be making the quantity and timing of the supply of small fish for least tern consumption more variable and more uncertain. This affects the laying of eggs and the likelihood that chicks will survive. Changes are happening very quickly which could leave the entire population more vulnerable.<br>The impacts of Gull-bill terns on tern reproductive have been significant and appear to be increasing. There appears to be no real progress toward identifying how to manage the two species to assure the recovery of least terns. This lack of resolution is likely to result in a large and unmanaged take of least terns for at least several years while regulations are developed, reviewed, and finally implemented.<br>The Recovery Plan for least terns is almost three decades old and is based on outdated information. As a result, there is no effective comprehensive and broadly accepted plan for the recovery of least terns. This deficiency in planning and management means that there is no valid way to conclude that the additional take proposed by Alternatives 1 or 2 will not help put the species in jeopardy. We urge that the EIS discuss each of the additional cumulative impacts mentioned above and incorporate their effects into a realistic Species Viability Analysis. | Downlisting the least tern does not affect Navy funding priorities in its INRMPs - Endangered and Threatened species are classified with the same funding priority. Navy is contributing to research on climate change and least tern foraging habits in San Diego Bay. Gull-billed tern predation studies are also underway by the Navy and other funders (including USFWS).<br><br>The Navy agrees that the USFWS Recovery Plan is outdated, and concerns about an inadequate PVA population viability assessment are acknowledged. A species viability analysis is under consideration for funding.<br><br>Gull-billed tern predation studies are also underway by the Navy and other funders (including USFWS), and the Navy has requested approval from USFWS to relocate Gull-billed terns, without success. A species viability analysis is under consideration for funding. The USFWS has not officially proposed the California least tern for downlisting. If and when it does, the proposal will be published in the Fed Register and will be open for public comment before a final decision is made.<br><br>The Navy is working closely with the USFWS to assist it in addressing gull-billed tern predation and impacts to western snowy plover and California least tern. The Navy has submitted an application for a depredation permit to the USFWS Division of Migratory Bird Management annually since 2005, and has continued to document the impacts of this |

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| | | | species. The Navy is supporting a radio-telemetry study by San Diego State University and USFWS during the 2010 nesting season. This study will research movements and diet of gull-billed terns around San Diego Bay. |

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| 292. | San Diego Audubon Society | SPECIES VIABILITY ANALYSIS, LEAST TERNS<br>The Species Viability Analysis is based on reproduction rates measured in 1981 to 1984, page 3.12-21. At this time the productivity was 0.62 fledgling per nest in good years and 0.27 for years dominated by El Nino/Southern Oscillation (ENSO). The ENSO influence was expected about one out of seven years.<br>According to a figure in the handout from the public presentation, in the last 8, the good years have had productivity around 0.15 for the good years and 0.05 for the bad ones. It appears that we have had 8 bad years in a row vs. the one bad year anticipated in the Species Viability Analysis. As mentioned above the analysis assumes one ENSO year for every 7 normal years. However, some climate models now suggest that with global warming the average may become more like the ENSO state.<br>The model also does not address other trends that could increase the risk to the food supply for least tern recovery such ocean warming, reduced oxygen levels in the ocean, and ocean acidification. Each of these issues suggests that the Species Viability Model is probably wildly optimistic. We urge that this EIS not conclude that a lower population of least terns will not jeopardize the recovery of the species unless it can be based on current and relevant data and the best analysis of future trends. Such an analysis should also incorporate the effects of the cumulative impacts listed previously in this letter. Any model used should include the uncertainty range of the input information, the uncertainties of the assumptions the model is based on, how the uncertainties propagate through the model, and the uncertainty of the results. A model that produces a number without clear quantification of the uncertainty of that number will probably be more misleading than useful.<br>The species viability analysis only appears to address keeping the species from declining to extinction. The purpose of the Endangered Species Act is recovery. This analysis needs to be redirected to identify a population and population growth rate that will lead to reliable recovery of each species in a reasonable period of time. | The USFWS is responsible for such a viability assessment, while the Navy is responsible for management and contributions to least tern recovery. The take estimates are a worst-case scenario; the birds actually tend to redistribute to safer areas. The Navy will be increasing the carrying capacity for terns and plovers through its Long Term Site Enhancement Plan.<br><br>The Navy is proposing to develop and implement a long-term site enhancement plan for SSTC-N, including both the oceanside and the bayside beaches. The long-term site enhancement plan is estimated to more realistically mitigate for an estimated 360 nests annually. This site enhancement plan will work to control and, where possible, remove invasive non-native vegetation on the beaches and, if appropriate, replace it with native vegetation. SSTC-N oceanside training lanes contain over 16 acres of overgrown invasive vegetation (Table 3.12-13), mostly towards the back one-third of the beach. While this additional depth of beach is needed for several reasons, including providing separation from the highway, most training has a minimal footprint on this area. Training is most heavily concentrated in areas closest to the tide line. Removal or replacement of invasive overgrown vegetation in the back beach area will open these safer areas up to nesting activity. |

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| 293. | San Diego Audubon Society | IMPACT OF NOISE AND DISTURBANCE ON LEAST TERNS AND SNOWY PLOVERS<br>We were pleased to see the substantial analysis of the average and peak noise resulting from the project in Section 3.6, ACOUSTIC ENVIRONMENT. But we were extremely disappointed to discover that the noise analysis was only related to "sensitive receptors" of the human kind. The EIS provides no analysis to determine if the increases in average noise or peak noise from the increases in gunfire, flares, and detonation would result in a take of least terns or snowy plovers. This take could result from either least terns or snowy plovers abandoning eggs or chicks because of the additional noise, either on the ocean side or the bay side of the Silver Strand.<br>We strongly urge that the EIS include analysis of the indirect take of chicks and eggs that will result from permanent nest abandonment that is likely to result from the increase in noise, both average and peak. We also urge that the EIS include analysis of the indirect take of chicks and eggs that is likely to result 3 from temporary abandonment that would make the eggs and chicks more vulnerable to death from heat, cold, predators, and starvation. | The EIS does analyze noise and its effect on wildlife (see FEIS Sections 3.11.2 Terrestrial Biological Resources Environmental Consequences; 3.12.2.2.1 Air Activities; 3.12.2.2.2 Pyrotechnics, Simunitions, and Blanks; and 3.12.2.2.4 Amphibious and Beach Activities, and parallel sections under the other Alternatives). Existing noise levels do not appear to cause nest abandonment, and projected received noise levels are not very different considering the noise source location and the location of nesting avian species. |
| 294. | San Diego Audubon Society | ALTERNATIVES<br>The limited range of alternatives that are presented do not provide a good starting point for a productive process to resolve the project's operational and environmental problems. We urge that the EIS alternatives be expanded to lead to a reasonable solution to the Navy's training problem. Many of the missions that are proposed can be accomplished with virtually no beach access. We urge that the uses of lanes blue 2, orange 1, and orange 2 be limited to those missions. Needed access for them could be by boat vs. land. If emergency access is occasionally needed over the beach in case of an accident, that could be considered valid unavoidable "incidental take". Such an alternative should be developed and analyzed.<br>We also urge that an alternative be analyzed that allows the lanes at Camp Pendleton to be used to relieve some of the scheduling pressure on the Silver Strand Beach Lanes without taking out least tern and snowy plover eggs and chicks. | As stated in Section 2.3.5 of the FEIS, the three training lanes are only used if one of two criteria are met. The Navy preferentially schedules activities for other beach training lanes unless all training lanes are being used, or there are attributes of those lanes that make training there more suitable.<br><br>The Navy preferentially schedules water-only training activities in Lanes 8, 9, and 10 because of the distance those lanes are located from NAB. As stated in Section 2.3.5 of the FEIS and the criterion that has been established for the lanes, the Navy does not anticipate heavy use of Lanes 8, 9, and 10.<br><br>As described in Section 2.1.3 of the EIS, the Navy considered, but rejected, alternatives that included moving these exercises to other locations. Such alternatives fail to meet the purpose of |

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| | | | and need for the Proposed Action. |
| 295. | San Diego Audubon Society | MITIGATION FOR LEAST TERNS AND SNOWY PLOVERS<br>The mitigation measures for the impacts of this project are defined in section 12.4.1: "Develop a site enhancement plan that includes establishing dunes on the windward edges of Delta North and South that would enhance this area for plovers, create a source of sand for the least tern nesting area, and establish a better visual barrier between SR-75 and the nesting colony."<br>It is not clear what is meant by "Develop a site enhancement plan…" Does that mean that the enhancement would actually be built? How big? When would it be built? Would it be in place and functioning before Alternative 1 or 2 would be implemented? Would it be maintained in perpetuity, or just constructed? This sort of information should have been a major element of the EIS.<br>We would appreciate habitat enhancements. But, is it anticipated that these measures would result in an improvement in productivity in terns and plovers that would offset the anticipated direct and indirect take that would result from Alternative 1 or 2? It appears very doubtful that it would. But one of the purposes of the EIS is to identify the net impact of the project with the mitigation. It does not. A better visual barrier between SR-75 and the nesting colony will also mean a better approach path for avian predators to approach the tern colony without being detected. We strongly doubt that will improve the productivity of the colony.<br>Section 12.4.2 states: "Vehicle patrolling and LARC V operator training will not occur in Red, Blue,<br>or Orange Beach Lanes." How many least terns of snowy plovers will this save? Will the terns and plovers that are saved by this measure survive the other activities that will occur in these lanes under Alternatives 1 and 2? It does not appear that it would. Again, the EIS fails to discuss or answer this question, which is one of its main purposes.<br>The two mitigation measures in the EIS may tend to reduce or offset the take to some extent, but they do not appear to minimize or to offset the impacts of the Project. If Alternatives 1 or 2 are adopted in spite of their inappropriate impacts, we urge that mitigation be provided that will actually offset the take that results from those actions.<br>The EIS does not indicated that any accounting will be done to identify how much of the environmental impact of the project is expected to be offset by the mitigation. How would a regulator or decision maker be able to identify how much environmental impact has occurred and how much has been offset by the mitigation over time? We urge that the EIS provide how such an ongoing net impact assessment will be accomplished to facilitate the adaptive management process that is mentioned. If the project results in a substantial increase in a net take, or if the viability of the terns and plovers begins to diminish, will the project include additional specific mitigation measures to restore protection of the nesting at the three lanes or more to offset the loss? Though adaptive management is suggested, there are no specifics of it.<br>It appears that there are areas in the SSTC South area that could be used to mitigate for the impacts of this project that would be difficult and costly to use for training. We urge that the Final version of this document explore that possibility. | The addition of sand is contemplated as a principal element of the site enhancement plan to make the historically designated nesting areas more attractive for nesting terns and more secluded from the road. Accounting will take place through monitoring of take and reproductive success. In addition, the Long Term Site Enhancement Plan, which is part of the Proposed Action, could increase the carrying capacity for terns by hundreds of nests. For snowy plovers, the long-term site enhancement plan is estimated to realistically mitigate for an estimated 34 nests annually.<br><br>The FEIS quantitatively estimates the amount of benefit provided by Navy management above and beyond that required by past projects, and that can be considered avoidance, minimization, and offsetting measures related to training. Besides setting aside real estate, the most important mitigation measure is probably predator control. The Navy has a number of predator management and control measures that it implements throughout the breeding season to minimize impacts from predators, including avian predators, ants, and mammals (see Section 3.12.1.5.3 for more detail). In 2009, 512 individual predators were managed (either lethally removed or freed away from the nesting sites). During that same year, there were 32 documented predation incidents on California least terns and western snowy plovers other than by gulled-billed terns. Predator control has beneficial impacts beyond protecting individual eggs or chicks from loss to predation. The presence of predators can cause disturbance, flushing, or even nest abandonment, potentially leading to overall habitat degradation or loss. As discussed in Section 3.12.1.3.1 of the FEIS, because California least terns are colony breeders, they are particularly susceptible to predation and disturbance. Predator control is considered by many species experts to be one of the most crucial management strategies for reproductive success (Foster 2006; USFWS |

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| | | | 2006c). On Camp Pendleton, a rough tripling of nesting California least tern adult pairs from 1995 to 2001 was considered to be associated with the active removal of predators (Shwiff et al. 2004). Without the Navy's predator control program, the SSTC nesting sites would likely have substantial reproductive failure. This predator control program has allowed for and is expected to continue to promote over one thousand nests that are annually found on SSTC-N.<br><br>All of SSTC-S is either used to support training or set aside for conservation of the species, or used by Camp Surf. There is no location for additional mitigation. |
| 296. | San Diego Audubon Society | IMPACTS ON DIVING BIRDS<br>We appreciate the analysis that was performed relating to the impacts of underwater detonations on diving birds and marine mammals. However, we have not had the resources to verify the data, rationale, or conclusions at this time. We also appreciate the plan to discourage diving birds from the exercise area to prevent injuries or death to them.\ | As indicated in Section 3.12 of the FEIS and in the signed Biological Opinion (July 7, 2010), the Navy has a mitigation measure to look for diving birds and marine mammals prior to detonation and to halt the detonations until the animals have voluntarily left the area. |
| 297. | San Diego Audubon Society | PROTECTION OF SENSITIVE PLANT SPECIES<br>We do not think that the protection of sensitive dune and upland species proposed by the EIS is adequate, but have not had the resources to comment specifically on it at this time. | The Navy has an invasive species control program that directly benefits sensitive plant species. Upland rare plants are locally relatively abundant, and benefit from annual invasive species control and monitoring. Some benefit occurs through restoration that primarily involves weed control. Avoidance and minimization measures are implemented at the Delta beaches for plants identified as rare by the California Native Plant Society as List 1B or higher. The Navy conducts annual surveys for and treatment of invasive plants and, in recent years, has been expanding treatment of iceplant. A vegetation management plan under development to support terns and plovers also benefits sensitive plant species. Focused rare plant management includes *Phacelia stellaris, Dudleya variegata*, among other rare plants that are less abundant on Silver Strand. |

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| 298. | San Diego Audubon Society | IMPACTS ON VERNAL POOLS<br>Vernal pools are one of the most endangered habitat types in all of California. These pools house a vast array of life forms, including endangered species like the San Diego Fairy Shrimp. Trails running through the vernal pools will disturb the sensitive hydrology of the pools, even if they are only used during the dry season. Cysts can be crushed and damaged even in the dry season. There is no way to predict the damage that could be caused to the vernal pools by crossing through them, even limited to just the dry season. The complex ecology of vernal pools is easily disturbed. We urge that the vernal pools be fenced, and that crossing of vernal pools be prohibited.<br>Paragraph 3.11.1.1.1, Regulatory Framework, states that the Fish and Wildlife service may issue a Biological Opinion that will state measures that will avoid or minimize the take of any listed species. Table 3.11-3 acknowledges that Alternatives 1 and 2 could adversely impact individual fairy shrimp. The foot traffic will have direct and indirect impact on the vernal pools, even if the foot traffic through the pools is limited to dry seasons. The direct impact is that cysts will be damaged or destroyed by the foot traffic. This is addressed in the EIS. When people walk through an area that contains weedy species, the seeds of the weeds often attach themselves to the shoes, clothes, and equipment of the people. These seeds drop off as the people walk elsewhere, helping to disburse the weed seeds. The invasion of these weeds can have many negative impacts on the pools, including shadowing, increasing evaporation and transpiration rates, degrading the hardpan, etc. There is no way to minimize this impact. Foot traffic could also wear depressions in the containment mounds of the pools eventually changing the hydrology of the pools, preventing the pooling to occur. Foot traffic could also change land contours separating a pool from its immediate watershed. The EIS does not address any of these important but significant impacts as it needs to. Clearly these impacts will progressively degrade the pools and put the current fairy shrimp or the possibility of recovery of the species in jeopardy.<br>Clearly, allowing foot traffic through the vernal pools will not "minimize" (as stated several times in the EIS, including Table 3.11-3) the take of fairy shrimp in any sense and is a violation of the Endangered Species Act. Limiting the access to foot traffic in dry weather may slightly reduce it, but that is very far from minimizing it in either a legal or practical sense. Pinocchio got a very long nose when he said things like that.<br>Unfortunately the EIS does not address the conservation of the pools that are not occupied by fairy shrimp. The objective of the Endangered Species Act is Recovery, not just hanging on, or not facilitating incremental decline of the species. For recovery to occur, a reasonable amount of unoccupied habitat must be protected to accommodate more populations. We urge that a significant portion of unoccupied and restorable pools be protected as well as occupied pools.<br>The survey for fairy shrimp, on which this document is based, was conducted in 2001 and 2003. A more recent survey is required to know how many pools are currently occupied. We urge that decisions be based on a more timely survey.<br>We strongly urge that the Project require that all occupied, and all unoccupied pools with a reasonable chance of being occupied, be fully fenced and the regulations be implemented that forbid entry at any time of the year except for needed maintenance or emergencies. We also urge | Foot traffic entering the pool, as described in the EIS, does not mean troops of people walking back and forth over the pools. The nature of these training activities is dispersed. Each event is more likely to be one traverse over one pool, with a different path each time. The size of these pools varies, but they are large relative to the foot traffic, covering 3.2 acres. While harm to cysts is expected and analyzed, the order of magnitude is expected to be a few cysts, compared to an estimated population of tens of thousands if not millions of cysts in these pools.<br><br>The Navy will avoid the occupied vernal pools and their watersheds adjacent to the road at SSTC-S Inland (i.e., pools 1 through 7 marked with flexi-stakes) year-round, to the maximum extent consistent with training needs. Foot traffic when the pools are dry consists primarily of small groups. As presented in Section 3.11 of the FEIS, trail forming and soil compaction are unlikely, resulting in no impact to population viability. Additionally, the Navy has completed consultation with the USFWS, and has received a signed Biological Opinion which concludes that proposed training activities will not jeopardize the continued existence of San Diego fairy shrimp.<br><br>As part of the conditions of the Biological Opinion, the Navy will be completing a Vernal Pool Management and Monitoring Plan to help determine whether the impacts identified in the EIS remain at the low levels expected. The Plan will include a focused invasive plant inspection survey in the pools and their watersheds; plant, topographic, hydrological, and water quality surveys (including salinity); and protocol fairy shrimp surveys. In addition, the Navy will be determining the baseline distribution and abundance of San Diego fairy shrimp and the condition of the vernal pool habitat prior to initiating training activities in or around the vernal pools at SSTC-S Inland. If impacts are more substantial than the low levels anticipated or if impacts could lead to *the extirpation of fairy shrimp from* |

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| | | that the watershed of these pools also be protected so the hydrology of these pools and their necessary watersheds will be viable.<br>If the Project intends to use vernal pools for foot traffic in spite of the potentially serious impacts, we urge that a multi-year experiment be conducted to assess the impacts on a single test pool, and that all other pools be fully fenced and protected until the potential impacts are fully understood and disclosed. | *any individual pool, the*n the Navy will reinitiate consultation with the USFWS.<br><br>The Proposed Action will not all occur immediately, but slowly scale up over time, and only after the baseline condition of the vernal pools has been established, and Vernal Pool Management and Monitoring Plan has been developed and approved by the USFWS. This deliberate process will allow the Navy to evaluate the potential impacts and to take corrective action, as necessary. |
| 299. | San Diego Audubon Society | WHEN THE CURRENT DEMAND FOR BEACH TRAINING RELAXES<br>The EIS addresses the need for additional training capability because of the additional deployments to war zones. It does not address returning to the current protection of nesting birds in the three lanes when the need for training is relaxed. If Alternative 1 is adopted, will it be a temporary measure? If Alternative 1 or 2 are implemented, we urge that the EIS contain a commitment that returning to the No Project configuration when the need for additional training is reduced in the future.<br>CONCLUSION<br>As it stands we strongly urge that the "No Project" Alternative be adopted. However, it appears that a more thoughtful alternative, with real mitigation measures, could be put together that would allow an increase in the training capacity of the Silver Strand while protecting or even enhancing its extremely valuable natural resources. We encourage the Navy to move in that direction in a future Draft of the EIS. If the Navy decides to move ahead with the current alternatives, we strongly urge that the next Draft quantify what impacts of the project will and what will not be offset by the mitigation proposed. And we strongly urge that the Species Viability Model used in this Draft be substantially updated or not used. It is not certain that the current population of least terns is viable in view of our environmental and climate uncertainties. That model clearly does not provide a credible justification to think the species will do just fine with a drop of a couple thousand birds. | The EIS identifies alternatives, including the Navy's preferred alternative, and the decision-maker selects one of those alternatives in the ROD. With the mitigation measures presented in the EIS (and brought forward from the Biological Opinion and USFWS consultation), and maintenance of preferential training areas outside of nesting areas, the activities listed under Alternative 1 should not need to be decreased in the future if the training regime shifts.<br><br>The Navy is proposing to amend its current management of nesting birds for several reasons. Most of those reasons are unrelated to the additional deployments to war zones (Sections 1.5.1.1, 1.5.1.2, and 1.5.1.3). The Navy is not anticipating that the need for training is going to be relaxed. The Navy anticipates that the need for training will increase after the current conflicts are over (see Section 2.2.1). Also, the need for better quality training and more flexible usage of the training range is not dictated by wartime situations. The Navy needs to maintain the highest level of force readiness at all times to prepare for combat, and needs high quality training to ensure this readiness. The Long Term Site Enhancement Plan, which is part of the Proposed Action, could increase the carrying capacity for terns by hundreds of nests. For snowy plovers, the long-term site enhancement plan is estimated to realistically mitigate for an estimated 34 nests annually. |

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| | | | The USFWS is responsible for species viability assessment, while the Navy is responsible for management and contributions to least tern recovery. The FEIS quantitatively estimates the amount of benefit provided by Navy management above and beyond that required by past projects, and that can be considered avoidance, minimization, and offsetting measures related to training. Besides setting aside real estate, the most important mitigation measure is probably predator control. The Navy has a number of predator management and control measures that it implements throughout the breeding season to minimize impacts from predators, including avian predators, ants, and mammals (see Section 3.12.1.5.3 of the Feiffer more detail). Predator control is considered by many species experts to be one of the most crucial management strategies for reproductive success (Foster 2006; USFWS 2006c). Without the Navy's predator control program, the SSTC nesting sites would likely have substantial reproductive failure. This predator control program has allowed for and is expected to continue to promote over one thousand nests that are annually found on SSTC-N.<br><br>As discussed in Section 2.1.3.3 of the FEIS, reductions in training from current levels at SSTC would not support the Navy's ability to meet training requirements consistent with the Fleet Readiness Training Plan (FRTP) and, as discussed in Section 1.5 of the EIS, the purpose of and need for the Proposed Action. |

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| 300. | San Diego Bay Council | Despite the voluminous Draft Environmental Impact Statement, the Navy has not taken a hard look at the direct, indirect, and cumulative impacts this increased training will have on the community and the environment. The heart of the National Environmental Policy Act is for the Navy to fully analyze and weigh the consequences of each of its possible project alternatives, before selecting one. As part of this process, the Navy must inform members of the public of the burdens the Navy is expecting it and the environment it uses and enjoys" to bear as a result of the project, before the project is approved and an alternative selected. Here, the Navy's conclusory "analysis" and lack of meaningful alternatives makes NEPA nothing more than a meaningless exercise and deprives the public of the important information it is entitled to under the law.<br><br>While the San Diego Bay Council has a multitude of serious concerns about the Navy's proposed training increased activities and frequencies, this letter focuses on only three of our main concerns. We appreciate the extension the Navy granted so that we could submit these comments, but even with the extension, we were unable to delve into all our concerns in detail. We reserve the right to rely on other comments submitted during the public comment process, and we fully adopt here all comments submitted by the San Diego Audubon Society | As described in Section 2 of the FEIS, the Navy considered, but rejected, alternatives that included moving exercises to other locations. Such alternatives fail to meet the purpose of and need for the Proposed Action. Additionally, alternatives were eliminated that investigated the distribution of military activities to different locations within SSTC. Only those analyses that remained were selected for analysis. |
| 301. | San Diego Bay Council | I. The Draft EIS Fails to Analyze Anticipated Water Quality Impacts From Increased Smoke Grenades, Flares, and Surface and Underwater Detonations.<br><br>The Navy's proposed ramp-up in training at the Silver Strand Training Complex involves a significant increase in the amount of hazardous ordinance the Navy will be using. For example, the Navy plans to increase the use of smoke grenades and flares from 2,990 pounds to 4,410 pounds. See SSTC DEIS at 3.4-13. The smoke grenades and flares may contain aluminum, magnesium, zinc, strontium, barium, cadmium, nickel, and perchlorates. See SSTC DEIS at 3.4-11. The Draft EIS states that these hazardous pollutants will not cause any problems because "most of them are present in small amounts or low concentrations." See SSTC DEIS at 3.4-11. The Draft EIS summarily concluded that the "low concentrations of leachable metals" in the No Action Alternatives do not rise to the level of hazardous materials. See SSTC DEIS at 3.4-11.<br><br>The Draft EIS then deferred to the "Hazardous Waste" analysis in its water quality impacts analysis. See SSTC DEIS at 3.5-21. Specifically, the Draft EIS states that the "Hazardous Waste" analysis "concluded that only trace amounts of these residues are deposited on the ranges, and they are not expected to affect surrounding biological or physical resources." See SSTC DEIS at 3.5-21. But nowhere does the Navy actually analyze the impact of nearly doubling the amount of pollutants it plans to deposit during training. Instead, the Draft EIS characterizes the pollutants as "trace" amounts and summarily dismisses their potential | While the SSTC FEIS discusses a cumulative increase in the quantity of smoke grenades and flares used in training events, the increase is quantified in terms of individual grenades and flares, and not necessarily the small quantities of potentially hazardous substances. There will be little use of smoke grenades and flares directly in or over water. Use per training event in which smoke and flares apply is also small (2-11 items). In addition, this use is spread throughout the year and at various locations within SSTC, so there hot spots on the ranges.<br><br>Smoke grenade filler has approximately 11 ounces of a colored smoke mixture (white, red, yellow, green and violet). The smoke mixture is composed of a mixture of potassium chlorate, sodium bicarbonate, lactose and a dye, all of which have—in the amounts or quantities specified in the EIS—no significant environment effect. In addition, most of the filler is |

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| | | environmental impact. Even at low concentrations, pollutants can cause serious problems. Because the Navy plans to almost double the amount of pollutants from smoke grenades and flares, it needs to take a hard look at the potential environmental impacts of such a drastic increase in pollution.<br><br>Likewise, the Navy plans to double its surface and underwater detonations. See SSTC DEIS at 3.5-22, tbl 3.5-7; 3.5-25, tbl 3.5-8. Yet the Draft EIS assumes there will be no measurable impact on water quality, even though "combustion is less than 100 percent and residues of these hazardous materials may remain in the water and sediment." See SSTC DEIS at 3.5-25. The Draft EIS provides no support or justification for this conclusion.<br><br>The Draft EIS also fails to examine the cumulative, long-term impacts of increasing the amount of pollutants released into the ocean and bay. Under NEPA, the Navy must examine the direct, indirect, and cumulative impacts of its proposed action. Here, the Navy has failed to examine the cumulative impacts of doubling the amount of hazardous pollutants it puts into our waters each year. To satisfy its NEPA requirements, the Navy must fully examine the cumulative impacts of increased water pollution. | consumed during use. Chemical composition of military flares can be a combination of magnesium, boron, potassium perchlorate, and barium chromate (USAF 1994) or, in some cases red phosphorus. Red phosphorus is a common ignition compound used for instance in matches. Red phosphorus is a relatively non-toxicity compound, although highly flammable, and subject to environmental degradation in marine systems (Spanggord et al. 1985, EFRB 2010). In an analysis of military flares, the US Air Force found that most of the common flare constituents were consumed during flare ignition. Residual ash from flares contained small quantities of magnesium and boron (USAF 1994). Measured values of magnesium in flare ash [86 part per million (ppm)] were found to be below the natural seawater composition of magnesium (1,290 ppm).<br><br>Potassium perchlorate was not a substantial residue, and was not detected in the ash samples measured. In the rare instance that any perchlorate were to remain, perchlorates are highly soluble, and the ions have a limited tendency to interact with other dissolved chemical species or to adsorb to aquifer materials under typical environmental conditions (Clausen et al 2007). Pechlorate in marine aquatic systems would be subject to environmentally significant bacterial degradation (Urbansky 1998, Logan et al. 2001, Brown and Gu 2006, Petrisor 2006, Wilkin et al. 2007).<br><br>Therefore, given the limited, short-term potential for smoke grenade and flare residuals to fall into San Diego Bay and the ocean, the relatively low levels of actual constituent released, and the natural environmental degradation of these compounds, the relative risk from use of these items is not substantial.<br><br>A comparison to related pyrotechnics with substantially more constituents can be made within the San Diego region. For example, the San Diego Regional Water Quality Control Board required water and sediment monitoring by Sea World |

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| | | | due to daily firework displays over Mission Bay. On average, Sea World conducts 100-120 shows per year, with each show using up to 250 shells, and up to 1,750 shells for special holidays (SDRWQCB 2007). In support of the concern for potential environmental contamination from fireworks residue, water and sediment samples were taken from 2001 through 2006 as part of a Coastal Commission permit requirement. Samples were analyzed for various constituents found in fireworks, including oxidizers (ammonium perchlorate and potassium perchlorate), metals (antimony, barium, copper, strontium) and salts (magnesium, sodium, etc.). The final monitoring report concluded that there were no substantial spatial or temporal patterns in concentrations of critical metals in sea water or sediments in the small area of Mission Bay subject to repeated large scale fireworks displays (SDRWQCB 2007)<br><br>Under the No Action Alternative, SSTC training activities require the detonation of small amounts of explosives on the water surface and underwater. While up to 1,610 pounds of explosives are used each year for underwater detonations (Table 3.5-7), the majority of these training events occur on the open ocean side of SSTC.<br><br>As discussed in Section 3.4.2.1.1 through 3.4.2.1.3 of the FEIS, high-order combustion of typical military explosives used at SSTC such as Royal Demolition Explosive (RDX) and pentaerythritol tetranitrate (PETN) consumes over 99.997 percent of the original explosive material during detonation, with by-products of common inert gases and relatively inert inorganic salts. For example, exploding 10 pounds of Composition (C)-4, which is 91 percent RDX, produces about 3.7 pounds of nitrogen, 25 pounds of $CO_2$, 1.6 pounds of water, 1.8 pounds of carbon monoxide, 0.2 pound of ethane, 0.03 pound of hydrogen, 0.02 pound of propane, 0.09 pound of ammonia, and 0.02 pound of methane. The major products of combustion-nitrogen, $CO_2$, and water-are all common natural |

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| | | | components of the atmosphere and water. Any explosive residue (<0.003 percent) would be relatively insignificant and would be either quickly dispersed by local ocean currents (Section 3.5.1.3.4) , or buried in ocean sediment. Field studies conducted by the US Army indicate that explosives residue includes 0.003 percent or less of the original quantity of material detonated, although the amounts of explosives residues vary among different types of ordnance. Land-based studies show that, for large ordnance items such as bombs, high-order detonations may spread residual particles in the micron and submicron-sized range over hundreds of square meters. However, individual quantities of explosives used at SSTC are substantially smaller than those tested by the Army, which means smaller amount of original detonation material and less explosive velocity. In addition, SSTC explosive events occur in water rather than on land, and would be subject to substantially less dispersion due to the non-compressibility of water. Given the nature of training events at SSTC, low order detonations, while possible, are not the desired training outcome, and any remnants are retrieved to the greatest extent practical to diagnose what may have caused the low-order detonation.<br><br>The environmental fate and effect of military munitions constituents including RDX have been subject to a number of scientific studies to determine if these compounds represent a risk in the marine environment including water and sediment (Hawari 2000, Belden et al. 2005, Lotufo and Lydy 2005, Houston and Lotufo 2005, Rosen and Lotufo 2005, Juhasz and Naidu 2007, Rosen and Lotufo 2007a, 2007b, Boyd et al. 2008, Monteil-Rivera et al. 2008, Mukhi et al. 2008, Weber 2008, Lotufo et al. 2009, Lotufo et al. 2010, Rosen and Lotufo 2010, Zhao et al. 2010).<br><br>As a compound in the environment, RDX is subject to natural processes in marine systems that break down (i.e., degrade) the parent molecule to inert nitrogen compounds. Processes |

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| | | | include hydrolysis in marine water, photodegradation from light, uptake and metabolism from marine plants, and bacterial degradation in water and sediment (Hawari 2000, Juhasz and Naidu 2007, Boyd et al. 2008, Monteil-Rivera et al. 2008, Lotufo et al. 2009, Weber 2008, Zhao et al. 2010). Based on both laboratory toxicity testing and more realistic environmental exposure scenarios, RDX has also shown low to no toxicity and no potential for bioaccumulation to a variety of marine species including amphipods, mussels, and fish (Belden et al. 2005, Lotufo and Lydy 2005, Houston and Lotufo 2005, Rosen and Lotufo 2005, Rosen and Lotufo 2007a, 2007b, Mukhi et al. 2008, Lotufo et al. 2009, Lotufo et al. 2010, Rosen and Lotufo 2010).<br><br>Therefore, based on the limited amount of explosive residue actual deposited during SSTC training events, dispersion and natural degradation of any small amount of residue, and limited toxicity to marine organisms, the overall effect on the environment from in-water explosives use would be insignificant. |
| 302. | San Diego Bay Council | II. The Navy's Proposed Plan Will Interfere With Public Access to the Ocean and Bay.<br><br>The Draft EIS states that in total, "training would require closure of portions of the ocean or bay for about 7,500 hours per year " or 312 days per year. See SSTC DEIS at 3.5-25. This would mean that portions of the ocean or bay would be closed "for about 85 percent of the year if no training were conducted currently. " See SSTC DEIS at 3.5-25. The Draft EIS suggests that training will "likely overlap in time in an unpredictable way, which would result in multiple areas being closed for a shorter percentage of the year." See SSTC DEIS at 3.5-25.<br><br>What the Draft EIS does not address is how many of those hours of closure and training activity would occur during the daylight hours when the public is most likely to use the ocean or bay. If San Diego receives, on average, between seven and ten hours of sunlight per day, that can add up to only around 3,000 hours of sunlight per year (Based on San Diego's average conditions, it is estimated that San Diego receives approximately 3,012 hours per year of sunlight. See http://www.bbc.co.uk/weather/world/city_guides/results.shtml?tt=TT001510). If the Navy plans to close the ocean and bay 7,500 hours per year, it is possible to have the bay and ocean closed during all hours of sunlight in a given year.<br><br>Disturbingly, the Draft EIS includes -but completely disregards- the City of Imperial Beach's | It is very difficult to indicate, due to scheduling flexibility and changes, the exact overlap in training activities. The EIS indicates that training activities would close portions of the ocean or the bay. Table 2-2 in Chapter 2 indicates not only the number of each activity, but also the possible area in which it could take place. The listing of areas does not indicate that each activity occurs in this entire area.<br><br>It is possible, and quite reasonable to assume, that there may be an activity that occurs in Boat Lane 1 at the same time as a training activity is occurring at Beach Lane 6 as well as an activity occurring in Echo. Further, these are all discrete areas which the public can circumvent. |

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| | | annual estimates of use for shore and nearshore recreation. See SSTC DEIS at 3.5-18. Those estimates show that along Imperial Beach's 3.5 miles of beach front, there were 1.8 million beachgoers, 8,000 beach anglers, and 400 fishing boats providing an estimated 10,000 fishing trips. See SSTC DEIS at 3.5-18. The Draft EIS ignores the data, claiming it is not "quantitative information on the actual use of ocean waters off Imperial Beach, and may not be representative of other beach areas, such as Silver Strand State Beach or Coronado Municipal Beach. " See SSTC DEIS at 3.5-18.<br><br>By ignoring the best information available on ocean use and recreation, the Draft EIS downplays the impact the proposed project will have on public access to the ocean and bay. The Draft EIS actually suggests that the impact will be negligible because "the size of the water area that would be closed for each training activity is relatively small when compared to the total bay and ocean waters available for the uses described in the Basin Plan." SSTC DEIS at 3.5-26. But the Draft EIS fails to look at the cumulative impact of all the training activities on the waters' designated uses, including recreation. This lack of analysis fails to meet the necessary hard look the National Environmental Policy Act requires. | |
| 303. | San Diego Bay Council | III. The Navy Fails to Take a Hard Look at the Impacts of Increased Training on Endangered Species.<br><br>The Navy's plan to expand training activities and increase training frequency will have negative impacts on several endangered species, including the western snowy plover, the California least tern, and the San Diego fairy shrimp. The San Diego Audubon Society has already articulated several concerns we have about the proposed project's impact on endangered species. Among these concerns are cumulative impacts, lack of meaningful alternatives, noise impacts, mitigation, and lack of analysis of the indirect impacts on chicks and eggs abandoned because of increased training activities. We are also seriously concerned about the decline in the number of lest tern fledglings over the past several years. The Navy's analysis fails to address how the increased training will not further exacerbate this serious decline in fledglings. Also, the Navy fails to articulate a well-reasoned, scientifically-based justification for protecting only 22 western snowy plover nests and how that alternative will protect the species. The Navy must take a hard look at the direct, indirect, and cumulative impacts on the western snowy plover and California least tern in order to satisfy its NEPA requirements. Also, the Navy must satisfy its requirements under the Endangered Species Act to protect these endangered birds.<br><br>In addition to the snowy plover and the California least tern, the San Diego fairy shrimp also calls Silver Strand Training Complex home. See Silver Strand Training Complex Draft EIS (SSTC Draft EIS) at 3.11-13, Fig. 3.11-4. The San Diego fairy shrimp is among the most endangered species in the country; on a scale of 1-18, with one being the highest, the San Diego fairy shrimp ranks as a "2 " on the recovery priority scale. See SSTC Draft EIS at 3.11-12.<br><br>So far, the Navy has taken important steps to protect the San Diego fairy shrimp. Under the current management plan, the Navy "restricts all activities from the [vernal] pools at all times." | In response to this and other comments received, the Navy has revised the EIS analysis on the California least tern (Section 3.12.3.1 of the FEIS) and the western snowy plover (Section 3.12.3.2 of the FEIS) to provide a more in-depth analysis of impacts that training is expected to have on the species. Additional analysis has been provided on the indirect and direct impacts of current and proposed military training, to include both an average anticipated impact as well as a high-intensity anticipated impact. Noise impacts are analyzed for the listed avian species. Additional mitigation measures have been added to the Proposed Action. The benefits of current and proposed mitigation are also described. As discussed in the analysis, the benefits of mitigation are expected to outweigh potential adverse impacts of training. The Navy has consulted with the USFWS, and received a Biological Opinion which indicates that proposed training activities will not jeopardize the continued existence ESA-listed species. The EIS does analyze noise and its effect on wildlife. Existing noise levels do not appear to cause nest abandonment, and projected noise levels are not very different, considering the noise source location and the location of nesting avian species.<br><br>Vernal pools - The Navy will avoid the occupied vernal pools |

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| | | See SSTC Draft EIS at 3.11-33. But now the Navy plans to roll back protections for the San Diego fairy shrimp and "allow foot traffic associated with training activities in vernal pools when conditions are dry." See SSTC Draft EIS at 3.11-41. The Navy has failed to explain why it needs to allow foot traffic in vernal pools that house a critically endangered species or how allowing foot traffic in the pool when the Navy deems the pools "dry " protects the San Diego fairy shrimp. By failing to provide this information and analysis, the Navy has failed to take a hard look at the environmental impacts of its proposed increased training. | and their watersheds adjacent to the road at SSTC-S Inland (i.e., pools 1 through 7 marked with flexi-stakes) year-round, to the maximum extent consistent with training needs. Foot traffic when the pools are dry consists primarily of small groups. As presented in Section 3.11 of the FEIS, trail forming and soil compaction are unlikely, resulting in no impact to population viability. Additionally, the Navy has completed consultation with the USFWS, and has received a signed Biological Opinion which concludes that proposed training activities will not jeopardize the continued existence of San Diego fairy shrimp.<br><br>As part of the conditions of the Biological Opinion, the Navy will be completing a Vernal Pool Management and Monitoring Plan to help determine whether the impacts identified in the EIS remain at the low levels expected. The Plan will include a focused invasive plant inspection survey in the pools and their watersheds; plant, topographic, hydrological, and water quality surveys (including salinity); and protocol fairy shrimp surveys. In addition, the Navy will be determining the baseline distribution and abundance of San Diego fairy shrimp and condition of the vernal pool habitat prior to initiating training activities in or around the vernal pools at SSTC-S Inland. If impacts are more substantial than the low levels anticipated or if impacts could lead to the extirpation of fairy shrimp from any individual pool, then the Navy will reinitiate consultation with the USFWS. |
| 304. | San Diego Bay Council | A. The Navy Fails to Explain Why It Needs to Allow Foot Traffic in the San Diego Fairy Shrimp's Vernal Pools to Meet the Project's Basic Purpose of Improved Training.<br><br>The Navy suggests that it needs to allow foot traffic in the vernal pools because some training activities require space to maneuver. See SSTC Draft EIS at 3.11-43. But the Silver Strand Training Complex—South is 548 acres of land, and the San Diego fairy shrimp has been found in vernal pools taking up only around 4 acres of land. See SSTC Draft EIS at 1-3; 3.11-13, Fig. 3.11-4. The Navy does not explain why walking in those very small, ecologically fragile areas is fundamental to providing better training. Further, the Navy suggests that allowing foot traffic in the vernal pools is "needed " if "other areas are scheduled and no other training areas are available " See SSTC Draft EIS at 3.11-43. In other words, the Navy wants to trade protection of a critically endangered species for added scheduling convenience—for only 11 of the 78 different activities the Navy schedules. See SSTC Draft EIS at 3.11-43, 2-26. The Navy also suggests that walking in the vernal pools might be "needed " for "training diversity " without | Information on the necessity of realistic training activities at SSTC-S has been added to Section 3.11.2.3.3. Some vernal pools will need to be used for training. Restricting training to other areas would decrease the efficacy of training activities.<br><br>The Navy will use scheduling and planning measures to minimize the potential for incidental take of San Diego fairy shrimp. The Navy will avoid the occupied vernal pools and their watersheds adjacent to the road at SSTC-S Inland (i.e., pools 1 through 7 marked with flexi-stakes) year-round, to the maximum extent consistent with training needs. Foot traffic when the pools are dry consists primarily of small groups. As |

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| | | explaining what "training diversity " walking in the vernal pools would provide—other than trampling a fragile ecosystem.<br><br>B. The Navy Fails to Analyze the Impacts to the San Diego Fairy Shrimp of Allowing Foot Traffic in the Vernal Pools When the Pools are "Dry"<br><br>The Navy proposes to allow people to tramp through the vernal pools the San Diego fairy shrimp call home when a botanist or wildlife biologist determines that the pools are "dry. " See SSTC Draft EIS at 3.11-43. The Navy has not analyzed the environmental impacts of this plan to the existing fairy shrimp populations or to the ongoing viability of the fairy shrimp population at Silver Strand Training Complex—South. | presented in Section 3.11 of the FEIS, trail forming and soil compaction are unlikely, resulting in no impact to population viability. Additionally, the Navy has completed consultation with the USFWS, and has received a signed Biological Opinion which concludes that proposed training activities will not jeopardize the continued existence of San Diego fairy shrimp.<br><br>As part of the conditions of the Biological Opinion, the Navy will be completing a Vernal Pool Management and Monitoring Plan to help determine whether the impacts identified in the EIS remain at the low levels expected. The Plan will include a focused invasive plant inspection survey in the pools and their watersheds; plant, topographic, hydrological, and water quality surveys (including salinity); and protocol fairy shrimp surveys. In addition, the Navy will be determining the baseline distribution and abundance of San Diego fairy shrimp and condition of the vernal pool habitat prior to initiating training activities in or around the vernal pools at SSTC-S Inland. If impacts are more substantial than the low levels anticipated or if impacts could lead to the extirpation of fairy shrimp from any individual pool, then the Navy will reinitiate consultation with the USFWS. |
| 305. | San Diego Bay Council | 1. The Navy May Determine the Vernal Pools are "Dry" when Fairy Shrimp are Maturing or Adult Shrimp are Present.<br>The Navy anticipates that the vernal pools will be deemed "dry" "50 to 95 percent of the year", which could also include "intermittent times during the rainy season, rather than during a defined dry period. " See SSTC Draft EIS at 3.11-43. The Draft EIS does not explain how the "qualified person" overseen by a Navy botanist or wildlife biologist will determine when the vernal pools are wet or dry. See SSTC Draft EIS at 3.11-43. The fact the Navy anticipates that or Endangered Species Act Section 7 consultation on green sea turtle at SSTC.□National<br><br>The Draft EIS recognizes that "[a]dult San Diego fairy shrimp are observed from January to March" but "in years with early or late rainfall, the hatching period may be extended. " See SSTC Draft EIS at 3.11-12. The Navy's 2002 Integrated Natural Resource Management Plan for the Naval Base Coronado (the "2002 Plan") also acknowledges that San Diego fairy shrimp "may appear after late fall, winter, or spring rains sufficiently fill their small, shallow pools (<30 cm deep)" and "[o]nce hatched, the fairy shrimp will mature in 10-20 days...and can live for over | As listed in the FEIS and in the signed Biological Opinion (July 7, 2010), the Vernal Pool Management and Monitoring Plan will list: 1) what criteria are used to determine that the pools are dry, and 2) who makes the "dry" determination, i.e., the qualifications of the person responsible for determining wet and dry conditions. The person overseeing the determination will have a USFWS fairy shrimp permit.<br><br>The estimate that the pools could be dry 50-95 percent of the time was based on a much drier than average year. The intent was not to plan to train in the pools that much of the year unless they were actually dry, but, rather, to attempt to |

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| | | a month." See 2002 Plan at 3-76, citing Eriksen and Belk 1999. But the Draft EIS provides no explanation of how the vernal pools could be dry up to 95% of the year when adult shrimp can be observed for at least 25% of the year and possibly in late fall, winter, or spring. Either this means that the Navy anticipates determining the vernal pools are "dry " when there are still adult fairy shrimp present, or the Navy has serious flaws in its analysis. | determine the maximum number of people who might cross the vernal pools on foot in any given year so the Navy could avoid underestimating impacts. |
| 306. | San Diego Bay Council | 2. The Navy Cites No Scientific Evidence That Allowing Foot Traffic Through the Vernal Pools When "Dry " Will Protect the Fairy Shrimp Population.<br><br>The Navy attempts to justify purposely scheduling foot traffic in the vernal pools when the pools are "dry " because "[t]his is the time when the shrimp are least vulnerable because they are encased in hard cysts at or near the soil surface-awaiting the return of wet conditions. " See SSTC Draft EIS at 3.11-44. But the Navy provides no evidence that the force of foot traffic through the vernal pools will not crush the fairy shrimp cysts.<br><br>On the contrary, it is well-settled that human encroachment into San Diego fairy shrimp habitat on foot or on motorized or non-motorized vehicles affects the species by crushing San Diego fairy shrimp cysts. See San Diego Fairy Shrimp 5-Year Review, U.S. Fish and Wildlife Service, 2008 ( "5-Year Review") at 28. Scientists have demonstrated that San Diego fairy shrimp cysts can be crushed under minimal weight-less than 100 grams, or 0.2 pounds, of force—when dry. See 5-Year Review at 28, citing Hathaway et al. (1996). Because cysts are so fragile, even when the vernal pools are dry, allowing people to walk or run through the vernal pools will crush and destroy the fairy shrimp cysts.( The American Academy of Podiatric Sports Medicine estimates that, while running, the feet strike at a force of three to four times the body's weight. See http://www.aapsm.org/running.html)<br><br>The Navy has not analyzed the short-term or long term impacts of allowing foot traffic in the vernal pools when they are "dry. " The Navy "conservatively " estimates that "10 percent of the people conducting training activity would enter into the vernal pools. " See SSTC Draft EIS at 3.11-43. The Navy provides no explanation of why this estimate is conservative other than "each activity is dispersed across the vernal pool area. " See SSTC Draft EIS at 3.11-43. And even under the conservative estimate, the Navy still anticipates that 207 people could enter the vernal pools each year. See SSTC Draft EIS at 3.11-43. | The Navy has analyzed for take of fairy shrimp cysts, and acknowledged that fairy shrimp cysts will be crushed and otherwise harmed, such as by displacement into areas they cannot survive. For this reason, the USFWS has issued a take allowance for the training activity as listed in the signed Biological Opinion (July 7, 2010). The conservative estimate of the number of people that would enter the pools each year was estimated by considering the percent of the training area occupied by pools, and overlaying the footprint of each of the different activities that could enter the pools. The Biological Opinion also concludes that the Proposed Action is not likely to jeopardize the continued existence of this species. |

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| 307. | San Diego Bay Council | The Navy has not analyzed what effect moving from no foot traffic to over 200 people tramping through the vernal pools each year will have on the short-term and long-term viability of the San Diego fairy shrimp population. The Navy acknowledges that the fairy shrimp could be negatively impacted by being moved to unsuitable locations or by changing the topography or water quality in the vernal pools, but never acknowledges that foot traffic can and will crush fairy shrimp cysts. See SSTC Draft EIS at 3.11-44. Because the Navy ignores the reality that foot traffic in the vernal pools will crush cysts, it never analyzes how devastating foot traffic will be to the long-term viability of the fairy shrimp.<br><br>San Diego fairy shrimp cyst "banks " develop in pool soils that are composed of cysts from several years of breeding. See 5-Year Plan at 5. This partial hatching of cysts allows the San Diego fairy shrimp to persist in its extremely variable environment, since pools commonly fill and dry before hatched individuals can reproduce, and if all cysts hatched during an insufficient filling the species could be extirpated from a pool. See 5-Year Plan at 28, citing Philippi et al. 2001, Simovich 2005a, Simovich and Hathaway 1997. The U.S. Fish and Wildlife Service has emphasized that the ability of San Diego fairy shrimp to develop and maintain cyst banks is vital to the long-term survival of San Diego fairy shrimp populations. See 5-Year Plan at 5, citing Ripley et al. 2004, Simovich 2005a.<br><br>The Navy must take a hard look at the long-term impacts of foot traffic on the fairy shrimp. The U.S. Fish and Wildlife Service has cautioned that cyst-crushing impacts, like foot traffic, may accumulate over time, leading to a decline of cysts below a number necessary to support a viable population. See 5-Year Plan at 17. The Navy must do a thorough analysis of the impact of its proposed plan on the critically endangered San Diego fairy shrimp. The Navy must at least address the following questions:<br><br>Which vernal pools at Silver Strand Training Complex-South have cysts in them?<br>How many steps will be taken in each vernal pool each year?<br>How many cysts will be crushed by each footstep in the vernal pool?<br>How many cysts are in each vernal pool?<br>How many cysts need to survive in order to ensure a long-term viable population of fairy shrimp?<br>How will the foot traffic in the vernal pools impact fairy shrimp breeding?<br>What impact will long-term foot traffic through the vernal pools have on the fairy shrimp population at Silver Strand Training Complex—South?<br><br>Answering these questions is crucial not only to comply with the Endangered Species Act, but to meet the National Environmental Policy Act's requirements that the Navy take a hard look at the environmental impacts of its proposed project. Without answering these questions, the Navy cannot meet its National Environmental Policy Act obligations. | The Navy has made educated assumptions to base its estimate of impact to vernal pools, and has requested a take allowance from the USFWS for the impact, which is expected to be low. The Navy will avoid the occupied vernal pools and their watersheds adjacent to the road at SSTC-S Inland (i.e., pools 1 through 7 marked with flexi-stakes) year-round, to the maximum extent consistent with training needs. Foot traffic when the pools are dry consists primarily of small groups. As presented in Section 3.11 of the FEIS, trail forming and soil compaction are unlikely, resulting in no impact to population viability. Additionally, the Navy has completed consultation with the USFWS, and has received a signed Biological Opinion which concludes that proposed training activities will not jeopardize the continued existence of San Diego fairy shrimp.<br><br>As part of the conditions of the Biological Opinion, the Navy will be completing a Vernal Pool Management and Monitoring Plan to help determine whether the impacts identified in the EIS remain at the low levels expected. The Plan will include a focused invasive plant inspection survey in the pools and their watersheds; plant, topographic, hydrological, and water quality surveys (including salinity); and protocol fairy shrimp surveys. In addition, the Navy will be determining the baseline distribution and abundance of San Diego fairy shrimp and condition of the vernal pool habitat prior to initiating training activities in or around the vernal pools at SSTC-S Inland. If impacts are more substantial than the low levels anticipated or if impacts could lead to the extirpation of fairy shrimp from any individual pool, then the Navy will reinitiate consultation with the USFWS. |

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| 308. | San Diego Bay Council | 3. The Navy Must Survey Existing Fairy Shrimp Populations in Order to Analyze the Impacts of the Proposed Action on the Fairy Shrimp.<br><br>The Navy's analysis in the Draft EIS is based on a study from 2003 of whether or not the San Diego fairy shrimp was present in a vernal pool. See SSTC Draft EIS at 3.11-13 Fig. 3.11-4. Before taking such a drastic measure as to allow foot traffic in the vernal pools, the Navy must gather more updated information about the existing population of fairy shrimp in vernal pools at the Silver Strand Training Complex-South. The Navy should have been monitoring fairy shrimp populations under its plan set forth in the 2002 Plan, as the plan states that the Navy will "monitor the status of the fairy shrimp population." 2002 Plan Coronado at 4-29.<br><br>According to the Draft EIS, the Navy plans to start surveying for the fairy shrimp every five years. See SSTC Draft EIS at 3.11-43. But relying on 7-year old information as a baseline and then not looking at impacts to the fairy shrimp population for 5 years is insufficient to protect the critically endangered fairy shrimp. In 5 years, the Navy could potentially cause such extensive damage to the fairy shrimp as to devastate the population. This is directly contrary to the Navy's promise in the 2002 Plan to "seek opportunities to restore vernal pool habitats that have been disturbed, while considering potential impacts to the federally endangered San Diego fairy shrimp." See 2002 Plan at 4-29. | The Navy will determine the baseline distribution and abundance of San Diego fairy shrimp and the condition of the vernal pool habitat prior to initiating training activities in or around the vernal pools at SSTC-S Inland. The Navy will report monitoring results and any observed incidental take to the USFWS annually, and will adjust management to the vernal pools occupied by San Diego fairy shrimp to minimize any training impacts detected by monitoring. If impacts are more substantial than the low levels anticipated or if impacts could lead to the extirpation of fairy shrimp from any individual pool, then the Navy will reinitiate consultation with the USFWS. Monitoring will be conducted annually per the Biological Opinion.<br><br>Consistent with the USFWS Biological Opinion, the Navy will mark pools to facilitate monitoring, and monitor the occupied vernal pools and their watersheds at the SSTC-S Inland to determine the baseline and ongoing conditions regarding: San Diego fairy shrimp distribution and abundance; botanical resources; topography; hydrology; and water chemistry (including salinity). The Navy will submit a draft monitoring plan to UISFWS and allow USFWS at least 30 days to review and approve this plan. The plan will include a map of SSTC-S Inland training area boundaries and vernal pools, and the following provisions to establish baseline conditions: a) focused invasive plant survey including visual/photo point inspection of vernal pools and their watersheds; b) plant, topographic, hydrological and water quality surveys/data; and c) protocol fairy shrimp surveys of the vernal pools. The plan will outline the qualifications necessary for personnel that determine if all the pools in a given unit are "dry", as well as the methodology for determining that the pools are dry. The plan will include the following provisions for monitoring ongoing conditions to determine if training impacts have occurred: a) focused invasive plant monitoring and visual/photo point inspection of vernal pools and their watersheds annually; b) plant, topographic, hydrological and |

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| | | | water quality monitoring every 2 years; and c) protocol fairy shrimp surveys of the vernal pools every 3 years. Annual monitoring reports will identify management measures to minimize any training impacts detected by monitoring (e.g., spread of invasive weeds, change in pool topography). The results of each year's monitoring will be submitted to USFWS annually. Baseline monitoring will be completed prior to initiating training activities in or around the vernal pools at SSTC-S Inland."<br><br>In summary, focused invasive plant surveys, including visual/photo point inspection of vernal pools and their watersheds, will be done annually. Plant, topographic, hydrological, and water quality monitoring are to be done every two years, and protocol fairy shrimp surveys are to be done every three years. |
| 309. | San Diego Bay Council | C. The Navy's Plan to Allow Foot Traffic in the Vernal Pools is Inconsistent with the Navy's Commitments it Made to Protect the San Diego Fairy Shrimp.<br><br>The Navy's plan to reverse its prior policy of protecting the San Diego fairy shrimp at Silver Strand Training Complex-South reneges promises made to "provide a benefit to the San Diego fairy shrimp." See Designation of Critical Habitat for San Diego Fairy Shrimp, 72 Fed. Reg. 70,648, 70,678 (Dec. 12, 2007).<br><br>When the U.S. Fish and Wildlife Service designated critical habitat for the San Diego fairy shrimp, it considered designating vernal pools at the Silver Strand Training Complex-South as critical habitat (The Silver Strand Training Complex-South was referred to as the "Naval Radio Receiving Facility" in the Federal Register in 2007). But the U.S. Fish and Wildlife Service determined that conservation efforts in the 2002 Plan "provide a benefit to the San Diego fairy shrimp. " 72 Fed. Reg. 70,678. Based on those conservation measures, the U.S. Fish and Wildlife Service exempted vernal pools at Silver Strand Training Complex-South from critical habitat designation under Section 4(a)(3) of the Endangered Species Act.<br><br>Endangered Species Act §4(a)(3)(B)(i) provides that the Secretary of the U.S. Fish and Wildlife Service shall not designate lands controlled by the Department of Defense as critical habitat if the land is: (1) subject to an integrated natural resources management plan and (2) if the Secretary determines in writing that such plan provides a benefit to the species. See 16 U.S.C. § 1533(a)(3)(B)(i). In 2007, the U.S. Fish and Wildlife Service determined that the 2002 Plan protected and benefitted the San Diego fairy shrimp. | The 2002 INRMP for Naval Base Coronado is being updated revised, and will reflect the content of this EIS. The vernal pool management measures proposed are new, and the USFWS will decide if the Navy still provides a benefit to the pools, and whether critical habitat should be designated on Navy land regardless of the INRMP currently being updated. The Navy provides invasive species control, inventory, and periodic surveys. The Navy will be completing a Vernal Pool Management and Monitoring Plan to help determine whether the impacts identified in the EIS remain at the low levels expected. The Plan will include a focused invasive plant inspection survey in the pools and their watersheds; plant, topographic, hydrological, and water quality surveys (including salinity); and protocol fairy shrimp surveys.<br><br>The Navy's analysis was based on the best available science; however, there is inherent variability and uncertainty. It is correct that the Navy does not know the impact that introducing training to this area will have on occupancy of the vernal pools. As part of the conditions of the Biological |

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| | | Specifically, the U.S. Fish and Wildlife Service determined that the Navy would protect and benefit the San Diego fairy shrimp because the Navy promised in the 2002 Plan to: (1) monitor the status of San Diego fairy shrimp populations; (2) post signs around vernal pools; (3) advise personnel to keep vehicles on the main roads while traveling through the property; and (4) seek opportunities to restore disturbed vernal pool habitats while considering potential impacts to the San Diego fairy shrimp. See 72 Fed. Reg. 70,678. | Opinion, the Navy will be completing a Vernal Pool Management and Monitoring Plan to help determine whether the impacts identified in the EIS remain at the low levels expected. The Plan will include a focused invasive plant inspection survey in the pools and their watersheds; plant, topographic, hydrological, and water quality surveys (including salinity); and protocol fairy shrimp surveys. In addition, the Navy will be determining the baseline distribution and abundance of San Diego fairy shrimp and condition of the vernal pool habitat prior to initiating training activities in or around the vernal pools at SSTC-S Inland. If impacts are more substantial than the low levels anticipated or if impacts could lead to the extirpation of fairy shrimp from any individual pool, then the Navy will reinitiate consultation with the USFWS.<br><br>With regard to critical habitat, the National Defense Authorization Act of 2004, Public Law 108-136 recognizes INRMP conservation measures and species benefit that could obviate the need for critical habitat designation on Navy lands. As mentioned above, the Navy is developing a Vernal Pool Management Plan, and is being issued approval for incidental take under the ESA (the USFWS Biological Opinion concurs that the Navy will not affect the viability of the species). |
| 310. | San Diego Bay Council | The U.S. Fish and Wildlife Service also determined in 2007 that "[a]ctivities occurring on [Silver Strand Training Complex-South] are currently being conducted in a manner that minimizes impacts to San Diego fairy shrimp habitat." 72 Fed. Reg. 70,678. In 2007, management of vernal pools under the 2002 Plan restricted "all activities from the pools at all times." SSTC Draft EIS at 3.11-33.<br><br>The Navy's plan to degrade the vernal pools by allowing foot traffic through the pools and authorizing emergency vehicles to drive through the pools is a sharp departure from its prior management. The Navy is essentially pulling a "bait and switch " on the U.S. Fish and Wildlife Service, escaping protective critical habitat designation for its land based on a management plan it is scrapping just three years later. The Navy plans to allow emergency vehicles to drive in the vernal pools, despite the fact that the U.S. Fish and Wildlife Service "consider[s] vehicle use in vernal pool habitat" a substantive threat to the San Diego fairy shrimp. " 5-Year Review at 17. And the Navy plans to allow virtually unrestricted foot traffic in the vernal pools without first surveying the extent of existing fairy shrimp populations and analyzing the impact the inevitable crushing of fairy cysts will have on the ongoing viability of the critically endangered San Diego | This is a reference to the INRMP for Naval Base Coronado, which is being revised and will incorporate the measures described in this EIS. National Defense Authorization Act of 2004, Public Law 108-136 to recognize INRMP conservation measures and species benefit that could obviate the need for critical habitat designation on Navy lands. The Navy will avoid the occupied vernal pools and their watersheds adjacent to the road at SSTC-S Inland (i.e., pools 1 through 7 marked with flexi-stakes) year-round, to the maximum extent consistent with training needs. Foot traffic when the pools are dry consists primarily of small groups. As presented in Section 3.11 of the FEIS, trail forming and soil compaction are unlikely, resulting in no impact to population viability. Additionally, the Navy has completed consultation with the |

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| | | fairy shrimp population at Silver Strand Training Complex-South.<br><br>The Navy's plan to allow foot traffic and emergency vehicles in the vernal pools at Silver Strand Training Complex-South could be disastrous for the critically endangered San Diego fairy shrimp. The Navy should abandon this ill-conceived and un-examined plan unless and until it can demonstrate with a thorough and honest analysis that the plan will satisfy the Navy's promise to "provide a benefit to the San Diego fairy shrimp. " See 72 Fed. Reg. 70,678. | USFWS, and has received a signed Biological Opinion which concludes that proposed training activities will not jeopardize the continued existence of San Diego fairy shrimp.<br><br>As part of the conditions of the Biological Opinion, the Navy will be completing a Vernal Pool Management and Monitoring Plan to help determine whether the impacts identified in the EIS remain at the low levels expected. The Plan will include a focused invasive plant inspection survey in the pools and their watersheds; plant, topographic, hydrological, and water quality surveys (including salinity); and protocol fairy shrimp surveys. In addition, the Navy will be determining the baseline distribution and abundance of San Diego fairy shrimp and condition of the vernal pool habitat prior to initiating training activities in or around the vernal pools at SSTC-S Inland. If impacts are more substantial than the low levels anticipated or if impacts could lead to the extirpation of fairy shrimp from any individual pool, then the Navy will reinitiate consultation with the USFWS. The Navy prohibits driving of vehicles off of established roads at SSTC-S Inland, There may be infrequent emergency vehicle use in emergency situations The Navy does not have a record of such use in the pools, and the Navy anticipates that such an occurrence might never happen. Yet the possibility of cyst crushing and displacement by emergency vehicles is acknowledged in the EIS. |
| 311. | San Diego Bay Council | CONCLUSION<br><br>The Navy must analyze the direct, indirect, and cumulative impacts that pollutants from grenades, flares and explosives will have on water quality. It should provide scientifically-supported analysis of those impacts in the final environmental impact statement. The Navy still needs to take a hard look at the impacts the increased training will have on public access to the ocean, bay, and beaches, air quality, traffic, and noise.<br><br>The Navy's analysis of the proposed project's impacts to endangered species such as the western snowy plover, the California least tern, and the San Diego fairy shrimp is woefully inadequate. The Navy cannot withhold serious environmental impacts analysis from the public during the NEPA process, regardless of any future plans the Navy might have to work with U.S. Fish and Wildlife Service to satisfy Endangered Species Act requirements. The National Environmental | Water Quality impacts are addressed in Section 3.5.2.3.2, Section 3.5.2.4.2, and Section 4.3.5 of the FEIS. That analysis concluded that trace amounts of training material residues – most of which are deposited on land rather than in the water – would not have a substantial direct or indirect effect on water quality. Federal and State of California water quality standards would not be violated. Discharges from regional wastewater treatment plants, other industrial facilities, and non-point source pollutant discharges affect ocean and Bay water quality; however, these pollutants generally differ in type (e.g., coliform bacteria, nitrogen, phosphorus) from the residues of |

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| | | Policy Act requires that the Navy take a hard look at all the reasonably foreseeable environmental impacts of the project-that it look before it leaps-and that the analysis be available to the public to fully vet the information. The Navy has not met its burden with regard to the San Diego fairy shrimp. | training activities, so there is no substantial cumulative effect.<br><br>The Navy has consulted with the USFWS, and the signed Biological Opinion (July 7, 2010) concluded that the Proposed Action would not jeopardize the continued existence of ESA-listed species. This Biological Opinion has been integrated into the EIS, including any additional mitigation measures (Section 5). The Navy's analysis is a matter of public record. All effects that can be anticipated by the action have been addressed. With implementation of the Proposed Action, losses in California least terns and western snowy plover nesting are expected to be minimally increased from baseline levels. The Navy and U.S. Fish and Wildlife Service (USFWS) have established mitigation measures to compensate for these losses. |
| 312. | Sierra Club, San Diego Chapter | At this time the Sierra Club is not requesting additional protective measures outside the current prevailing policy. In this regard, we strongly support the No Project alternative unless substantial improvements to the protectionist measures are made to Alternative 1. However, the Sierra Club alternatively makes its position known that Alternative 2 is highly undesirable in large part due to the reckless and permanent damage that will befall the endangered California Least Terns and Snowy Plovers in the project area. San Diego Country has more endangered species than any other county in the United States. If biodiversity indicates ecological well-being, San Diego County should be diagnosed with a near fatal disease and the only treatment is an aggressive stance for protection and conservation. The proposed increase in training operations has the catastrophic potential of affecting 13-20% of the statewide California Least Tern population as well as some of the most important Snowy Plover nesting habitats in Southern California.<br><br>If increased training operations are found to be an absolute necessity, preferential training sites must be identified. Those sites should be areas with the least possible amount of nesting and foraging. In order to properly identify these areas, the Navy must actively engage in research, data collection, and monitoring activities. Upon critical examination of the data collected, optimal nesting and foraging sites can be properly designated and military training can be conducted in accordance with all necessary precautions. | The Navy's program for more than 30 years has resulted in adaptive measures that have permitted both bird species to thrive, and further measures are proposed to minimize harm to the species. The Navy has allowed for a least tern and snowy plover haven to develop while providing protection over the last decades, to the extent that the Navy is managing an increasing percentage of the statewide populations (See Table 3.12-3 of the FEIS). The latest mitigation measures, listed in Section 3.12.1.5 of the FEIS, detail the current status of the Navy's stewardship of least terns and snowy plovers in San Diego Bay. Under the Proposed Action, the Navy will develop a Long Term Habitat Enhancement Plan for SSTC-N.<br><br>Alternative 2 will not in reality translate into full scale use of the set aside training lanes or automatic loss of western snowy plover nests. Training lanes hold different value for each type of training due to various factors, and the birds actually tend to nest in areas where less training occurs. The DEIS has been amended to explain the level of loss anticipated under the No Action Alternative compared to Alternative 1, estimated to be an increase of seven nests, on average, in a typical year. The |

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| | | | difference in incidental take for snowy plover between the No Action Alternative and Alternative 1 is one nest, on average, in a typical year.<br><br>As described in the FEIS and the signed Biological Opinion (July 7, 2010), the Navy will implement a mitigation measure to schedule training in areas where less nesting occurs, when possible, and still meet training needs. In addition, the Navy will schedule training activities that could be conducted on the hardpack portion of the beach during low tides when it is consistent with training needs. The Navy will develop a marking strategy to delineate least tern and snowy plover nesting areas that do not encumber training activities. Such a marking strategy may entail signage affixed to existing beach lane sign posts and a limited number of additional markers, as determined appropriate by Navy staff.<br><br>The extensive monitoring program that the Navy implements has allowed for adaptive management to ensure avoidance and minimization of take, as well as positive contribution to recovery of both species. Nesting activity has increased despite the average historical annual loss of 38 nests (Figure 3.12-9), indicating a capability of the species to not only continue to persist on SSTC, but also to increase, with training occurring in the nesting beaches during the nesting season. Much of this has to do with the Navy's mitigation measures and management practices. Based upon the available data, training activities at historical and proposed levels appear compatible with persistence of the least tern and western snowy plover at SSTC. Nesting areas have already been set aside on the bay side of the Silver Strand that exceed the mitigation required for all past and current consultations. |

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| 313. | Sierra Club, San Diego Chapter | Vernal Pools<br>Vernal pools are environmentally important and highly sensitive areas. Vernal pools have been around for thousands of years, at their peak there were approximately 28,500 acres of vernal pool habitat in San Diego County. By 1986, only 7% of those acres remained. A 1997 a report indicated that 70% of the remaining vernal pools were found on N.A.S. Miramar or Camp Pendleton. By 1995 95% of the vernal pools were destroyed. In 2001 it was reported that 2,400 vernal pools existed, and presently only 3% of the area's vernal pools remain.<br><br>In order to preserve this ever-diminishing vital natural resource, the Sierra Club endorses the continuation of the Navy's existing policy restricting all actives from vernal pools at all times. We appreciate the Navy's environmental intentions through the proposed wet season closures of the vernal pools. However, the limited closure is not sufficient to sustain the resource. Several species reside in this habitat, including endangered species like the San Diego Fairy Shrimp (Branchinecta Sandiegonenis). The Fairy Shrimp find the vernal pools indispensable to their lifecycle when they are inundated with water as well as when they are dry.<br><br>By the Navy's own admonition (see Table 3.11-3) both Alternatives 1 and 2, could adversely impact the Fairy Shrimp. Dry season impacts from potentially high volumes of foot traffic (12 to 207 individuals per year estimation, DEIS 3.11-43) carry with it the high probability of causing an extinction of the species. The fairy shrimp cysts (eggs) can be crushed and damaged, especially during the dry season. Foot traffic through the area would not only result in destruction of the cysts, but also allow for the introduction of invasive weeds, as soils are disturbed and changes to watershed hydrological system occur. As the soldiers traverse through the SSTC they are walking through areas that contain weedy species, and the seeds become attached to the soldier's shoes, clothing, and equipment. The seeds once transmitted to the vernal pools act as an invasive species resulting in shadowing, increased evaporation and transpiration rates, degrading the hardpan. Moreover, the USFWS has recognized that habitat degradation (and loss) is the single greatest threat to a species' survival. The Sierra Club would strongly encourage the Navy to continue working closely with the USFWS to implement the findings of their Biological Opinion when it is completed. What the plan requires is the designation of an area off-limits form training operations while data is collected and evaluated. The area would consist of all the existing and identified vernal pools. While the Navy does place a limit on the amount of activity when other shoreline areas are occupied, unavailable, or less suitable for training, this limitation merely bestows unfettered discretion and no actual limitations. An appropriate method, which should be explored as an alternative, in order to protect vital natural resources and critical habitat, is placing and maintaining, clearly designated barriers within 100 feet of the vernal pools and their functional watershed.<br><br>It is also strongly suggested that the Navy conduct new baseline studies, since those studies currently in use were conducted over seven years ago, between 2001 and 2003. Thus, the current conditions remain unknown and the only means of arriving at an adequate accounting of the pools, which currently contain Fairy Shrimp, is to conduct a more recent survey. Until such time | The Navy will use scheduling and other planning tools to minimize impacts to vernal pools, as listed in the FEIS (Section 3.12 and Section 5) and the signed Biological Opinion (July 7, 2010). The Navy will avoid the occupied vernal pools and their watersheds adjacent to the road at SSTC-S Inland (i.e., pools 1 through 7, marked with flexi-stakes) year-round, to the maximum extent consistent with training needs. The Navy will be completing a Vernal Pool Management and Monitoring Plan to help determine whether the impacts identified in the EIS remain at the low levels expected. The Plan will identify measures to minimize the potential for adverse effects to fairy shrimp from weed abatement, pool restoration, or pool augmentation. The Navy will be establishing the baseline distribution and abundance of San Diego fairy shrimp and the condition of the vernal pool habitat prior to initiating training activities in or around the vernal pools at SSTC-S Inland. The Navy will report monitoring results and any observed incidental take to the USFWS annually, and will adjust management to the vernal pools occupied by San Diego fairy shrimp to minimize any training impacts detected by monitoring. If impacts are more substantial than the low levels anticipated or if impacts could lead to the extirpation of fairy shrimp from any individual pool, then the Navy will reinitiate consultation with the USFWS.<br><br>Dry season disturbance is not likely to result in species extinction or extirpation from the site, due to summer dormancy of the shrimp as a cyst, and the low level of foot traffic expected. The USFWS has issued a take allowance for the proposed disturbance to the pools, as described in the signed Biological Assessment (July 7, 2010).<br><br>The Navy conducts annual surveys and treatment for invasive plants, and in recent years has been expanding treatment of iceplant. |

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| | | that a sufficient and timely survey has been performed, all pools exhibiting reasonable conditions for habitability by Fairy Shrimp should be fenced for protection of the species.<br><br>It is unwise to estimate the damage that could be caused to the complex ecology of the vernal pools from increased foot traffic. The Navy should proceed with their existing policy: restricting all activities from the pools at all times. If the Navy plans to proceed with the increased training operations within areas where vernal pools are known to exist, a multiyear analysis must be performed in order to fully evaluate the adverse impacts to the fairy shrimp and to the basic hydrology of the pools.<br>The Navy must also make note that species on the threatened and endangered lists are to be protected so they may achieve such numbers as to be delisted. The only methodology capable of achieving this goal is to protect their critical habitats. In the case of the San Diego Fairy Shrimp that critical habitat is the vernal pools during both the wet and dry periods. | |

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| 314. | Southwest Wetlands Interpretive Association | There is concern that potential additional operations could affect 13-20% of the statewide California Least Tern Population as well as some of the most important Snowy Plover nesting habitat in southern California but through cooperative effort with agencies like the USFWS this may be resolved. It is assumed the effects of training on Least Tern nesting sites at lanes 1-7 north of Silver Strand State Beach, SSSB, are compatible. Is there enough research data to support the concept of compatibility between tern nesting and training exercises at this site? This makes the important assumption that these birds are able to adapt to these activities without disruption which is important to know as training escalates. It is our hope that research and data collection will be carried out at this site and help answer these important questions about bird adaptation and military training.<br><br>We hope that there will be a high level of protection for Least Tern nesting and foraging including lanes 8 through 10.<br><br>Preferential training should be considered in lanes with the least nesting and foraging. But research, data collection and monitoring should lead to better management enhancing training and environmental protection.<br>We also want to encourage a high level of protection at Delta II North and Delta I South. These have been successful nesting and recruitment sites and we hope that they will continue to be maintained through management, and monitoring.<br><br>We hope that ongoing operations will be designed to maintain optimal nesting and foraging while carrying out the military mission. | The Delta Beaches will continue to be managed consistent with agreements with USFWS, to encourage nesting at these locations.<br><br>Preferential training will occur under Alternative 1. The criteria for using Blue 2, Orange 1, or Orange 2 are listed in Chapter 2 of the EIS<br><br>The Long Term Site Enhancement Plan, which is part of the Proposed Action, could increase the carrying capacity for terns by hundreds of nests. For snowy plovers, the long-term site enhancement plan is estimated to realistically mitigate for an estimated 34 nests annually.<br><br>The FEIS quantitatively estimates the amount of benefit provided by Navy management above and beyond that required by past projects, and that can be considered avoidance, minimization, and offsetting measures related to training. Besides setting aside real estate, the most important mitigation measure is probably predator control. The Navy has a number of predator management and control measures that it implements throughout the breeding season to minimize impacts of predators, including avian predators, ants, and mammals (see Section 3.12.1.5.3 of the FEIS for more detail). Predator control is considered by many species experts to be one of the most crucial management strategies for reproductive success (Foster 2006; USFWS 2006c). |

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| 315. | Southwest Wetlands Interpretive Association | Other issues that must be addressed include protection of vernal pools, predation and use of military working dogs.<br><br>We believe that vernal pools should be monitored and that research data collection will enable a reasonable approach to management meeting the needs of military operations and environmental protection. These sensitive habitats should be incorporated into biological off limit areas for training while data collection is evaluated. | Military working dogs are highly trained and under constant voice or leash control of the handler. While effects of recreational dogs in nesting areas are documented in scientific literature, the effects of leashed dogs that are highly trained in obedience and avoidance of wildlife in an area that is heavily used for military training is not yet known.<br><br>As a result of the consultation with USFWS, the Navy is proposing a study to assess impacts of MWDs military working dogs on California least tern and Western snowy plover nesting such that potential effects can be better understood. In compliance with the USFWS Biological Opinion (signed July 7, 2010), the NBC Natural Resources staff will brief all dog handlers annually, or more frequently if necessary, on guidelines pertaining to the use of military working dogs on SSTC beaches. These include that military working dog handlers will be notified weekly of the locations of plover nests and, to the maximum extent possible, remain a minimum of 30 meters (90 feet) from markers that delineate the locations of nesting plovers. If physical conditioning on soft pack sand is necessary, handlers and military working dogs will run on the sand road (SSTC-N) or within 20 feet of the hardpack sand to reduce the disturbance and impact to nesting terns and plovers. At SSTC-N, military working dogs will exercise primarily between beach lanes Yellow 1 and Blue 1, where they may cross the beach to get to the sand road at the existing route immediately to the north of the demo pit. The Navy will not conduct physical conditioning using dogs in the southern three beach lanes until: a) completing a study to evaluate the effects of military working dogs on terns and plovers and b) coordinating with the USFWS to develop conservation measures to minimize any additional effects. If military working dog training is requested as part of Platoon Over-the-Beach activities at SSTC-N, these activities will be scheduled in beach lanes Yellow 1, the northern half of Yellow 2, Green 1, or Green 2, pending the results of the Navy's study to evaluate the response of terns and plovers to |

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| | | | military working dog presence. The Navy will coordinate with the USFWS in the development of the study, and will submit the study design and scope of work to the USFWS for review and approval.<br><br>In compliance with the USFWS Biological Opinion, the Navy will use scheduling and/or planning measures to minimize the potential for incidental take of San Diego fairy shrimp, will establish the baseline distribution and abundance of San Diego fairy shrimp and condition of their vernal pool habitat at SSTC-S Inland and monitor training activities to ascertain the impact of training activities on San Diego fairy shrimp distribution and abundance within the action area, will report the monitoring results and any observed incidental take to the Service annually, and will manage the vernal pools occupied by San Diego fairy shrimp to minimize any training impacts detected by monitoring (including fencing off several pools). The DEIS was revised to indicate these terms and conditions. |
| 316. | Southwest Wetlands Interpretive Association | Predation is a serious problem. The Gull Billed Tern presents a danger for tern and plover chicks. It is not a listed species at this date but is under consideration. Predation is exacerbated by habitat loss for all these species and this problem must also be addressed.<br><br>Using the Endangered Species Act to protect a species must be solely a decision made by qualified scientists. The decision to list or delist a species must be made by the recovery team and should never be influenced by political policy and or public pressure.<br><br>The utilization of military working dogs should be coordinated in a way that does not lead to environmental impact.<br><br>The impact on near shore habitat and the interrelationship between the marine and beach ecosystems must be taken into consideration. This is especially important concerning least tern foraging. There is also interest in looking at the impact commercial bait fishing has on least tern foraging along the Silver Strand and the barrier beach at the Tijuana Estuary. The opportunity for research at these two sites has been suggested allowing for a comparative analysis of tern foraging success. Commercial bait fishing and military operations may impact tern foraging. Both sites are important to the bait fishing industry.<br><br>The potential impact of climate change and sea level rise is of great importance to extended use of the Silver Strand for military operations and as a nesting site for terns and plovers. Sea level rise will have ecological and military impacts at this site. The rise in sea level is at least 10 cm higher than it was in 1974 which is significant. This number is with reference to the TRNERR | Predation has been discussed in FEIS Section 3.12.1.3.1; California Least Tern and Section 3.12.1.3.2; Western Snowy Plover. A least tern foraging study funded by the Navy is underway and is being conducted in full compliance with the ESA. Cumulative impacts with bait fish are discussed in Section 4.3.12 of the FEIS.<br><br>Gull-billed tern predation studies are also underway by Navy and other funders (including USFWS), and the Navy has requested approval from USFWS to relocate Gull-billed terns, without success. A species viability analysis is under consideration for funding. The USFWS has not officially proposed the California least tern for downlisting. If and when they do, the proposal will be published in the Federal Register and will be open for public comment before a final decision is made.<br><br>The Navy is working closely with the USFWS to assist it in addressing gull-billed tern predation and impacts to western snowy plover and California least tern. The Navy has submitted an application for a depredation permit to the USFWS Migratory Birds annually since 2005, and has |

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| | | site which is relevant to the Silver Strand and the Cities of Imperial Beach and Coronado.<br><br>The SSTC-South is also an important issue. There are Western Snowy Plover nests on the beaches at this site. The Navy has not been able to control civilian recreational beach use and off leash dogs. This has been a major issue with the destruction of nests and has led to low population success. A coordinated effort should be made to control this site. The YMCA Camp Surf should be able to continue their youth program but must follow the rules. Violations would lead to potential closure of the site.<br><br>We want to encourage the Navy to work closely with the USFWS and implement the findings in the Biological Opinion when it is completed. | continued to document the impacts of this species. The Navy is supporting a radio-telemetry study by San Diego State University and USFWS during the 2010 nesting season. This study will research movements of gull-billed terns around San Diego Bay and analyze diet through stable isotopes.<br><br>As indicated in the USFWS Biological Opinion and described in the FEIS, the Navy will improve the delineation of base boundaries to facilitate improved enforcement in these areas. This delineation will include the installation of improved signage, k-rails, and a guard shack. At SSTC-N, temporary barriers and improved signage will be used to more clearly notify the public of the Navy's exclusive use of SSTC-N beach and existing restrictions on public usage of those beaches.<br><br>Military working dogs are highly trained and under constant voice or leash control of the handler. While effects of recreational dogs in nesting areas are documented in scientific literature, the effects of leashed dogs that are highly trained in obedience and avoidance of wildlife in an area that is heavily used for military training is not yet known. As a result of the consultation with USFWS, the Navy is developing a study to assess impacts of MWDs on California least tern and western snowy plover nesting such that potential effects can be better understood. |
| 317. | Southwest Wetlands Interpretive Association | The City of Imperial Beach has worked with the Navy in the past to establish a dog park near the base entry off Silver Strand Blvd. If the legal issues could be worked out between the Navy and the City this would enable people to use the dog park rather than the beach especially during the nesting season. The City and SWIA would also like to work with the Navy on completion of the Coast Trail from Oregon to Mexico. This is dependent upon the ability of the City, County and State to work with the Navy allowing this trail to cross Navy lands on the Silver Strand. The trail concept would go between the eastern Navy fence boundary and Highway 7S then continue to the area previously described as the dog park. From there it would go along Carnation Ave outside Navy land. See the included map.<br><br>The Dog Park and the coastal trail would help to mitigate recreational beach use and hence allow military operations and protection of plover nesting sites. The dune system from the Coronado/Imperial Beach City boundary to the Silver Strand State beach is in better condition than most dune systems in San Diego County but they are heavily invaded by non native species. State Parks has done a commendable job restoring the dunes along their beach. It is hoped that the Navy and state might be able to look at similar dune enhancement on the Navy lands. | NBC Navy will continue to collaborate on these issues with City of Imperial Beach staff through the established military affairs sub-committee meetings. |

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| 318. | Southwest Wetlands Interpretive Association | The City of Imperial Beach is concerned about increased noise levels as operations are enhanced. We urge the Navy to install a 10:00 PM curfew on high decibel activities. Neighbors need their sleep in order to be ready for work the next day. This is a reasonable request in a suburban area. | The Navy considered time and location of training so as to minimize disturbances to the local community, and does its best to conduct noise-producing activities during the day. However, to train in real-world scenarios that may occur overseas, Navy personnel must train at night. Personnel need to train in these dark, late night conditions to ensure that they are prepared for real-world operations. As listed in NBCINST 3502-1, the Navy does notify local public safety agencies and city governments about specific upcoming hazardous or high-visibility night training events so that the local governments may disseminate the information to their communities. Because of this and similar comments, the Navy is evaluating the possibility of extending advanced notification to the neighborhoods of Imperial Beach and Coronado through contact with City offices or the Naval Base Coronado website. |
| 319. | Southwest Wetlands Interpretive Association | In conclusion SWIA suggests an organization like the Management Authority that currently exists at the TRNERR be established on Silver Strand. The Navy has been a member of this body since its inception in 1982. This organizational structure has worked successfully to resolve many issues in a way conducive to carrying out the missions of international, federal, state and county agencies, NGO'S, universities, private contractors and jurisdictions including San Diego County, and the Cities of Imperial Beach and San Diego. It also serves as an important forum for public input and can solve problems in their early stages. SWIA played an important role in helping to formulate the TRNERR Management Authority and would be interested in helping to do the same at the Silver Strand site. | The Navy is a signatory to the referenced MOU for Inter-Agency Trail Coordination Committee. The purpose of the MOU is the establishment of a framework for the coordinated planning, alignment, design, and development of trails inthe Tijuana River Valley. Members of this Committee have no legislative or administrative authority, and act solely in an advisory capacity. Current and future lands owned or leased within the SSTC jurisdiction boundaries are for military purposes. |
| 320. | Sustainable Wildlands United | Vernal Pools<br>While we appreciate the proposed wet season closure of vernal pools, the closure is not sufficient to sustain the resource. The existing policy restricting all activities from vernal pools at all times should be maintained. Dry season impacts from potentially high volumes of foot traffic (12 to 207 individuals per year estimation, DEIS 3.11-43) would result in mortality of the endangered San Diego fairy shrimp. Crushing of fairy shrimp cysts, introduction of invasive weeds as soils are disturbed and changes to watershed hydrological systems would occur relative to patterns of ground impacts. The impacts associated with establishing repetitive seasonal foot traffic are likely to lead to the loss of San Diego fairy shrimp from the site. The USFWS has acknowledged that habitat degradation (and loss) is the greatest ongoing threat to species survival.<br>To achieve effective and real avoidance, please place and maintain barriers that notice and identify vernal pools and their functional watershed within 100 feet, and maintain existing | The Navy will use scheduling and other planning tools to minimize impacts to vernal pools, as listed in the FEIS (Section 3.12 and Section 5) and the signed Biological Opinion (July 7, 2010). This Biological Opinion concluded that, with mitigation measures in place, training activities associated with the Proposed Action would not jeopardize the continued existence of the San Diego Fairy Shrimp.<br><br>The Navy will avoid the occupied vernal pools and their watersheds adjacent to the road at SSTC-S Inland (i.e., pools 1 through 7, marked with flexi-stakes) year-round, to the |

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| | | policy restricting all activities at all times.<br>For any vernal pool that absolutely cannot be avoided, annual baseline surveys should be conducted. In the event of a survey showing a decline in San Diego fairy shrimp from the previous year, activities should be halted until surveys demonstrate recovery to baseline levels. The proposed surveys in five-year intervals are too infrequent to timely detect significant decline. Annual surveys could allow implementation of protective adaptive management measures to attempt recovery. | maximum extent consistent with training needs. The Navy will be completing a Vernal Pool Management and Monitoring Plan to help determine whether the impacts identified in the EIS remain at the low levels expected. The Plan will identify measures to minimize the potential for adverse effects to fairy shrimp from weed abatement, pool restoration, or pool augmentation. The Navy will be establishing the baseline distribution and abundance of San Diego fairy shrimp and the condition of the vernal pool habitat prior to initiating training activities in or around the vernal pools at SSTC-S Inland. The Navy will report monitoring results and any observed incidental take to the USFWS annually, and will adjust management to the vernal pools occupied by San Diego fairy shrimp to minimize any training impacts detected by monitoring. If impacts are more substantial than the low levels anticipated or if impacts could lead to the extirpation of fairy shrimp from any individual pool, then the Navy will reinitiate consultation with the USFWS. |
| 321. | Sustainable Wetlands United | California Least Terns<br>The proposed action has the potential to adversely affect a very substantial portion of the statewide California least tern population. The federally-listed endangered least tern is a noteworthy Endangered Species Act success story in terms of breeding pairs, but it has not fully recovered, and as the DEIS indicates (3.12-18), fledgling rates have remained static or declined in recent years.<br>Unfortunately, the DEIS discusses the effects of the proposed action on least tern recovery primarily in terms of breeding pairs rather than reproductive success. Reproductive success rates should be an additional criterion for determining the significance of the action's impacts. In addition, the EIS should evaluate the potential for the action to contribute to impacts to least terns through increased predation or other indirect effects.<br>Greater noise from operations are likely to reduce nest productivity for least terns and due to temporary and permanent nest abandonment that leaves eggs and chicks vulnerable to predators. The DEIS, however, omits discussion of noise impacts to these sensitive biological receptors. The EIS should analyze and mitigate for this impact.<br>We appreciate the inclusion of avoidance measures in Alternative 1, but remain concerned that the loss of up to 105 least tern nests would represent a significant impact to the species and would impede recovery of the least tern. Additional least tern mitigation or avoidance measures should be incorporated in Alternative 1.<br>Western Snowy Plovers<br>As noted for the least tern, the EIS should evaluate the potential for the action to contribute to | Reproductive success is a metric that is routinely collected by Navy-funded monitors in the Navy's biological monitoring program. The Navy monitoring program is probably more intensive than that of any other agency. Background noise levels are sufficiently high that training activity changes results in non-detectable effects. Considering the current success of least tern and snowy plover, noise is not expected to be an issue.<br><br>The Navy's predator control program is expected to address any increasing complication with predators. Gull-billed tern predation studies are also underway by Navy and other funders (including USFWS), and the Navy has requested approval from USFWS to relocate Gull-billed terns, without success. A species viability analysis is under consideration for funding. The USFWS has not officially proposed the California least tern for downlisting. If and when it does, the proposal will be published in the Federal Register and will be open for public |

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| | | impacts to snowy plovers through increased predation (including predation by least terns) or other indirect effects. In addition, the EIS should include a thorough analysis of the direct and indirect noise effects on snowy plovers, and adopt additional mitigation measures for these impacts. | comment before a final decision is made.<br><br>The Navy is working closely with the USFWS to assist it in addressing gull-billed tern predation and impacts to western snowy plover and California least tern. The Navy has submitted an application for a depredation permit to the USFWS annually since 2005 and has continued to document the impacts from this species. The Navy is supporting a radio-telemetry study by San Diego State University and USFWS during the 2010 nesting season. This study will research movements of gull-billed terns around San Diego Bay and analyze diet through stable isotopes. |
| 322. | Sustainable Wildlands United | Vernal pool habitat on Fanita ranch is for sale. Perfect fit for "readiness and environmental Protection Initiative" | Navy current guidance and policy is to provide required mitigation on Navy lands. The Navy will keep this information on file should required mitigation require an off-site assessment of mitigation. |

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| 323. | United States Department of the Interior | The primary issue of concern is the U.S. Navy's proposal to significantly expand training activities utilizing helicopters at Silver Strand Training Center (SSTC) South. The U.S. Navy's SSTC South is located immediately west of the South San Diego Bay Unit. The Kaufman Drop Zone, which is located in SSTC South, would experience an increase in helicopter activities based on the DBIS. Proposed changes would result in helicopter activities increasing from 724 flights per year to l,262 flights per year with actual landings increasing from 4 lands per year to 40 landings per year.<br>It is not clear from information provided what percentage of helicopter flights and landings would occur in SSTC South as compared to SSTC North. Additionally, specific training exercises (e.g., Tactical Recovery of Aircraft and Personnel and Amphibious Raid) would employ between 5 and 16 helicopters at a given time which may fly over the South San Diego Bay Unit. When approaching from the bay side to land at the Kaufman Drop Zone, helicopters may fly low over the South San Diego Bay Unit.<br>These low-altitude flights have potential to adversely affect Refuge resources (e.g. nesting migratory birds, federally endangered California least tern, and federally endangered western snowy plover).<br>The Service is providing the following recommendations to address concerns presented in this comment letter.<br>I. The Final EIS should include a map depicting anticipated helicopter flight routes and heights at SSTC South. The Service recommends flight routes avoid flying over South San Diego Bay Unit and instead travel to SSTC South along routes that avoid important wildlife areas or via the Pacific Ocean. We believe these alternative flight routes would reduce impacts of expanded helicopter training on South San Diego Bay Unit.<br>2. The Final EIS should describe the San Diego Bay National Wildlife Refuge South San Diego Bay Unit in the Affected Environments section. While the DEIS recognizes the Refuge, significant biological resources within this Unit should be fully described. We recommend the Final EIS provide a thorough analysis of effects resulting from proposed expanded training on Refuge resources (e.g., nesting migratory birds, federally endangered California least tern, and federally threatened western snowy plover). We believe that expanded training activities may affect listed species on the South San Diego Bay Unit and recommend the Navy consult under section 7 of the Endangered Species Act with our Carlsbad Fish and Wildlife Office. | The effort put forth by the Navy to manage the least tern and snowy plover also supports other nesting birds as an incidental benefit. The Navy works each year on site-maintenance and monitoring, plus periodic site enhancement to increase the attractiveness of Delta beaches. The Navy's Proposed Action includes: ongoing nesting site preparation at the Delta Beaches; predator management; population monitoring; a Long Term Habitat Enhancement Plan; and measures to eliminate unauthorized recreational trespass, which are all conservation measures that, while they are not the focus of management, benefit other birds. The Navy expects that the implementation of these conservation measures will maintain the suitability of habitat for all birds within the action area over the long term. The Navy's actions will increase the capacity of oceanside beaches and the Delta beaches to accommodate least terns and snowy plovers, as well as other migratory birds. The South Bay Unit is more fully described in the background resource section, but due to its increased distance from training activities, it is assumed that the magnitude of impact will be less than that reported for areas directly impacted by training activities.<br><br>The Navy has consulted with the USFWS, and received a Biological Opinion (signed July 7, 2010) for take of the listed species associated with military training. Information from the signed Biological Opinion has been integrated into the resource sections, and the mitigation measures are updated as well. This Biological Opinion concluded that, with mitigation measures in place, training activities associated with the Proposed Action would not jeopardize the continued existence of the ESA-listed species.<br><br>A map presenting flight routes will not be added to the FEIS. However, helicopter overflight patterns are described in Section 3.6 for use in the acoustic analysis. |

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| 324. | Vernal Pool Society | Specifically we've noted that present vernal pool sites will be subjected to foot-traffic only during the dry season months; such activity would eventually destroy the dry pool pan and make the necessary accumulation of rain water eventually impossible; the subject here is the survival of vemal pools. Also, vehicular and/or foot-traffic would destroy an intolerable, even though unspecified, percentage of the cyst embryos.<br>We, of course, recognize the need for trained United States Navy personnel; God bless them; however, we believe the proposed Naval Training activities within the Silver Strand Training Complex and southern near shore areas of Naval Air Station North Island expansions (the specific vernal pool subject herewith) will have a NEGATIVE impact on the endangered species which rely on these areas to at least sustain their populations. | Foot traffic entering the pool, as described in the EIS, does not mean troops of people walking back and forth over the pools. The nature of these training activities is dispersed. Each event is more likely to be one traverse over one pool, with a different path each time. The sizes of these pools vary, but they are large relative to the foot traffic, covering a total of 3.2 acres. While harm to cysts is expected and analyzed, the order of magnitude is expected to be a few cysts, compared to an estimated population of tens of thousands if not millions of cysts in these pools.<br><br>The Navy will use scheduling and other planning tools to minimize impacts to vernal pools, as listed in the FEIS (Section 3.12 and Section 5) and the signed Biological Opinion (July 7, 2010). This Biological Opinion concluded that, with mitigation measures in place, training activities associated with the Proposed Action would not jeopardize the continued existence of the San Diego Fairy Shrimp.<br><br>The Navy will avoid the occupied vernal pools and their watersheds adjacent to the road at SSTC-S Inland (i.e., pools 1 through 7, marked with flexi-stakes) year-round, to the maximum extent consistent with training need. The Navy will be completing a Vernal Pool Management and Monitoring Plan to help determine whether the impacts identified in the EIS remain at the low levels expected. The Plan will identify measures to minimize the potential for adverse effects to fairy shrimp from weed abatement, pool restoration, or pool augmentation. The Navy will be establishing the baseline distribution and abundance of San Diego fairy shrimp and the condition of the vernal pool habitat prior to initiating training activities in or around the vernal pools at SSTC-S Inland. The Navy will report monitoring results and any observed incidental take to the USFWS annually, and will adjust management to the vernal pools occupied by San Diego fairy shrimp to minimize any training impacts detected by monitoring. If impacts are more substantial than the low levels |

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| | | | anticipated or if impacts could lead to the extirpation of fairy shrimp from any individual pool, then the Navy will reinitiate consultation with the USFWS.<br><br>The Proposed Action will not all occur immediately, but slowly scale up over time, and only after the baseline condition of the vernal pools has been established and the Vernal Pool Management and Monitoring Plan has been developed and approved by the USFWS. This gradual process will allow the Navy to evaluate the potential impacts, and take corrective action as necessary. |
| 325. | Vernal Pool Society | Under Table ES-2: Summary of Effects 3.11 Birds, there is no way that this statement in regards to "Birds" from Alternative I and/or Alternative II can be relied upon: "...Loss in California least terns nesting would not decrease the nesting total below the 5,722 annual nests to maintain a stable range wide population, and would be below the 2007 incidental take allowance issued by the USFWS...."<br><br>Unforeseen impacts will always occur and the populations will continue to be unable to sustain themselves in the long term. | The levels of impact and overall population of birds is discussed in detail in Section 3.12 of the EIS in support of this statement. The Executive Summary is meant to give a general overview of the EIS, while the detailed discussion of each resource area is provided within the individual sections of the EIS. |
| 326. | Vernal Pool Society | Nor is there any reasonable assumption that the following stated impacts from Tab~ ES-2: Summary of Effects 3.11 Terrestrial Biological Resources under Alternative I and for Alternative II, particularly to Vernal Pool species can be relied upon:<br>" ...• Foot traffic in vemal pool areas could adversely impact individual fairy shrimp. However, impacts would be minimized, due to the low levels of foot traffic that would occur in the pools, and the limitation of those activities to when the vernal pools are dry. Potential impacts to the San Diego fairy shrimp are also associated with emergency vehicle use of unpaved roads in the vernal pool area.<br>• Potential increased training on SSTC<br>•N beach lanes Blue 2, Orange I, and Orange 2 could increase impacts to special status plants and invertebrates in these areas while decreasing impacts at other locations. Some trampling of vegetation at these locations is expected, though the overall effect on non-avian biological resources is expected to be short term and oft moderate intensity due to the potential overlap of concentrated activities in the dunes and upper beach areas. These activities do not pose long term impacts, effects are expected to be temporary and cease at the termination of an activity. | Statements have been made in the Executive Summary of the EIS for the purpose of a cursory overview of the activities and the potential effects. The Executive Summary is meant to give a general overview of the EIS, with the detailed discussion of each resource area provided within the individual sections of the EIS. The detailed discussion about the levels of impact and overall population discussion can be found in Section 3.11 of the FEIS; Terrestrial Biology. New information regarding vernal pools and the restrictions placed upon them (taken from the signed USFWS Biological Opinion with Navy guidance) has been added to Section 3.11 of the FEIS. |

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| | | • Increased foot traffic could cause behavioral impacts to surrounding wildlife, though this effect is expected to be temporary.<br>• Various activities have the potential to impact Brand's phacelia on the beach in the Bravo training area...." | |

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| 327. | Vernal Pool Society | There is no logical reason to assume that the proposed Mitigation measures will negate any impacts which occur despite the Navy's and US Fish & Wildlife Service' best intentions.<br><br>As to the MITIGATION pleading, we have been of the opinion that no such procedure is any longer viable and therefore not even a conceivable solution for requesting any form of vernal pool destruction permit. The vernal pools that have thus far survived the onslaught of civilization's encroachments have already left them with, we believe, less than 1% (one percent) of their original population. These vernal pool creatures are not just Endangered but CRITICALLY ENDANGERED, and ALL vernal pools are to be protected, NONE available to be offered for mitigation. Upon investigation past mitigation attempts are failures.<br><br>The species in question and their necessary, supporting ecosystems which remain today require all the protection we can afford them. They CANNOT accept any further impacts if we wish to have any hope for their continued existence let alone expectations for their Recovery. Therefore, we recommend the NO ACTION ALTERNATIVE. | The Navy will use scheduling and other planning tools to minimize impacts to vernal pools, as listed in the FEIS (Section 3.12 and Section 5) and the signed Biological Opinion (July 7, 2010). This Biological Opinion concluded that, with mitigation measures in place, training activities associated with the Proposed Action would not jeopardize the continued existence of the San Diego Fairy Shrimp. The existing analysis concludes that there will be minimal effects to the vernal pool if training only occurs with foot traffic and only when the pools are dry. However, to further reduce the take potential, the Navy will undertake certain measures. Foot traffic entering the pool, as described in the EIS, does not mean troops of people walking back and forth over the pools. The nature of these training activities is dispersed. Each event is more likely to be one traverse over one pool, with a different path each time. The sizes of these pools vary, but they are large relative to the foot traffic, covering a total of 3.2 acres.<br><br>The Navy will avoid the occupied vernal pools and their watersheds adjacent to the road at SSTC-S Inland (i.e., pools 1 through 7, marked with flexi-stakes) year-round, to the maximum extent consistent with training needs. The Navy will be completing a Vernal Pool Management and Monitoring Plan to help determine whether the impacts identified in the EIS remain at the low levels expected. The Plan will identify measures to minimize the potential for adverse effects to fairy shrimp from weed abatement, pool restoration, or pool augmentation. The Navy will be establishing the baseline distribution and abundance of San Diego fairy shrimp and the condition of the vernal pool habitat prior to initiating training activities in or around the vernal pools at SSTC-S Inland. The Navy will report monitoring results and any observed incidental take to the USFWS annually, and will adjust management to the vernal pools occupied by San Diego fairy shrimp to minimize any training impacts detected by monitoring. If impacts are more substantial than the low levels anticipated or if impacts could lead to the extirpation of fairy |

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| | | | shrimp from any individual pool, then the Navy will reinitiate consultation with the USFWS.<br><br>The Proposed Action changes will not all occur immediately, but slowly scale up over time, and only after the baseline condition of the vernal pools has been established and Vernal Pool Management and Monitoring Plan has been developed and approved by the USFWS. This gradual process will allow the Navy to evaluate the potential impacts, and take corrective action as necessary. |

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| **F.3 PUBLIC HEARING COMMENTS** | | | |
| **IMPERIAL BEACH, CALIFORNIA** | | | |
| 328. | Zeke Mazur | They were talking about having training sessions on the beach, exclusive training sessions. They don't want people around. I think it would be a good idea to have them notify the Union Tribune -- I can't tell if I'm going too fast -- notify and put that on the weather page where they have water temperatures, tide heights and polluted beaches. It would be nice if they had a notice that Silver Strand area is going to be off limits to the public during such and such times. Thank you. | Due to the necessary flexibility inherent in scheduling training activities, it would be extremely difficult to publish notifications in the local newspapers in a timely manner. However, based on your comments and those of others, the navy is investigating various methods by which to notify the public.<br><br>As stated in Section 3.1.2.2.2 and 3.1.2.3.2 of the SSTC EIS, the Navy will not preclude the public from access to public beach adjacent to active training. Active training does not typically occupy the entire stretch of stretch of beach at SSTC-S, but rather one or two training lanes. The public would be able to continue to use public beach adjacent to active training. On SSTC-N there is no public beach. All beaches, including the beach below the high tide line, is leased from the State of California to the Navy for exclusive military use. On SSTC-S, the Navy owns the beach down to the high tide line. The State of California owns the beach below the high tide line. The Navy is adding new mitigation measures for alerting the adjacent communities about events which may be considered intrusive, as well as posting signage and controls about public access to the beaches. |

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| 329. | James Knox | No organization. My name is James Knox. I had submitted these already. I do have some things I'd like to read out loud. One is on 3.5.1.4.2 and 3.5.1.5.2, the Pacific Ocean, about contaminants, report states that most of the contamination of the area is caused by sewage from the river mouth and/or the South Bay ocean outfall. Storm water runoff has a relatively minor influence on local water quality, which is Table 3.5-5 -- will increase training at the south complex, cause more contaminants to reach the ocean by storm water runoff. Rain events occur mainly in the winter when ocean currents in the area are from north to south. Were seasonal changes and ocean water movement taken into account when the finding of contaminants were formulated?<br>The next is 3.5.1.5.2., Pacific Ocean. I believe that the Silver Strand State Beach does have day and overnight use numbers that were not included in this report. I request in the conclusion that the information presented is not representative of the use of the municipal beach in Coronado. The report in other sections extrapolated information that was used for conclusions without complete numbers, and I believe you could have done it for that particular part of the report. The Navy recreational areas, Gator Beach, Fiddler's Cove and so on, I don't believe should be included as recreational opportunities. They have restricted access not open to the general public. So I think you should only include those that the general public could go to. I can't read it all because we have three minutes. | Section 3.5.1.4.2 of the FEIS - For contamination to occur, the contaminants must be present at the surface during a precipitation event, and the surface must be relatively impervious. Residues from the use of flares and smoke grenades constitute the majority of contaminants from training at SSTC. These materials are widely dispersed over the training areas at very low concentrations. Wind erosion of sand and loose surface soils likely results in further dispersal of these materials. When precipitation occurs, most of the rainfall - along with any traces of these residues - infiltrates the soil and sand, and does not run off into the ocean. The potential for increased concentrations of pollutants in waters along the Silver Strand under the Proposed Action is negligible. Seasonal changes in littoral currents along the Silver Strand may affect the dispersal pattern of pollutants from the Tijuana River or from water treatment plant outfalls.<br><br>The EIS states that the use numbers for visitors to SSSB are not representative of the actual use of the ocean waters adjoining the beach. In other words, there is no known correlation between the number of visitors and: (a) the number of individuals that enter the water, (b) how far from the beach those water users travel, (c) the time those individuals spend in the water, and (d) the times of day this use occurs. |

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| 330. | James Knox | 3.6.2.3.2 of .2, new training activities will increase helicopter use. That's the TRAP. It's N9 on Table 2.2. I must disagree with the conclusion the noise level will not change. Each flight is a separate event with individual consequences regarding sound. Weather, temperature, wind direction and pilot skill all contribute to each event.<br>Suggesting that the helicopters will always be in their assigned flight lanes without data is an assumption. The helicopters get out of their flight lanes many times. I've noticed this, and I think training people -- willing to tell you that. Training evolutions may have variations that are not foreseen. This fact needs to be taken into consideration when making conclusions.<br>More use equals more sound in the adjacent residential areas. Citing the ambient sound of the surf supplies no useful data without knowing the size of the surf, the direction of the swell, the direction of strength of wind and the tidal level. None of this information is contained in the table. Thank you. Skip the other ones. Good. I do have a mitigation area I think -- that I think would be nice, and that is to use the north gate if you have more than three vehicles coming to the south complex. Silver Strand is a small kind of windy-to-the-left street, and you will find that the traffic will back up pretty quickly, and they're going in and coming out. Thanks for this opportunity and the assistance of forthright answers that were given to me to my questions and concerns in the open-house portion of this event. Thank you very much. | The analysis of helicopter sound indicates that, while the number of helicopter sorties would increase substantially under Alternatives 1 and 2, the increased frequency of short-term sound exposures from increased helicopter pass-bys would not be sufficient to noticeably change the hourly average sound level at any one off-installation location. This results from the logarithmic nature of sound; a doubling of sound energy results in only a three-decibel increase, which under typical conditions is barely discernable. The analysis of helicopter sound is based upon broadly defined flight paths, consistent with a normal degree of variability introduced by pilot discretion, weather, time of day, and safety concerns such as other aircraft.<br><br>Navy is responsible for traffic on its controlled land. Once personnel leave the base, they are subject to Department of Transportation regulations. Various speed and traffic control measures would be the responsibility of the City of Imperial Beach. Due to this and similar comments, the Navy is considering implementing increased signage or message board requesting Navy personnel to obey all posted speed limits, keep radios turned down, etc., as personnel leave the base.<br><br>The reference to the ambient sound of the surf has been deleted from the FEIS. |

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| 331. | Leon Campbell | Thank you. I represent the Airport Trust. It's a private trust. It has the proprietary interest as a licensee under a U.S. patent issued about a year ago, and briefly, it represents a new airport for San Diego. Not withstanding the fact we spent over 50 years and over $17 million trying to find an alternate site, this is an alternate site. It is feasible, and it will indeed work.<br>I've also met with the FAA in Washington, and they encouraged us to pursue the concept. And briefly, what it is is an airport that would be located within south San Diego Bay, and it would be analogous to an aircraft carrier. It would have a top level for aircraft operations and a lower level for parking, terminal, facilities, et cetera. It would even have an underwater tube for access to and from the shore. The advantages from an environmental standpoint is that it observes water areas completely around it. It is not invading any habitats. It will not cause any excessive noise. The airplanes will be taking off over and across the bay. It does not interfere with air traffic, military or civilian, and basically we've had a lot of good feelings about what we're trying to do.<br>Tonight, I discovered that the airport, for its location, will be invading, if you will, part of the bay area for amphibious training for the so-called quiet-water training, and that would be the delta areas and the echo area.<br>Now, logically, we should find an alternate site for our airport so we're not interfering with that area. Unfortunately, there is no alternate site. We have the only site in San Diego County that's feasible. So we would respectfully ask that an alternate site be generated for at least part of your in-bay amphibious operations.<br>And I think, somehow, we kind of balance the interest so that that can happen. And otherwise, we are very much in favor of what's being done. We think that there's no environmental complex whatsoever between us. And as an incidental benefit, we'd like to create a second entrance to San Diego Bay so that the amphibious base can go ahead and get their vehicles or vessels out into the ocean and back very easily. The airport does respect the amphibious security zones, so we're not involved there. And we're just down to an old-fashioned tradeoff where we think that the alternate site for the amphibious training in-bay, there is no alternate site for a new airport, which incidentally will be billions of dollars for the economy of the South Bay. | As described in Section 2.1 of the EIS, possible alternate locations for training have been explored through criteria that were established to aid in the determination of the feasibility of a site or range for training. Due to a number of factors (training area availability, environmental constraints, proximity to base, etc.), other sites were determined to not be reasonable locations for training; please see Section 2.1.3 of the FEIS. A specific example (for Camp Pendleton) is now provided in the EIS to illustrate why alternate locations are not feasible.<br>Additionally, Chapter 4 of the FEIS addresses the contribution of military training activities to the cumulative impact of all past, present, and reasonably foreseeable future actions. Because this project is still in the conceptual stage, it was not addressed in the cumulative analysis section of the EIS. |

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| 332. | Jeff Foster | I'm a resident of north IB, and so I think that this increase would affect us the most, living up in that area. The increase in activities of shotgun blasts from 150 to 1400, helo sorties from 778 to 2,220, I think. And I guess that, in general, it's a 48 percent increase in sound-generating activities. We definitely will notice that. A lot of them are at night, and it's -- we can hear it. Let's see. I -- so I -- I just implore you to choose the no action alternative. I think that us residents of IB should be considered first and foremost in this decision, because I think we're going to be affected the most. Also, we -- one of the -- one of the most coveted things about IB is the wildlife and the wildlife along the Silver Strand beach adjacent to the south training facility is -- it's really nice down there, and reading this, I can see there's a pretty good impact to that. And I just ask that you choose the no action alternative. Thank you. | The commenter's preference for the No Action Alternative is noted.<br><br>The increase in shotgun breacher training activities would be as described in the comment. Helicopter sorties would increase from 740 per year to 1,673 per year, although most of the helicopter sorties would be in support of over-water training activities rather than land-based training activities. The projected increase in activities at SSTC-S would not translate into a general 48-percent increase in sound exposure of Imperial Beach residents. While helicopter sorties, shotgun breacher training, and amphibious landing exercises on SSTC-S all would increase, they also would occur in various locations at different points in time. The distribution of these activities over time and space is such that the change in the sound environment for any individual resident cannot be quantified. Community noise levels from cumulative helicopter traffic are addressed in Section 4 of the EIS (Cumulative Impacts). |
| 333. | Normandie Trovato-Wilson | I'm Normandie Trovato-Wilson, and I'm here with San Diego Audubon. Some of the concerns Jim is going to be talking about in a little bit, my personal and biggest concern with the increased level of activities is the introduction of training within the vernal pool areas. These are highly sensitive, complex ecosystems, and I have no doubt about the Navy's commitment after speaking with Delphine last night about protecting the western snowy plovers, the Least Terns -- I'll get into that later.<br>But whereas the Navy can very easily barricade off an area around the western snowy plover nest, it's not quite so easy to determine what the impact is going to be once foot traffic is let into the vernal pool areas, and these are ecosystems of which 90 percent have been destroyed in California. An alternative for the vernal pools, since the complex ecological effects seem to be unstudied and unpredictable, would be to maybe phase in some of the training around a vernal pool that is in poor condition and track what happens in that vernal pool. You may have | Foot traffic entering the pool, as described in the EIS, does not mean troops of people walking back and forth over the pools. The nature of these training activities is dispersed. Each event is more likely to be one traverse over one pool, with a different path each time. The sizes of these pools vary, but they are large relative to the foot traffic. While harm to cysts is expected and analyzed, the order of magnitude is expected to be a few cysts, compared to an estimated population of tens of thousands if not millions of cysts in these pools. |

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| | | unexpected results, and it may be better. It could be worse. We don't know. | The Navy will avoid the occupied vernal pools and their watersheds adjacent to the road at SSTC-S Inland (i.e., pools 1 through 7 marked with flexi-stakes) year-round, to the maximum extent consistent with training needs. Foot traffic when the pools are dry consists primarily of small groups. As presented in Section 3.11 of the FEIS, trail forming and soil compaction are unlikely, resulting in no impact to population viability. Additionally, the Navy has completed consultation with the USFWS, and has received a signed Biological Opinion which concludes that proposed training activities will not jeopardize the continued existence of San Diego fairy shrimp.<br><br>As part of the conditions of the Biological Opinion, the Navy will be completing a Vernal Pool Management and Monitoring Plan to help determine whether the impacts identified in the EIS remain at the low levels expected. The Plan will include a focused invasive plant inspection survey in the pools and their watersheds; plant, topographic, hydrological, and water quality surveys (including salinity); and protocol fairy shrimp surveys. In addition, the Navy will be determining the baseline distribution and abundance of San Diego fairy shrimp and condition of the vernal pool habitat prior to initiating training activities in or around the vernal pools at SSTC-S Inland. If impacts are more substantial than the low levels anticipated or if impacts could lead to the extirpation of fairy shrimp from any individual pool, then the Navy will reinitiate consultation with the USFWS. |
| 334. | Normandie Trovato-Wilson | The potential down-listing of the California Least Tern presents a very bad thing in terms of Audubon perspective. We don't really know what the cumulative impact is going to be on both the western snowy plover and the Least Terns. There don't seem to be a real quantification of the sets of numbers. We heard an estimated take number on the high side. We didn't hear one on the low side. There wasn't one in the middle either, and I find that a little concerning.<br>It seems that an option could be to slowly phase in some of these alternatives, such as phasing in the one lane for six months out of the year and seeing how that goes, et cetera. And I didn't see that as part of the plan. And I think that maybe phasing in some of the alternatives and studying the effects could provide the Navy with alternatives to mitigate what may or may not happen. | Modeling was used to estimate mid-range take levels as part of the Biological Assessment on the Proposed Action submitted to the USFWS. It is also expected that a percent of these changes will be implemented over time, rather than all at once. There is no plan to immediately implement the operational changes on the military side. The proposed increases would not occur immediately, and would actually slowly occur over time, similar to the requested phasing. Coupled with the |

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| | | Because as we've known from some of these, many, many, many of these experiments, what happens when we start dealing with these issues is very, very unpredictable. And that's all. Thank you. | Navy's intensive monitoring program, the Navy would be able to continually evaluate the impacts of the Proposed Action on the species.<br><br>The FEIS explains the level of loss anticipated under the No Action Alternative compared to Alternative 1, estimated to be an increase of seven nests, on average, in a typical year for least terns. The difference in incidental take for snowy plover between the No Action Alternative and Alternative 1 is one nest, on average, in a typical year. The Navy will implement a mitigation measure to schedule training in areas where less nesting occurs, when possible, and still meet training needs. In addition, the Navy will schedule training activities that could be conducted on the hardpack during low tides when it is consistent with training needs. The Navy will develop a marking strategy to delineate least tern and snowy plover nesting areas that does not encumber training activities. Such a marking strategy may entail signage affixed to existing beach lane sign posts and a limited number of additional markers, as determined appropriate by Navy staff.<br><br>The extensive monitoring program that the Navy implements has allowed for adaptive management to ensure avoidance and minimization of take, as well as positive contribution to recovery of both species. Nesting activity has increased despite the average historical annual loss of 38 nests (Figure 3.12-9), indicating a capability of the species to not only continue to persist on SSTC, but also to increase, with training occurring in the nesting beaches during the nesting season. Much of this has to do with the Navy's mitigation measures and management practices. Based upon the available data, training activities at historical and proposed levels appear compatible with persistence of the least tern and western snowy plover at SSTC. |

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| 335. | Richard Barck | Richard Barck, and I guess my description would be local resident. I have a couple of thoughts here. And reading through the report -- a lot to read, a lot of work went into that -- some of the things that I would look at from a statistical standpoint are sound levels, which you always describe as average. I assume that means over a 24-hour period?<br>What we're mostly interested in when we live locally and especially at night is how loud it is for very brief periods. If you dampen it out over a day, yeah, it's not very loud, but it's very loud when it happens. For us, especially if we have any doors open facing west, helicopters go by. You cannot hear the TV. In the middle of the night, if you have a few sorties -- and a sortie, as I understand it, contains more than one helicopter in a formation -- they get very loud. They're only there for a few minutes, but if it wakes you up, you don't go back to sleep immediately. And they happen throughout the night. My impression is that many of those flights can be more offshore, because I believe they're not attacking the shore or part of a mission. That would be a comment on that.<br>We have very quiet nights in this area. At night, we hear the surf. We like to hear the surf. We like to have the doors open to do that. We would not like to have to close them to shut out the noise. The second thing is that sometimes there's an offshore breeze. We hear the traffic on I-5 and the trains across the bay. It's quiet down here. We would like that to be maintained.<br>And basically, I am talking about the impact of your Lanes 11 through 14 or your white and purple. I don't know how you'd like to call them. | Time-averaged sound is not always averaged over 24 hours. As explained in Section 3.6.1.2.3 of the FEIS, the equivalent (time-averaged) sound level can be calculated for any meaningful period, but most typically is used for one-hour, eight-hour, or 24-hour periods.<br><br>The equivalent sound level is a widely used sound metric because it allows for the integration of numerous sound sources of differing intensity, duration, and quality, and studies have shown that it correlates well with community reaction to sound. As noted in the comment, however, the equivalent sound level does not adequately express the effects of short-term, or impulsive sounds. For that reason, the Acoustic Environment analysis in the EIS also addresses the effects of impulsive sounds, presenting the peak sound level (dBP) of discrete noise sources such as helicopters, landing craft, munitions, and other typical sources of noise associated with Navy training activities.<br><br>The typical flight pattern in support of SSTC-S inland training consists of an approach along the San Diego Bay flight corridor, turning west on the southern side on Emory Cove, and beginning a descent into SSTC-S, targeting the drop zone to the west of Bunker 99 on the northern end of SSTC-S. Once established in this approach, the helicopters remain at 500 feet over residential neighborhoods and do not reduce their elevation to 150 feet until they are over SSTC-S. On departure, the helicopters ascend to the west over the Pacific Ocean.<br><br>As described in Section 3.6.1 of the FEIS (Affected Environment), a substantial amount of daytime and nighttime helicopter activity occurs in the vicinity of SSTC that is not associated with SSTC training activities. Nighttime helicopter transits from NOLF and NASNI, as well as to and from SSTC-S, occur only over water. The only helicopters overflying residential areas at night are Department of Homeland Security |

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| | | | or U.S. Coast Guard. Information on these flight patterns, as well as the percentage of sorties associated with training at SSTC, has been added to the SSTC EIS document in Sections 2 and 3.6 (Acoustic Environment). Community noise levels from cumulative helicopter traffic are addressed in Section 4 of the EIS (Cumulative Impacts). |
| 336. | Richard Barck | Secondly, been a big effort by local people, as well as Fish and Wildlife and the state parks, to further develop the snowy plover -- western snowy plover nesting areas. Some of those in Silver Strand State Beach south are immediately adjacent to all SSTC south. As I looked at the maps, which are very large scale or small scale that you have on there, it actually appears that you've extended into what was part of Silver Strand State Beach for some of those zones. It is an area that we had good fledglings and nests actively occupied by snowy plovers. Department of Fish and Wildlife has the statistics, and I'm sure they will make it available to you. | The Navy acknowledges the contributions of its agency partners to recover the snowy plover. At Silver Strand State Beach, at least five to nine pairs of plovers have nested each year since 2000. |

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| 337. | John Warner | I have two very serious concerns. For the first, I'd like to go back to December of 2008. There was an F18, left the carrier offshore, developed engine problems. He was instructed by commanders to bypass the open runway at North Island Naval Air Station. He was ordered to attempt a landing at Miramar Marine Air Station. We all know the catastrophe that ensued.<br>My point is that we need hyper-efficient communication, coordination and cooperation between the Navy and the Marines. Commander Perry in the paper today stated we need a very realistic training environment. That would be afforded by the vast wide open spaces in Camp Pendleton, not an area sandwiched between two civilian populations and youth camps. Have I cut off?<br>My second major concern, anybody that's been in this area for a while knows that in the waters out here, we have viral. We have chemical. We have bacterial pollutants that contaminate this water for weeks on end. That's -- in an El Nino cycle, that's magnified. Now that's not to mention the potential catastrophe if Rodriguez Dam fails. The structural integrity of Rodriguez Dam is at question. Built in the early '30s, it would not take much of a man-made or natural event. We've been having a little movement on the earth here recently. I guarantee you it wouldn't take much for Rodriguez to pop, the waters out here to be contaminated for months. Now I've been told one SEAL team member, that's about $200,000 to train that man. That's quite an investment. That's quite a valuable asset. To put that valuable asset in an environment where he is exposed or she is exposed to hepatitis, waterborne pathogens, parasitic amoeba, that is unconscionable. It's negligent. It's reckless.<br>To expand -- yeah, give me the 30.<br>To expand this facility, it may be comfortable and convenient. You may be able to sleep in your beds at night, but I sincerely believe it's compromising the readiness of our troops. Pendleton, that vast area, would provide the opportunity. That's the resource that needs to be explored. Thank you. | San Diego Bay is at the center of a complicated airspace. The Navy has analyzed its flight tracks for safety in the area, as discussed in Section 3.16 of the FEIS. The Navy has determined that risks to the public from rotary-wing aircraft supporting SSTC training are minimal, based on past safety record, low number of flights, and over-water flight paths.<br><br>The Navy strives to be a good neighbor, and analyzed all training activities at SSTC with respect to applicable federal regulations. The location of training has also been explored through criteria that were established to aid in the determination of the feasibility and eligibility of a site or range for training. Due to a number of factors (training area availability, environmental constraints, proximity to base, etc.), Camp Pendleton was determined to not be a reasonable alternative location for training. As described in Section 2.1.3 of the FEIS, the Navy considered, but rejected, alternatives that included moving these exercises to other locations. Such alternatives fail to meet the purpose of and need for the Proposed Action.<br>With regard to failure of Rodriguez Dam and ocean pollution effects on trainees, effects on Navy personnel are beyond the scope of the EIS (which is intended to address effects on the public and environmental resources). |
| 338. | Jim Peugh | I'm the conservation chair of the San Diego Audubon Society. We appreciate the Navy's long-term work to protect the Least Terns and snowy plovers on the strand. And we understand, you know, the desire to have more training operations, but we think you can do it with considerably less impact to the environment.<br>And we'll mention a little bit -- our letter will try to be more specific, but it is interesting that you're working to increase the training capability where, just a few years ago, the Navy was looking to put a golf course on the same area, also in the city of Coronado, which seems ironic. The Least Terns, you know, some of your data shows that the populations are really high. It is important to notice the complementary number, that the reproduction of -- the successful reproduction has been plummeting for the last few years. So Least Terns are not the least bit, you know, in a good position for the future. The purpose of the Endangered Species Act isn't to let species hang on for decade after decade. It's for recovery, and I hope that you'll orient, you know, your actions and your plan to enable the recovery of the Least Tern, and I don't think that the way it is set up it does now. The project -- I understand that -- that -- figuring out | The Navy appreciates the thoughtful comments about modeling; however, there is as much uncertainty about the projected training tempo and locations, given changes in the world situation. Avoidance and minimization measures are proposed to prevent catastrophic losses to species recovery.<br><br>The DEIS was amended to explain the level of loss anticipated of the No Action Alternative compared to Alternative 1, estimated to be an increase of seven nests, on average, in a typical year. The difference in incidental take for snowy plover between the No Action Alternative and Alternative 1 is one nest, on average, in a typical year. The Navy will implement a mitigation measure to schedule training in areas where less nesting occurs, when possible, and still meet |

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| | | what the -- the take impact is difficult, but it just seems like you need to have better quantification of what the take is. You run some models, apparently run worst-case models, and that's really misleading to the public and decision-makers when you're only saying this is the worst case when there's something significantly less than that.<br>You really need to say what the uncertainty intervals in the modeling is. You need to come up with a worst case, an expected value and a best case and -- so people at least know what -- you know, how precise your calculations are. And you don't have that.<br>And the same thing is true of your mitigation measures. The mitigation measures are really kind of fuzzy. They're not mitigation in the sense that I've ever seen before in any other project, and I've reviewed hundreds of EISs and EIRs. You need to be able to quantify what the benefit is going to be to the species, and you really need to show how the difference between the impact and the benefit is going to facilitate the recovery of the species, and I don't -- you know, to me, I don't think you've reached that level. And then as Ms. Wilson mentioned, the services working on -- for some strange reason is working on down-listing the Least Tern, which seems to be the most inappropriate action I've ever heard of. But you need to look to see what the cumulative impact of down-listing will be with your project. | training needs. In addition, the Navy will schedule training activities that could be conducted on the hardpack portion of the beach during low tides when it is consistent with training needs. The Navy will develop a marking strategy to delineate least tern and snowy plover nesting areas that does not encumber training activities. Such a marking strategy may entail signage affixed to existing beach lane sign posts and a limited number of additional markers, as determined appropriate by Navy staff.<br>Finally, The Navy's Proposed Action includes: ongoing nesting site preparation at the Delta Beaches; predator management; population monitoring; a Long Term Habitat Enhancement Plan; and measures to eliminate unauthorized recreational trespass, which are all conservation measures that support the recovery of the least tern. The Navy expects that implementation of these conservation measures will maintain the suitability of least tern habitat within the action area over the long term. The Navy's actions will increase the capacity of oceanside beaches and the Delta beaches to accommodate least terns and snowy plovers. |
| 339. | Jim Peugh | We're really concerned also with the vernal pools. I don't know if you ever had to do trail maintenance, but trails are an increasingly degrading thing. They just go deeper and deeper the more years it's used. I don't know what's going to happen to the contours of vernal pools, but I think that you need to take up a pool, as Ms. Wilson said, and do a lot of experiment over a lot of years before you actually start manipulating.<br>That's the most endangered habitat type in our entire region. And so I just hope that you'll work hard -- and another thing, too, is that the staff so far in their command has been very serious about the environment. But people change, and I want this project to be so they really will protect the environment, not just depending on the personality of who's in charge. | Foot traffic entering the pool, as described in the EIS, does not mean troops of people walking back and forth over the pools. The nature of these training activities is dispersed. Each event is more likely to be one traverse over one pool, with a different path each time. The sizes of these pools vary, but they are large relative to the foot traffic, covering a total of about 3.2 acres. While harm to cysts is expected and analyzed, the order of magnitude is expected to be a few cysts, compared to an estimated population of tens of thousands if not millions of cysts in these pools.<br><br>The Navy will avoid the occupied vernal pools and their watersheds adjacent to the road at SSTC-S Inland (i.e., pools 1 through 7 marked with flexi-stakes) year-round, to the maximum extent consistent with training needs. Foot traffic when the pools are dry consists primarily of small groups. As presented in Section 3.11 of the FEIS, trail forming and soil compaction are unlikely, resulting in no impact to population viability. Additionally, the Navy has completed consultation |

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| | | | with the USFWS, and has received a signed Biological Opinion which concludes that proposed training activities will not jeopardize the continued existence of San Diego fairy shrimp.<br><br>As part of the conditions of the Biological Opinion, the Navy will be completing a Vernal Pool Management and Monitoring Plan to help determine whether the impacts identified in the EIS remain at the low levels expected. The Plan will include a focused invasive plant inspection survey in the pools and their watersheds; plant, topographic, hydrological, and water quality surveys (including salinity); and protocol fairy shrimp surveys. In addition, the Navy will be determining the baseline distribution and abundance of San Diego fairy shrimp and condition of the vernal pool habitat prior to initiating training activities in or around the vernal pools at SSTC-S Inland. If impacts are more substantial than the low levels anticipated or if impacts could lead to the extirpation of fairy shrimp from any individual pool, then the Navy will reinitiate consultation with the USFWS.<br><br>The Proposed Action will not all occur immediately, but will slowly scale up over time, and only after the baseline condition of the vernal pools has been established, and Vernal Pool Management and Monitoring Plan has been developed and approved by the USFWS. This gradual process will allow the Navy to evaluate the potential impacts, and take corrective action as necessary.<br><br>The Navy has established programs to address turn-over in personnel. Any new proposals that may affect listed species would need to be consulted on separately with the USFWS. |

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| 340. | Rina Kelley | I'm not a snowy plover or a fairy shrimp. However, I am an inhabitant. I don't feel also that you have mitigated enough sufficiently for me, being north of Imperial Beach, your mitigation of what you intend to do.<br>I would like to inform you at this time about your lack of attention and the dangerous disregard of your property in Imperial Beach that has put the inhabitants of my city into a dangerous, threatening activity -- subject -- being subjected to your dangerous, threatening activity for years.<br>I would like to put you on notice first that your steel wall outside the Camp Surf fence at the beach has huge holes, serves no purpose except to attract children, has become a serious hazard to the safety of us. Jagged, rusted steel rim and bottom are hazardous on a daily basis. It is an accident waiting to happen for children.<br>Anyway, okay. It's a hazard, anyway. And it's -- for about ten years, it's been a hazard there with holes jagged. So would you have us wait another ten years to remediate and remove it? Hopefully not, that you are now formally put on legal notice with legal effect.<br><br>Camp Surf -- Camp Surf opened onto the street in a residential area for years. You did nothing about it. It ran over the animals on our street, one animal in particular. I called the Navy Chaplin, and the people were distraught. And hit a child in front of my home. It was not -- you did nothing. We are the ones that had to make that camp in the same manner that I just served you with a notice to move that gate to the other end.<br>I want to tell you that this EIS in and of itself is like the nose's camel -- the camel's nose in the tent's door. On SSTC northeast, you do a little bit more -- you could request more activity, permission for an EIS. Then you do it at NASNI. Then you do it in the south where the Navy SEALs are. It's an aggregate effect. The aggregate effect is that, gentlemen, we live in a war zone. I live in a war zone in the summer where Navy SEALs shoot guns and explode munitions outside all night. I can't sleep. Could you please put a time limit on this activity. Your EIS specifically addresses the intensity, the intervals and another thing -- the intervals, the intensity of the activity.<br>We'd like to know the intervals. I'd like to have a -- you know, a timetable so that I can leave town. Also, in addition, the planes that NASNI fly overhead doing these endless, mindlessly seeming exercises -- I was an Air Force officer. I was on Air Force bases. I don't understand how the Navy can destroy a city like this.<br>You shouldn't even be here. This is property that is coveted south shore property in the south -- Southern California, and, you know, I really hope that you could provide us with some timetables at least in mitigation of this. And, you know, go to the Philippines. General MacArthur took care of the Japanese. You don't have to worry about them over there, unless you drive a Toyota | Regarding Camp Surf: issues about Camp Surf are outside of the scope of the EIS, which addresses the Proposed Action. Camp Surf is an area leased by the YMCA from the Navy. Any safety issues regarding the Camp should be brought by the YMCA (the lessee) to the Navy (the lessor). Thank you for alerting Navy to your concern about condition of Camp Surf fence. NBC Planning has prepared a 1391, dated 28 May 2009, for FY 2010 Special Projects Program for repair seawall near Camp Surf.<br><br>With regard to suggestion for timetable, the Navy does not train during a particular time of year or season. As stated in Chapter 1 of the EIS; SSTC is a critical Navy range for west coast naval amphibious, special warfare, and mine countermeasure training activities, and has been used by the Navy for military training for over 60 years. |

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| 341. | Ed Sorrels | I can tell already I'm not going to be a happy speaker for you folks. The captain mentioned -- oh, my name is Ed Sorrels. I'm a Marine veteran. I've lived in Imperial Beach almost 40 years, two different places, one over on Hemlock next to the auxiliary landing field, and now I live on the north side of Imperial Beach. I've heard floating airports. I've heard "I can't sleep at night." I've heard birds and vernal pools and one thing and another. The one thing I haven't heard addressed was, the captain, when he gave his introduction, talked about the importance of realistic training and surviving a combat situation. And there's nobody here yet in this whole group that has addressed the improvement of training, proportioned it to the survival abilities of a marine or a sailor in combat situations.<br>Now, I'm sorry you can't sleep at night. Neither can I. But damn it, that's the sound of freedom. And to -- I'm for option one. There's a sign down here at MCRD over the door of the drill instructor's training facility, and what that sign says is "Let no man's ghost say to me 'If only you had done your job,'" and that applies to all of us now. And that's all I have to say. | As expressed in Chapter 1 of the EIS; the Navy needs to implement its Proposed Action to provide a training environment, with the capacity and capabilities to fully support required training tasks for operational units and military schools—to achieve and maintain the required levels of operational readiness as mandated by Title 10 of the United States Code (USC) 5062. Title 10 requires the Navy to organize, train, equip, and maintain combat-ready naval forces capable of winning wars, deterring aggression, and maintaining freedom of the seas |
| 342. | Van Collinsworth | I'm the conservation -- actually vernal pool conservation director for a coalition of environmental groups. Those include the San Diego Chapter of Sierra Club, the San Diego Audubon Society, Center for Biological Diversity, the California Chaparral Institute, and I'm most known if it involves Santee. I actually live out in Santee. The issue I wanted to most focus on is the vernal pool impacts. And, first, let me say I appreciate the fact you've already acknowledged there's not going to be any activity during the wet seasons. But I am still concerned that the impacts -- the foot traffic during the dry periods would result in mortality of endangered -- the endangered San Diego fairy shrimp.<br>So the best, I guess, opportunity or best route is actually to avoid those vernal pools possibly with some fencing or signage to identify the resource and so there aren't any impacts there whatsoever.<br>Now, the previous speaker made an excellent point about readiness and the importance of training, and we certainly appreciate that. And so if you were to find in your analysis that there couldn't be avoided -- even though we still feel that that foot traffic will create a significant impact, we'd like to see that mitigated elsewhere. Now one of the things I have with me tonight is a map of vernal pools actually that are directly adjacent to Marine Corps Air Station Miramar on Fanuita Ranch. That property is for sale. It has a wealth of vernal pool resources. It's a perfect candidate for the readiness and environmental protection initiative that the military has the buffer program. So I would like to see that given some serious consideration in this EIS and see if that might actually meet the needs for mitigation.<br>Thank you very much. And if I could leave the map? | Foot traffic entering the pool, as described in the EIS, does not mean troops of people walking back and forth over the pools. The nature of these training activities is dispersed. Each event is more likely to be one traverse over one pool, with a different path each time. The sizes of these pools vary, but they are large relative to the foot traffic, covering a total of 3.2 acres. The Navy will use scheduling and other planning tools to minimize avoid impacts to vernal pools, as listed in the FEIS (Section 3.12 and Section 5) and the signed Biological Opinion (July 7, 2010). This Biological Opinion concluded that, with mitigation measures in place, training activities associated with the Proposed Action would not jeopardize the continued existence of the San Diego Fairy Shrimp.<br><br>The Navy will avoid the occupied vernal pools and their watersheds adjacent to the road at SSTC-S Inland (i.e., pools 1 through 7, marked with flexi-stakes) year-round, to the maximum extent consistent with training needs. The Navy will be completing a Vernal Pool Management and Monitoring Plan to help determine whether the impacts identified in the EIS remain at the low levels expected. The Plan will identify measures to minimize the potential for adverse effects to fairy shrimp from weed abatement, pool restoration, or pool augmentation. The Navy will be establishing the baseline distribution and abundance of San Diego fairy shrimp and the condition of the vernal pool habitat prior to initiating training |

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| | | | activities in or around the vernal pools at SSTC-S Inland. The Navy will report monitoring results and any observed incidental take to the USFWS annually, and will adjust management to the vernal pools occupied by San Diego fairy shrimp to minimize any training impacts detected by monitoring. If impacts are more substantial than the low levels anticipated or if impacts could lead to the extirpation of fairy shrimp from any individual pool, then the Navy will reinitiate consultation with the USFWS.<br><br>The Proposed Action will not all occur immediately, but will slowly scale up over time, and only after the baseline condition of the vernal pools has been established, and Vernal Pool Management and Monitoring Plan has been developed and approved by the USFWS. This gradual process will allow us to evaluate the potential impacts, and take corrective action as necessary. |
| 343. | R.G. Head | I'm a resident of Coronado Cays. I've spent a lot of time in Imperial Beach. I have a Bachelor of Science degree in engineering and a Ph.D. in public policy. For the past 20 years, I've worked in the environmental planning industry, and now I'm a private citizen.<br>I've observed tonight's comments are mostly negative with the exception of Ed Sorrels', and I would like to add a few to provide some balance. First of all, naval training is critical. It's absolutely critical to our survival as a country just like it is for the Olympics.<br>In fact, the phases are very similar. Basic training is physical conditioning just like for a ski jumper. Pre-deployment training for combat is indispensable to train young men and women before they go to Iraq and Afghanistan. And thirdly, training between deployments is very important to get new technology, new ideas constantly improved communications. Secondly, training area environmental impact statements are very unique. Training areas, you can't move the area. The area is where it is. I think the 60-year experience of the Navy in this area states for itself that if the training could have been moved to Miramar or to Camp Pendleton, it would have been done so long ago.<br>I'll say something about the ease of which you throw off "use Camp Pendleton." Camp Pendleton's 17 miles of beach are so critically inhabited by endangered species that less than five miles are available for continuous Marine Corps training. They're not going to walk them another 5,000 operations up there. There is no better place for this type of training in the bay and in the ocean than this location.<br>Thirdly, the constraints that are put upon the Navy and the Marine Corps in their training are already immense. Yes, there are environmental issues. Yes, there's public concern over noise and economic impact. But most of the -- some of the speakers that you have seen are single- | Your comment has been noted. |

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| | | issue advocates. They're worried about a vernal pool, or they're worried about the snowy plover. The Navy does not have the luxury to be a single-issue advocate. It is like the rest of us. We are multi-facetted. We have to deal with all the issues at the same time and make tradeoffs. As the Supreme Court -- as the United States Supreme Court ruled in 2008 in "NRDC versus the U.S. Navy," we and the citizens must give adequate attention to the common defense, and that's what I see done in this EIS.<br>Training and environmental stewardship are compatible, and I believe the Navy has achieved a good balance in this set of analysis. Thank you very much. | |

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| 344. | Cindy Buxton | Some of you know me from Mountains and Waterfalls. I've made some observations for stuff. I cannot know all of your point of view. I think that's obvious, so thank you very much for the Navy keeping the good communication over the years. And with all due respect, and I most definitely do, I'm going to make a few observations from my point of view since I have a hard time seeing all of yours. The training has already been very, very effective, and I think we're all very grateful since World War II and Vietnam and Korea and Desert Storm. So I look at the two miles up there as I drive to work every day, and I look at the half mile of particularly critical areas down here, and I go "Why do we really need this?" I don't -- I haven't yet really seen the compelling argument to do some of the things that they want to do. And they talk about the criticality of training and the unique area that -- that area up in Coronado seems to me to be very similar as a beach to this one, the one difference being is that this beach has natural dunes, and it's one of the few places in Southern California where you have a long wide swept area of natural dunes.<br>I moved down here, believe it or not, to Silver Strand and to Imperial Beach specifically because that was such a gorgeous, gorgeous beach. And I certainly do think that we should share our beach where we can or they with us, as you guys are Navy.<br>This town has worked very hard, I've noticed. I thought it was pretty wonderful anyway, though they've worked very, very hard to improve it and improve property values, and I think a lot of heavy artillery will probably compromise that considerably.<br>The one thing I noticed in the EIS was that the camp, Camp Surf, apparently hosts 10,000 children in a year, and I don't think when they originally leased that that they were thinking of a lot of blasting. So what I saw in there was that the Navy holds that property in a fee simple, and I looked this up and noticed that fee simple can be fee differential or circumstantial subsequent, and I'm wondering if there are any extra contingencies on that. The blasting does affect people and children. This is where my dog went through a window one night when she got scared, and I think children would, too. So I would ask you to consider that and modify and attenuate for the birds and the blasting in this area. Thank you. | The Navy must remain committed to training for the safety and security of our country. To do that, the Navy's highest priority is in the protection of our men and women overseas performing their job in defense of our nation. The mission of the SSTC ..." to achieve and maintain the highest level of operational readiness" is discussed in Section 1.4.1 of the EIS and Section 1.5 of the EIS highlights the purpose of and need for training at SSTC. There are many reasons why the Navy needs the SSTC land and nearshore areas to train and why other locations do not fill the need. These alternate locations and training tempos are discussed in Section 2.1.3.<br><br>As described in Section 2.1 of the EIS, possible alternate locations for training have been explored through criteria that were established to aid in the determination of the feasibility of a site or range for training. Due to a number of factors (training area availability, environmental constraints, proximity to base, etc.), other sites were determined to not be reasonable locations for training; please see Section 2.1.3 of the FEIS. A specific example (for Camp Pendleton) is now provided in the EIS to illustrate why alternate locations are not feasible.<br><br>Regarding Camp Surf and SSTC-S, there is no "blasting" at or near Camp Surf and there is no "artillery" use at SSTC. Section 3.12.2.2.4 and Section 3.12.2.3.4 of the FEIS discuss simunition and blank usage at SSTC. The use of live fire is not permitted at SSTC. The simunition and blank usage takes place mostly within SSTC-S bunkers therefore, noise from these activities is considered negligible. |

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| 345. | Shannon Davis | What's on my mind is the fact this is an environmental impact statement. It's a draft. And we're focusing on the environmental issues and NEPA compliance. This is not about patriotism. This is not about being -- protecting our freedom. This is about saving endangered species on critical habitat that maybe apparently should have been paid more attention to by U.S. Fish and Wildlife. And possibly some of these areas should have been sanctioned as refuge, study areas by U.S. Fish and Wildlife to be held under their jurisdiction, not in cooperation with the U.S. Navy. | With implementation of the Proposed Action, losses in California least terns and western snowy plover nesting are expected to be minimally increased from baseline levels. The Navy and U.S. Fish and Wildlife Service (USFWS) have established mitigation measures to compensate for these losses. The Navy has consulted with the USFWS under Section 7 of ESA for the Proposed Action, and received a Biological Opinion (signed July 7, 2010), which concluded that proposed training activities would not jeopardize the continued existence of ESA-listed species. |

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| 346. | Edward Feltis | I'm a resident of Imperial Beach. I've been coming down here since 1960 walking the strand, and this is a single -- single-case issue. I'm not sure exactly how you put it, but single-person issue.<br>Upon reading the impact statement, I noticed that the tide flats are public, and I'm a pretty regular walker. My wife takes me down to Silver Strand. I walk up to the IB pier. I have no problems with -- and according to the statement, most of the training that's going to take place will take place for an hour or two hours, eight hours at the most, things will be posted. I have no problem with walking the beach, running up to a sign that says "Restricted area for the next 48 hours. We're going to be doing this. We're going to be doing that," turn around, walk right back to IB. But my concern is that in 11 through 14, we'll get a sign put up like we had put up two years ago that said "Nobody past this point. This is naval property. You can't walk down to the Silver Strand," and what everybody did was ignore it. If they didn't see anything going on, they ignored it.<br>Readiness training, all part of that. I've got two kids that work -- or live down the hall from me that are in SEAL Team 3, and I want those guys ready, professional and able to do their job whatever it takes. I just want a little assurance that -- on those days when nothing's going on, I want to walk the Silver Strand between the state park and here -- I won't be in any kind of jeopardy or I won't be in the way of any activities. Thank you very much. | As indicated in Section 3.1 of the EIS, restriction of SSTC-S beach areas above the high tide line will continue. Access below the high-tide line would only be restricted during some training activities for either safety or mission security reasons.<br><br>Signs will be revised to clarify that restrictions are only above the high tide line. Personnel will be stationed on either side of training activities to notify recreationists when areas below the high tide line need to be restricted for public safety or security reasons.<br><br>As listed in NBCINST 3502-1, the Navy does notify local public safety agencies and city governments about specific upcoming hazardous or high-visibility night training events so that the local governments may disseminate the information to their communities. Because of this and similar comments, the Navy is evaluating the possibility of extending advanced notification to the neighborhoods of Imperial Beach and Coronado through contact with City offices or the Naval Base Coronado website. |

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| 347. | Ed Sorrels | Okay. Summer of 1957, I was flown in from Hawaii to Camp Pendleton, and I worked all that summer as a lifeguard on the beaches there by Del Mar where they do the Amtrak and rubber boat training for the Marines. And I can assure you of one thing: The environment here on the strand is entirely different than the beach approach environment in Camp Pendleton.<br>You go from water to a very small beach, and then you start inland, and it goes uphill. You don't go from water to beach to water. And it is -- to compare the Silver Strand to Camp Pendleton training areas is apples and oranges. The two don't compare at all. | Your comment has been noted. |
| **CORONADO, CALIFORNIA** | | | |
| 348. | Bill Adams | I'm primarily interested in -- I'm a shore fisherman. I've been shore fishing Coronado beaches since 1949. As a matter of fact, when I was ten years old -- my dad was in the Marine Corps -- I was fishing off the Coronado jetty in front of the hotel in 1943 at age ten. So I know a little bit about shore fishing.<br>Now I'm particularly interested in your Section 3.8, quote, fish. And I'm going to be talking mostly about what we shore fisherman use as bait. Those are called, especially in the summertime, sand crabs. That's the backbone of shore fishing in this area here. On your section references, you talk about -- you have 75 references on 15 -- 15 pages, I think it is.<br>I wrote reports for the Navy for over 30 years. So I was a little surprised when I opened up this document -- a young man earlier explained to me why you're not doing it, but usually when you have a reference, you would have -- if I went to the reference section, it would say in the report what page this came from, or pages. All right. That's not done.<br>It's almost impossible to go through that report and find out where you're talking about. For example, you've got one report dated 1892, some author who wrote something in 1892. I'd like to know what was so important that was required to be in the reference -- 75 references.<br>The other thing that many of us shore fishermen are concerned about, and both the lifeguards in Coronado are well aware of the situation, especially shore fishermen, and that is wheeled vehicles on the beaches. Okay? Now, years ago, when I was on the city council in Coronado, we managed to talk the Navy into getting off the wet part of the sand. That's where the sand crabs are at.<br>But I noticed just recently they're still driving those vehicles on the wet sand, especially at low tide. That's almost a no-no. You're killing the sand crabs. Now, you say there's no long-term effect. Well, I can tell you, as a fisherman, there is. There are no sand crabs on Coronado beach right now. If I go down to Silver Strand, there are sand crabs. If I go down to Imperial Beach by the pier, there are sand crabs.<br>Oh, my God. I guess I'm going to be cut off real short here. Amazing. I don't see how you can have a real impact on a discussion when you only have three minutes. I mean, that's ridiculous. And then tell us, "Oh, by the way, we've got a thick document here," and you want us to respond by March 9th. That is ridiculous, too. And there's only one copy of that report in the Coronado | The reference that you refer to is "Eigenmann, C.M. 1892. The fishes of San Diego, California." This is a reference that speaks towards the long term documentation of fish species that occur in the SSTC area, and is an important baseline for comparison. Considering the sand crab (*Emerita analoga*) has a long planktonic larval phase that implies a high dispersal potential, and coastal water transport is an important factor in determining its local and latitudinal distribution. Extended larval duration allows individuals to colonize new areas with suitable habitats, and is a mechanism to annually restock already existing populations (Tam et al., 1996). Factors such as regional oceanographic dynamics, variations in long shore transport, and local circulation patterns that determine sediment grain size and food supply (they are filter feeders) are what is likely regulating sand crab populations along SSTC beaches.<br><br>The Navy appreciates the public involvement in the NEPA process. In response to requests by the cities of Imperial Beach and Coronado and citizens, the public and agency comment period for the FEIS was extended to March 30th. |

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| | | library.<br>Yeah. Well, I've said my peace. | |
| 349. | Jennifer Blair | My question -- I noticed in the agencies that the California Environmental Quality Act really was not addressed in there, and my specific question is related to noise, and the helicopter noise is the main problem that I'm seeing. I live in the Cays, and I understand we're not talking about the helicopters that are going from -- transporting from Miramar and down to the south end in IB, but you're considering -- I forgot how many sorties that you want to have in addition of the helicopters, and how is that addressing the environmental noise act? That's just a question I have. | The Navy, as the federal action proponent, examines environmental impacts to resources under NEPA. CEQA would not apply, it is only required by a California State public agency when making discretionary decisions.<br><br>With regard to the environmental noise act referenced in the comment, USEPA has authority under the federal Noise Control Act to establish low-noise design standards for commercial aircraft. However, military aircraft are exempted from this federal statute.<br><br>As proposed for Alternatives 1 and 2, up to 1,643 helicopters may be involved with SSTC training events. Approximately 150-200 helicopters per year would fly into SSTC-S inland under Alternatives 1 and 2. The remaining 1,450 to 1,500 helicopter operations would occur offshore in the boat lanes or bay training areas. The most substantial increase in helicopter operations from baseline to Alternatives 1 and 2 would occur with the 386 new MH-60 mine hunting operations, in the western portions of boat lanes.<br><br>As described in Section 3.6.1 of the FEIS (Affected Environment), a substantial amount of daytime and nighttime helicopter activity occurs in the vicinity of SSTC that is not associated with SSTC training activities. Nighttime helicopter transits from NOLF and NASNI, and to and from SSTC-S, occur only over water. The only helicopter overflying residential areas at night are Department of Homeland Security or U.S. Coast Guard. Information on these flight patterns, as well as the percentage of sorties associated with training at SSTC, has been added to the SSTC EIS document in Sections 2 and 3.6 (Acoustic Environment). |

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| 350. | Beverly Dyer | I think it's ludicrous that the Navy has suddenly thrown this upon our public. I want to know how long they have been studying this, why we haven't heard about it before. I know they've been saying they're going to get all this money, and they can do all these things, but did they ever tell any of us that they were going down the strand? None. I have never seen it released until last night, and I didn't have time to write up all of my questions that I have, all the comments that I have.<br>But I have been jotting down different things as you've gone along. But it just doesn't seem right that suddenly we know -- we read about it in the paper, and a lot of people didn't see it in the paper, and there has been very, very little about it on the television. Now that isn't fair. It isn't fair for the Navy to suddenly come in to say "We're doing all these things, and we've done all these things and we've looked up all the environmental necessities and for the project."<br>But why haven't we known? Why haven't they told us if we live here? I live in the Cays. I've lived there 40 years, and I've watched things. I haven't seen any kind of action in that area. In fact, at one time they were going to build a golf course up where you now have buildings on the hill. We used to walk there. There wasn't anything going on there. So -- and suddenly, you've done all these things. You're going to take it over, and there has been very little going on even north of the -- of Silver Strand park where people park right up -- up to the Navy property.<br>But I haven't seen actions going on that far down, and perhaps I missed a few, but I doubt it, because I drive there all the time. And that's another thing that you did not bring up, and that is traffic. The traffic has gotten absolutely horrible because of the Navy, because of North Island. They've been working on that tunnel for North Island, and that's ridiculous because we have -- already have all this traffic coming up from the -- the helicopter base down in Imperial Beach, coming up the strand. They're just continual already.<br>Now you want to do all these other things. You want to save the Navy from having to go far away from their homes. Well, what about the people that live here, that have -- live in Imperial Beach or live in the Cays or live in Coronado? You just add that much more to the people that are here. Even though you keep your people from driving, there are other people that live here, too, and the people that work for the Navy.<br>Thank you. I'm going to also include a letter, so -- later on. Also -- and I agree with the noise and the pollution, you have -- nothing has been said about the pollution in the air that we breathe from the planes going over anything that's on the beach that we get from any of their -- their vehicles and any of the pollution that's in the water. They have the Silver Strand beach there where public comes in and uses up all summer, even in the wintertime, and they use that beach as do the surfers. | Regarding the current activities at SSTC; the southern nearshore areas of NASNI are very large areas, much of them out of the sight of the public. It's very likely that most training activities currently being conducted would not be noticed.<br><br>The Navy is very interested in the contribution of the public to the SSTC EIS. The Navy scoping began at the inception of the SSTC NEPA process in 2001 to open communication with surrounding neighborhoods. The public hearing dates on the Draft EIS were published in local papers, and the Navy requested comments on the document with an extended period for comment on the document. The Navy has remained in contact with the public through the SSTC website as well: www.silverstrandtrainingcomplexeis.com<br><br>As described in Section 2.1.3 of the EIS, the Navy considered, but rejected, alternatives that included moving these exercises to other locations. Such alternatives fail to meet the purpose of and need for the Proposed Action.<br><br>The Navy is aware of the diverse biological community in the area, and has conducted a thorough analysis of potential effects in Chapter 3 of the Draft EIS. The Navy does not dump toxic pollutants into marine areas. Please see Chapter 3 of the FEIS for the description and analysis of potential effects. Chapter 4 includes cumulative analysis of all past, present, and reasonably foreseen future projects by the Navy and non-Navy activities. The Navy has a comprehensive air quality management program. Mitigation measures that are part of the Navy's air quality management practices are implemented at SSTC. Aircraft, marine vessels, ground vehicles, and military equipment are well-maintained, and meet applicable emission standards (such as smog certification for on-road vehicles) in accordance with State requirements.<br><br>The Tunnel Study is known as "State Route 75/282 Transportation Corridor Study" which includes a tunnel |

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| | | | alternative. This study is funded by the City of Coronado. Under Federal transportation authority, Caltrans District 11 has assumed the role of federal Lead Agency for the Draft Environmental Impact Statement (Draft EIS) being developed for the State Route 75/282 Transportation Corridor Study/Project. This local transportation proposal is "owned" by CalTrans and the City of Coronado. The Navy is not the action proponent for the proposal and is participating solely as a Cooperating Agency under the National Environmental Policy Act (NEPA), supplying special expertise on the Draft EIS on federal land use issues affecting NASNI. The scope of this study does not include the portion of State Route 75 south of Naval Amphibious Base.<br><br>A related issue is the implementation of the DoN's Record of Decision (RoD) for the USS VINSON CVN Homeporting Final Supplemental Environmental Impact Statement (Final SEIS). The cumulative Navy traffic impacts studied in this Final SEIS are the same traffic impacts of concern in the State Route 75/282 Transportation Corridor Project Draft EIS as commuters travel on and off NASNI during peak hours each weekday. The RoD proposes to work cooperatively with Caltrans and the City of Coronado. Once a local government agrees to use its jurisdictional authority to take the studied improvements forward, the RoD commits to seek federal funding to implement a series of traffic improvements. These recommended traffic improvements are a suite of local intersection upgrades with the City of Coronado, "Village". |

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| 351. | Normandie Trovato-Wilson | I'm with the San Diego Audubon. I want to thank Captain Lindsey and Delphine and Lewis for hosting again tonight. I have just a few things that didn't come up last night.<br>The first thing was we know that there is anticipated projection in -- an increase in levels of recruitment, and we completely understand that with the level of new recruits that are needed to maintain the fleet readiness. However, if levels drop in the future, we would be interested in including a provision that indicates if for some reason there is complete peace everywhere on earth, for instance, and training levels dropped dramatically, that certain training lanes which are not currently used, if they are used in this future Alternative 1, that they might be phased back.<br>It was brought up last night about peak noise events and how peak noise events might be a helpful statistic to include in the second draft of the EIS as opposed to average noise levels, because if we're talking about peak noise, we can have one really loud peak noise, and then the rest of the day could be quiet, and that would be an average noise level, but that wouldn't analyze the data of the peak noise and how loud it would be. | The increase in training activities is not the only driver for the Navy's proposed training, but also the changes in types of training and platforms, as well as a need for diversity in training. If there is a decrease in training, many of the conditions will tend towards current use because of the natural tendency of training towards training lanes 1-7 and 11-14 (vs. 8-10) as well as a natural tendency towards the northern developed area of SSTC-S (vs. the undeveloped southern areas of SSTC-S).<br><br>Both time-averaged sound levels and peak sound levels are addressed in Section 3.6 of the EIS (Acoustic Environment). For each type of noise event, the appropriate noise metric is used. |
| 352. | Normandie Trovato-Wilson | The other thing that I want to repeat from last night is that the California Least Tern is currently in limbo of being down-listed by the U.S. Fish and Wildlife Service, and that would have a big effect on what would be going on at the SSTC. And just as a side, recovery efforts are often unpredictable and hard to predict what's going on. And there is a commitment, clear commitment by the Navy to maintain the environmental integrity of the SSTC.<br>And it's my personal opinion, not necessarily Audubon's, that maybe some phasing in could be added into the -- the use -- the plans, so maybe trying something, if you see a negative impact, phasing it out. I don't know exactly what the protocol is for that. And it is our hope, from Audubon, that these steps are not towards general reduced protection of wildlife in general, but maintaining of the Navy's commitment to the environmental integrity of the SSTC. | Implementation of increased training tempo and additions of new activities is expected to be phased. The level of protection provided by the Navy is the same for a species listed as Threatened, as opposed to Endangered. Navy programming for natural resources conservation on the Silver Strand will continue. |
| 353. | Gary Trump | Are you going to have an independent study to corroborate what your positions are? Because I think without that, nobody's going to believe you, at least the skeptics won't.<br>The other thing is, we live at the very bottom of the Cays. There's a lot of unburnt fuel from the helicopter passages. There is a lot, and it's all over the patio furniture. It's not thick, but it's there. And if you increase your level of helicopter flights, you're going to increase that, too. | Many of the Navy's actions require regulatory permits from other governmental agencies. As part of the permitting process these agencies conduct independent reviews of the Navy's actions.<br><br>In addition, the Navy has outreached to other organizations throughout the public comment period (e.g., CalTrans and environmental NGOs) to get their feedback on the Navy's assessment.<br><br>The Navy has a comprehensive air quality management program. Mitigation measures that are part of the Navy's air quality management practices are implemented at SSTC. |

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| | | | Aircraft, marine vessels, ground vehicles, and military equipment are well-maintained, and meet applicable emission standards (such as smog certification for on-road vehicles) in accordance with state requirements. |
| 354. | Gary Trump | The other thing is we sit out on the patio quite a bit, and there are times, with your helicopter noise, that we have to stop talking. And I'm quite sure that you don't really want to have that happen in this environment. It's a lovely environment.<br>We came from Los Angeles, and we've never known you people before. We live in the Cays, and there are a lot of people in the Navy there. We love you very much. We're worried about you, and yet I think there are some things about your proposition which probably is not -- I don't think withstand a peer review. So maybe you can think about that. | The typical flight pattern in support of SSTC-S inland training consists of an approach along the San Diego Bay flight corridor, turning west on the southern side on Emory Cove, and beginning a descent into SSTC-S, targeting the drop zone to the west of Bunker 99 on the northern end of SSTC-S. Once established in this approach, the helicopters remain at 500 feet over residential neighborhoods and do not reduce their elevation to 150 feet until they are over SSTC-S. On departure, the helicopters ascend to the west over the Pacific Ocean.<br><br>As described in Section 3.6.1 of the FEIS (Affected Environment), a substantial amount of daytime and nighttime helicopter activity occurs in the vicinity of SSTC that is not associated with SSTC training activities. Nighttime helicopter transits from NOLF and NASNI, and to and from SSTC-S, occur only over water. The only helicopter overflying residential areas at night are Department of Homeland Security or U.S. Coast Guard. Information on these flight patterns, as well as the percentage of sorties associated with training at SSTC, has been added to the SSTC EIS document in Sections 2 and 3.6 (Acoustic Environment). |

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| 355. | Marilyn Field | I'm a Coronado resident, and I'm very concerned about this project. I'm very concerned about the noise impacts and the pollution impacts. The newspaper said there was going to be live fire. I was told tonight there wasn't, but I think it would be good if we understood exactly what was going on. | Chapter 2 of the FEIS describes the components of the activities. The Tables and text in Chapter 2 describe all risks and potential impacts of the activities. No live fire is performed at SSTC. Activities consist of piloting vessels, amphibious vessels, helicopter activities, underwater detonation/mine neutralization activities, BUDs/SEAL training, and physical conditioning training. Activities involving the firing of blanks and pyrotechnics are mostly conducted within SSTC-S. |
| 356. | Marilyn Field | As far as the noise impact, it simply defies credibility that there's going to be no significant increase in noise. It may -- you can do all kinds of things with statistics. You can average it out over a long period, and somebody said you could play all kinds of games with it, but it's simply not credible that this is not going to add to noise in Coronado.<br>This is a small residential community, and you just cannot keep using this as though this is your only training facility. You have other places where people can train. And, yes, it's more convenient here, but you have to balance that against the needs of the small community, and you are very definitely going to be impacting the quality of life here.<br>Already, we have serious impacts of helicopter noise. We live on the other side. We live on the San Diego Bay side, and yet we are constantly, in the summers particularly, affected by helicopter noise so that we can't watch the evening news. We can't have telephone conversations. We can't conduct conversations around the dinner table because the helicopters will come in fleets going south or north on the bay. And they're supposed to stay offshore, but they don't. | Helicopter noise is addressed in Sections 3.6.2.2.1 and 3.6.2.3.2 of the FEIS. The analysis of helicopter sound indicates that, while the number of helicopter sorties would increase substantially under Alternatives 1 and 2, the increased frequency of short-term sound exposures from increased helicopter pass-bys would not be sufficient to noticeably change the hourly average sound level at any one off-installation location. This results from the logarithmic nature of sound; a doubling of sound energy results in only a three-decibel increase, which under typical conditions is barely discernable. The analysis of helicopter sound is based upon broadly defined flight paths, consistent with a normal degree of variability introduced by pilot discretion, weather, time of day, and safety concerns such as other aircraft.<br><br>As described in Section 3.6.1 of the FEIS (Affected Environment), a substantial amount of daytime and nighttime helicopter activity occurs in the vicinity of SSTC that is not associated with SSTC training activities. Nighttime helicopter transits from NOLF and NASNI, and to and from SSTC-S, occur only over water. The only helicopter overflying residential areas at night are Department of Homeland Security or U.S. Coast Guard. Information on these flight patterns, as well as the percentage of sorties associated with training at SSTC, has been added to the SSTC EIS document in Sections 2 and 3.6 (Acoustic Environment). |

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| 357. | Marilyn Field | Now, I'm told that this project did not analyze the helicopters going to and from the training areas. Now that seems to me it's probably a violation of NEPA. Under the National Environmental Policy Act, you're supposed to consider all of the environmental impacts, whether they're remote or anything that's affected by this project.<br>You said you've been working on this since 2001, and yet you've chosen to analyze the helicopter traffic patterns and noise to and from the training area separately. Now that's called segmentation. It's illegal under NEPA. You're supposed to analyze the whole thing, and the public is supposed to have an opportunity to understand and comment on the total effects of the project, not chopped up into little pieces so that it looks benign, but the entire impact of the project. That needs to be done before you proceed here.<br>Secondly, I think the gentleman who just spoke made an excellent idea. I think we do need some independent analysis of your conclusions, because they're simply not credible. And I think it's important to consider the quality of life here and the human element, as well as the wildlife. So I'd like you to think about what you're doing to Coronado. It's not just about the Navy. This is a small community, and we really need to be very aware that you cannot simply continue to load Navy operations here without ruining this small town. | Helicopter noise from the activities of the Proposed Action is addressed in Sections 3.6.2.2.1 and 3.6.2.3.2 of the FEIS. As described in Section 3.6.1 of the FEIS (Affected Environment), a substantial amount of daytime and nighttime helicopter activity occurs in the vicinity of SSTC that is not associated with SSTC training activities. Nighttime helicopter transits from NOLF and NASNI, and to and from SSTC-S, occur only over water. The only helicopter overflying residential areas at night are Department of Homeland Security or U.S. Coast Guard. Information on these flight patterns, as well as the percentage of sorties associated with training at SSTC, has been added to the SSTC EIS document in Sections 2 and 3.6 (Acoustic Environment). Community noise levels from cumulative helicopter traffic are addressed in Section 4 of the EIS (Cumulative Impacts).<br><br>Many of the Navy's actions require regulatory permits from other governmental agencies. As part of the permitting process these agencies conduct independent reviews of the Navy's actions. |
| 358. | Steve Cohan | I just wanted to make sort of a summary statement about my impression of the project. People have talked and brought up some very good points. The impression is that there's going to be a really significant change of impact on the beach. The fact that this process was started in 2001, that now you're -- it was ten years ago and you're now having public hearings, I think that the presentation has tended to minimize what the likelihood is of the impact that it's going to be significant.<br>The people have mentioned these really important areas that really haven't been fully addressed, the impact on wildlife, the noise impact, the possibility of future cutbacks of these operations, legal compliance with preparation of the report.<br>All of these things can't be dealt with, of course, in three minutes, and I'm not prepared to make any technical statement about it, but I think you should take into consideration that the impression of the community is -- is that this is going to be a significant degradation of what is a very beautiful beach, very unusual beach condition in Southern California.<br>There aren't many white-sand beaches that are left that are in the quality condition that it's in. I would just make one further statement that this isn't entirely a problem that I would attribute to the Navy. Having lived around the Navy and watched its operations, including the helicopter operations, the Navy's done a good job, I think, of trying to concern itself with public impact. This isn't entirely the Navy's doing.<br>It has to do, perhaps, with what really is a long-term problem of our poor political leadership out | The Navy is equally concerned with the future of the natural resources, wildlife, and quality of life for all areas of the world the Navy trains. The Navy has analyzed the potential impacts of their training within the SSTC EIS to ensure the future health and beauty of the Silver Strand and surrounding resources. |

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| | | of Washington. Nevertheless, it looks like a very significant degradation of the community. | |

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| 359. | Ron Short | I live in Imperial Beach about a block south of Camp Surf, which is the southern border of your training complex. My concerns are basically the -- sort of like the infringement on our quality of life down there. One is noise. You know, my wife and I were awakened in the middle of the night by live machine gunfire, and I suspect this sort of activity will continue to go on.<br>I would appreciate a heads-up if that's going to be the case. At least we know what to expect. I know when they filmed Transformers II at that complex; they gave everybody in the community some heads-up, so we knew the pyrotechnics and stuff like that was coming.<br>Another concern is the -- perhaps the increase in traffic on Silver Strand Boulevard going to the gate there at the southern end of the complex. You know, I would be -- I would like to know if you anticipate an increase in traffic, because that would also impact the quality of life down there. | The Navy is evaluating the possibility of extending advanced notification to the neighborhoods of Imperial Beach and Coronado through contact with City offices or the Naval Base Coronado website.<br><br>With regard to traffic concerns at SSTC-S; the ADT of Silver Strand Boulevard was taken from the County of San Diego Department of Public Works, 1999. Public Road Standards. Adopted July 14, 1999. This is a public road, and the ADT was calculated for all traffic, which would include any military traffic. The FEIS used these ADT amounts to determine the contribution to overall traffic on public roads from military activities. In lieu of funding an additional ADT study, this was assumed to be an appropriate method for determining military contribution to overall traffic.<br><br>As previously discussed, traffic volumes were not available for Silver Strand, the roadway that provides access into SSTC-S; however, based on the County of San Diego Public Road Standards, typical roadway capacity for a residential street operating at a LOS C is 1,500. The assumption is that without an ADT, the roadway is operating at this typical capacity. Section 3.14.2.2.1 states that the current level of trips associated with military activities is 147 into SSTC-S. As stated in Section 3.14.2.3.1, the increase in ADT from the NAA and the PA will be 102 (147 to 249). This will increase the overall ADT (assuming operation at normal capacity for a residential street at "C") to 1602, which represents a 6.8 percent increase in ADT. |

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| 360. | Judy Haims | I agree with the noise. That is a tremendous issue. You have no idea how much noise is generated down there. I've been there for 18 years. You -- the paper says that you have like 150 -- 150 sessions, and they're going to go up to 700-and-something. That's not a small increase.<br>And they talk about the decibel level. It's ingenuous to say the decibel level may stay the same. It may stay the same, but the amount and time and duration for the extra 550 sorties that you're going to have is tremendous, and that needs to be addressed.<br>And also, the strand -- the Silver Strand is used tremendously all year long by campers. It's going to affect these people who don't have the opportunity that we do to live in Coronado. And this has just been too fast and too soon. You may have known about it, but the people who live here and enjoy this way of life are not aware or have not been until now. | Helicopter noise is addressed in Sections 3.6.2.2.1 and 3.6.2.3.2 of the FEIS. As described in the EIS, approximately 80 percent of the helicopter flight time associated with training activities at SSTC occur over water rather than over land, and because these aircraft fly offshore during transits between NASNI and SSTC, very little of this helicopter activity occurs over developed urban areas. As described in Section 3.6.1 of the FEIS (Affected Environment), a substantial amount of daytime and nighttime helicopter activity occurs in the vicinity of SSTC that is not associated with SSTC training activities. Community noise levels from cumulative helicopter traffic are addressed in Section 4 of the EIS (Cumulative Impacts).<br><br>The FEIS addresses noise impacts on Silver Strand State Beach in Sections 3.6.2.2.1, 3.6.2.2.2, 3.6.2.2.3, 3.6.2.2.4, 3.6.2.2.6, and 3.6.2.3.7. Noise effects on public use of the beach are specifically addressed. |
| 361. | Shannon Davis | One issue that has not been addressed on the south end of the project at Radio Receiving Facility is ambient lighting. I have driven down the strand in the middle of the night and seen lights on that were way too bright, and I have concern for the endangered species there and how that ambient lighting would affect the birds.<br>And I'm also very concerned about the fact that you mentioned that you may want to take 200 men in a year's time of foot traffic through the vernal pools when they're dry. And you must understand that that is a very delicate ecotone. Some of it -- some of the vernal pools took thousands of years to come into the making, and there are sediments there that can be irrevocably destroyed.<br>The eggs, though they are dormant and dry, come alive when the rain season comes. But they can be there for years without any activity there. And I'm concerned as to why you wouldn't fence those vernal pools and keep them in and the foot traffic out of there. So that's very much a concern.<br>Also, I would have liked to have seen some studies included from U.S. Fish and Wildlife and from your biologist on the populations of the San Diego fairy shrimp. I would like to see if there are any other species in the vernal pools, if there is any possible genetic corruption from another species there.<br>There was a study done by a Dr. Marie Sinedich S-i-n-e-d-i-c-h. She got her doctorate. In 2004, she did a study in all the vernal pools here in San Diego County, and she did it in cooperation with U.S. Fish and Wildlife, and the vernal pools at the Radio Receiving Facility were not included. And I -- my question is: Did the Navy not cooperate in those studies, and why wasn't that included in that inventory and in that study? | Ambient lighting impacts are not known, except to say that many of the nests are below the crest of the beach so car lights may not reach nesting birds. Lighting from facilities is set back and points away from beaches. The success of nesting fledging points to a potentially negligible effect of lighting. The Navy routine cooperates with local universities in research by way of cooperative agreement.<br><br>The potential loss of vernal pool fairy shrimp will be minimized by avoiding the pools while they are dry. The nature of foot traffic entering the vernal pool area is dispersed. Each event is more likely to be one traverse over one pool, with a different path each time. The sizes of these pools vary, but they are large relative to the foot traffic, covering a total of 3.2 acres. While harm to cysts is expected and analyzed, the order of magnitude is expected to be a few cysts, compared to an estimated population of tens of thousands if not millions of cysts in these pools. |

| # | Name or Organization | Comment | Response |
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| | | And also, I would like to alert you to the fact that there is a steady decline in the endangered fairy shrimp and that they could go extinct if you have foot traffic in there. You could do irrevocable damage. | The Navy will avoid the occupied vernal pools and their watersheds adjacent to the road at SSTC-S Inland (i.e., pools 1 through 7 marked with flexi-stakes) year-round, to the maximum extent consistent with training needs. Foot traffic when the pools are dry consists primarily of small groups. As presented in Section 3.11 of the FEIS, trail forming and soil compaction are unlikely, resulting in no impact to population viability. Additionally, the Navy has completed consultation with the USFWS, and has received a signed Biological Opinion which concludes that proposed training activities will not jeopardize the continued existence of San Diego fairy shrimp.<br><br>As part of the conditions of the Biological Opinion, the Navy will be completing a Vernal Pool Management and Monitoring Plan to help determine whether the impacts identified in the EIS remain at the low levels expected. The Plan will include a focused invasive plant inspection survey in the pools and their watersheds; plant, topographic, hydrological, and water quality surveys (including salinity); and protocol fairy shrimp surveys. In addition, the Navy will be determining the baseline distribution and abundance of San Diego fairy shrimp and condition of the vernal pool habitat prior to initiating training activities in or around the vernal pools at SSTC-S Inland. If impacts are more than the low levels anticipated or if impacts could lead to the extirpation of fairy shrimp from any individual pool, then the Navy will reinitiate consultation with the USFWS.<br><br>The Proposed Actions will not all occur immediately, but will slowly scale up over time, and only after the baseline condition of the vernal pools has been established, and Vernal Pool Management and Monitoring Plan has been developed and approved by the USFWS. This gradual process will allow the Navy to evaluate the potential impacts, and take corrective action as necessary. |

| # | Name or Organization | Comment | Response |
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| | | | The Navy has established programs to address turn-over in personnel. Any new proposals that may affect listed species would need to be consulted on separately with the USFWS. |
| 362. | Vicki Lambert | I'm a resident here in Coronado. We've talked a little bit about traffic mainly on the strand, but I live here in the village. And I can only see -- or foresee that traffic across the bridge and down Orange on 75 is going to increase with the number of people that are going to come from their homes in the San Diego area to do their training here. And I don't know if that has actually been -- that level of increase has been taken into account in the city planning. And with the tunnel discussions that we've been having, we need to also look at how we would deal with that increase along with our new carriers coming in. So thank you. | Proposed increases in training would not result in a direct increase in traffic on the bridge or on Orange Avenue. Future traffic increases have been accounted for, and are analyzed in the Transportation Section. |

| # | Name or Organization | Comment | Response |
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| 363. | Judy Haims | What other sites could you use, and have you thought of other sites to use? Has there been a choice, or you just haven't told us that there was choices? And the thing that comes to my mind is what about using Camp Pendleton or renting the area from Pendleton or doing some kind of a swap or something, because you're going to have your beaches, you're going to have your landings, and you don't have the city with the quality of Coronado right in the middle of Pendleton. | The Navy strives to be a good neighbor, and analyzed all training activities at SSTC with respect to applicable air and water regulations. As described in Section 2.1 of the EIS, possible alternate locations for training have been explored through criteria that were established to aid in the determination of the feasibility of a site or range for training. Due to a number of factors (training area availability, environmental constraints, proximity to base, etc.), other sites were determined to not be reasonable locations for training; please see Section 2.1.3. A specific example (for Camp Pendleton) is now provided in the EIS to illustrate why alternate locations are not feasible. |

# Appendix G
# Agency Consultation

# APPENDIX G
# AGENCY CONSULTATION

The Navy has consulted with regulatory agencies as appropriate during the National Environmental Policy Act (NEPA) process and prior to implementation of the Proposed Action to ensure requirements have been met. The following is a list of the Silver Strand Training Complex (SSTC) regulatory agency consultation documentation. Agency correspondence and supporting documentation can be found on the SSTC EIS website at www.silverstrandtrainingcomplexeis.com.

California Coastal Commission, Coastal Zone Management Act

- U.S. Navy, May 2010. Final Silver Strand Training Complex Consistency Determination.
- California Coastal Commission, August 17, 2010. Coastal Consistency Determination Conditional Concurrence Letter.
- U.S. Navy, November 23, 2010. Final Coastal Consistency Determination Notification Response Letter.

National Oceanic and Atmospheric Administration - National Marine Fisheries Service, Magnuson-Stevens Fishery Conservation and Management Act

- U.S. Navy, March 2010. Essential Fish Habitat Assessment for the Silver Strand Training Complex Environmental Impact Statement.
- National Marine Fisheries Service, October 13, 2010. Essential Fish Habitat Assessment consultation letter.
- U.S. Navy, November 10, 2010. Essential Fish Habitat Assessment consultation response letter.

U.S. Fish and Wildlife Service, Endangered Species Act

- U.S. Navy, September 2008. Programmatic Biological Assessment for the Silver Strand Training Complex.
- U.S. Fish and Wildlife, July 7, 2010. Biological Opinion (FWS-SDG-08B0503-09F0517) on the U.S. Navy's Silver Strand Training Complex Operations, Naval Base Coronado, San Diego, CA.

National Oceanic and Atmospheric Administration - National Marine Fisheries Service (Endangered Species Act

- U.S. Navy, March 2010. Request for Endangered Species Act Section 7 consultation on green sea turtle at SSTC.
- National Marine Fisheries Service, November 19, 2010. ESA informal consultation concurrence letter for the green sea turtle.

National Oceanic and Atmospheric Administration - National Marine Fisheries Service, Marine Mammal Protection Act

- U.S. Navy, September 2010. Incidental Harassment Authorization Application for Navy Training Conducted within the Silver Strand Training Complex (replaces original IHA application submitted February 2010).
- National Marine Fisheries Service, October 19, 2010. Notice of Receipt of Incidental Harassment Authorization published in the Federal Register (75 FR 64276 - 64295).

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RECORD OF DECISION

ISSUANCE OF A MARINE MAMMAL PROTECTION ACT (MMPA) AUTHORIZATION TO TAKE MARINE MAMMALS INCIDENTAL TO U.S. NAVY TRAINING ACTIVITIES IN THE SILVER STRAND TRAINING COMPLEX

Supported by: U.S. Navy Silver Strand Training Complex Final
Environmental Impact Statement
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
Office of Protected Resources
Silver Spring, Maryland

In accordance with the National Environmental Policy Act (NEPA) and its implementing regulations and NOAA's Administrative Order 216-6 Environmental Review Procedures for Implementing the National Environmental Policy Act, this document comprises the National Oceanic and Atmospheric Administration's (NOAA) National Marine Fisheries Service's (NMFS) Record of Decision (ROD) for issuance of an incidental harassment authorization (IHA) pursuant to section 101(a)(5)(D) of the Marine Mammal Protection Act (MMPA; 16 U.S.C. 1361 *et seq.*) to the U.S. Navy (Navy) for the taking of marine mammals incidental to the conduct of specified activities in the Silver Strand Training Complex (SSTC).

## I. INTRODUCTION

On March 3, 2010, NMFS received an application for an IHA under the MMPA from the Navy to take California sea lions (*Zalophus californianus*), Pacific harbor seals (*Phoca vitulina richardsi*), bottlenose dolphins (*Tursiops truncates*), and gray whales (*Eschrichtius robustus*) incidental to its proposed training activities at SSTC in Southern California. After addressing comments from NMFS, the Navy modified its application and submitted a revised application on September 13, 2010. Further revisions of the IHA application were made by the Navy on November 4, 2010, to clarify issues concerning zones of influence calculation resulting from underwater detonation and pile driving during the comment period; and on December 28, 2010, in response to the Marine Mammal Commission's recommendation of post-pile driving monitoring after the comment period. No changes were made for the Navy's proposed action and no changes of potential impacts to marine mammals from what were initially analyzed.

NMFS' issuance of MMPA authorization to the Navy governing the incidental take of marine mammals is a Federal action for which NMFS is responsible for analyzing the effects on the human environment pursuant to NMFS' NEPA procedures. NMFS participated as a cooperating agency in the development of the Navy's Environmental Impact Statement (EIS), which contained an analysis of the effects of the Navy's activities on the human environment. NMFS worked closely with the Navy to provide information in NMFS' area of expertise to support the EIS' effects analyses for endangered species, marine mammals, and other marine resources. In accordance with the NEPA regulations at 40 CFR 1506.3, NMFS analyzed the Final EIS and concluded that NMFS' comments and suggestions on the EIS have been addressed. NMFS adopted the Navy's EIS in February 2011.

A. NAVY PROPOSED ACTION

The Navy has prepared a final Environmental Impact Statement (EIS), titled, "*Silver Strand Training Complex Environmental Impact Statement*" (hereinafter, "EIS"), for the proposed training activities. As the lead agency, the Navy proposes to support and conduct training exercises at the SSTC. As described in the EIS, the purpose of the Navy's proposed action is to improve the availability and quality of training opportunities at SSTC – to achieve required levels of operational readiness. In order to meet training requirements, the Navy proposes to continue current training activities, increase training tempo and types of training, conduct existing routine training at additional locations within SSTC's established training areas, and increase access to and availability of existing beach and inland training areas.

The Navy states that the proposed action is needed to provide a training environment consisting of training areas and range facilities with the capacity and capabilities to fully support required training tasks for operational units and military training units / schoolhouses and meet the operational readiness requirements of Title 10 of the United States Code (USC) 5062. The Navy needs to

- continue current training and increase the number of existing training activities and introduce new training activities and platforms in support of Fleet Readiness Training Plan (FRTP) and surge requirements;

- provide assured year-round access and unencumbered use of training areas to meet current and future training needs per the Navy Tactical Task List;

- provide a training range and training facilities that afford operational commands the flexibility to achieve diverse and realistic training at SSTC.

The Navy has been training and operating in the SSTC for over 60 years. The land, air, and sea spaces of the SSTC have provided, and continue to provide, a safe and realistic training environment for naval forces charged with defense of the Nation.

The following discussion describes the underwater detonation training and pile driving conducted at SSTC. Other training events conducted at SSTC, which are not anticipated to rise to the level of harassment to marine mammals as defined under the MMPA, are more completely described in the SSTC Final EIS.

*Underwater Detonations*

Underwater detonations are conducted by Explosive Ordnance Disposal (EOD) units, Naval Special Warfare (NSW) units, MH-60S Mine Countermeasure helicopter squadrons, and Mobile

Diving and Salvage units at the SSTC. The training provides Navy personnel with hands-on experience with the design, deployment, and detonation of underwater clearance devices of the general type and size that they are required to understand and utilize in combat. EOD groups conduct most of the underwater detonation training at SSTC as part of their training in the detection, avoidance, and neutralization of mines to protect Navy ships and submarines, and offensive mine laying in naval operations.
For safety reasons, underwater detonation training only occurs during daylight and can only be conducted in sea-states of up to Beaufort 3 (presence of large wavelets, crests beginning to break, presence of glassy foam, and/or perhaps scattered whitecaps).

*Elevated Causeway System (ELCAS) Training*

Elevated Causeway System (ELCAS) is a modular pre-fabricated causeway pier. ELCAS provides a link between offshore amphibious supply ships with associated lighterage (i.e., small cargo boats and barges) and the shore by bridging the surf zone. Offloaded vehicles and supplies can be driven on the causeway to and from shore. During ELCAS training events, 24-inch wide hollow steel piles are driven into the sand in the surf zone with an impact hammer. At the end of all the ELCAS training, a vibratory hammer attached to the pile head will be used to remove piles by applying a rapidly alternating force to the pile by rotating eccentric weights about shafts, resulting in an upward vibratory force on the pile.

B. NMFS' MMPA DECISION AUTHORITIES

Sections 101(a)(5)(A) and (D) of the MMPA direct the Secretary of Commerce (Secretary) to allow, upon request, the incidental, but not intentional taking of marine mammals by U.S. citizens who engage in a specified activity (other than commercial fishing) during periods of not more than five consecutive years if certain findings are made and regulations are issued or, if the taking is limited to harassment and of no more than one year, the Secretary shall issue a notice of proposed authorization for public review.

As described in the Navy's March 3, 2010, application and associated November 4 and December 28, 2010, updates to that request, the specified Navy activities to be conducted in the SSTC are expected to take marine mammals as defined by the MMPA, and the Navy requested incidental take authorization in accordance with Section 101(a)(5)(D) of the MMPA. In order to issue the IHA under this section, NMFS must make the determination that the specified activities will result in a negligible impact on the affected species or stocks and not result in an unmitigable adverse impact on the availability of marine mammal species or stocks for taking for subsistence uses (note that no subsistence use issues have been identified in the SSTC). In addition, NMFS, as part of its regulatory process, is required to prescribe the permissible methods of taking, the means of effecting the least practicable adverse impact on the species or stock and its habitat (i.e., mitigation) and to set forth requirements pertaining to monitoring and reporting of such taking.

NMFS has defined "negligible impact" as "an impact resulting from the specified activity that cannot be reasonably expected to, and is not reasonably likely to, adversely affect the species or stock through effects on annual rates of recruitment or survival." (50 C.F.R § 216.103).

The National Defense Authorization Act (NDAA) (Public Law 108-136) amended the MMPA, removing the "small numbers" and "specified geographical region" limitations and amending the definition of "harassment" as it applies to a "military readiness activity" to read as follows (Section 3(18)(B) of the MMPA):

(i) any act that injures or has the significant potential to injure a marine mammal or marine mammal stock in the wild [Level A Harassment]; or

(ii) any act that disturbs or is likely to disturb a marine mammal or marine mammal stock in the wild by causing disruption of natural behavioral patterns, including, but not limited to, migration, surfacing, nursing, breeding, feeding, or sheltering, to a point where such behavioral patterns are abandoned or significantly altered [Level B Harassment].

The MMPA also contains a provision related to "military readiness activities" that requires NMFS, when making a determination of "least practicable adverse impact on such species or stock" to consider personnel safety, practicality of implementation and impact on the effectiveness of the military readiness activity. Before making the required determination, NMFS must consult with the Department of Defense regarding the mitigation measures and their effect on the aforementioned factors.

## II. NMFS' DECISION AND FACTORS CONSIDERED IN THE DECISION

Alternative 1 of the Navy's EIS fully meets the purpose and need of the Proposed Action as this Alternative provides the Navy the ability to support U.S. Navy and Marine Corps amphibious, special warfare, and mine countermeasure training by providing local land, sea, and airspace support services; material; and training facilities that will help Naval and Marine Corps forces achieve and maintain the highest level of operational readiness. Therefore, NMFS selected Alternative 1 as the Preferred Alternative.

### A. The Decision

NMFS' decision is to issue a one-year IHA for the take of marine mammals incidental to specified activities described in Alternative 1 (preferred alternative) of the Final EIS, and the action presented to NMFS in the Navy's March 2010 application and November and December 2010 updates. The IHA will allow the take of marine mammals incidental to the Navy's training activities conducted at the SSTC for the period of March 2011 through March 2012. Alternative 1 of the Final EIS includes an analysis of all of the activities for which the Navy has requested incidental take authorization pursuant to the MMPA. The IHA will prescribe the permissible methods of taking, the means of effecting the least practicable adverse impact on the species or stock and its habitat (i.e., mitigation), and will set forth requirements pertaining to monitoring and reporting of such taking for the specified activities, as described in Alternative 1.

The Navy will be authorized to take individuals of 4 species of marine mammals by Level B harassment incidental to training activities in the SSTC. NMFS will issue an IHA that authorize the takes.

B. FACTORS CONSIDERED IN REACHING THE DECISION

The EIS discusses the affected environment and environmental consequences in Chapter 3, within subsections arranged by Resource type, including: land use and recreation; geology and soils; air quality; hazardous materials and waste; water resources; acoustic environment (terrestrial); marine biological resources; fish; marine mammals; sea turtles; terrestrial biological resources; birds; cultural resources; transportation and circulation; socioeconomics, environmental justice, and protection of children; and public health and safety. The Marine Mammals subchapter (3.9) contains the majority of the analyses that relates to NMFS' action of issuing the IHA. Other sections of the EIS contain analyses related to potential impacts on marine mammal habitat and further support NMFS' proposed issuance of the IHA. In addition, Chapter 4 provides an assessment of potential cumulative impacts, including analyzing the potential for cumulatively significant impacts to the marine environment and marine mammals.

Within the Environmental Consequences chapter (Chapters 3), the Navy's EIS addresses potential impacts from underwater detonation and pile driving and removal. The sections in the chapter describe in detail the acoustic thresholds that NMFS uses to indicate at what received sound levels marine mammals will be considered taken pursuant to the MMPA. The EIS also describes in detail the analytical framework and model that the Navy uses to estimate take, based on NMFS' acoustic thresholds. Last, the Navy presents estimates (for each alternative) of the number of each species of marine mammal that will be exposed to levels of sound that NMFS has determined will result in Level A and Level B harassment. The Navy uses these take estimates, combined with the other information included in Chapter 3 to conclude that none of the alternatives will result in any adverse population level effects on any of the affected species or stocks. The take estimates for the Navy's preferred alternative are the subject of the Navy's request to NMFS for MMPA Section 101(a)(5)(D) authorization.

As described above, the environmental consequences to the marine environment are of particular importance for NMFS' evaluation in reaching the decision to issue MMPA incidental take authorizations. In particular, because NMFS' action is specific to authorizing unintentional take of marine mammals, the key factors considered in the decision are related to NMFS' statutory missions under the MMPA. The primary documents supporting this decision are the Navy's Silver Strand Training Complex Final EIS.

As a cooperating agency, NMFS assisted the Navy by providing technical information to evaluate the effects of the training activities on marine mammals and their habitat. Via the MMPA process, NMFS reviewed the Navy's request to determine whether the total taking resulting from the activities would have a negligible impact on the affected species or stocks of marine mammals, would not have an unmitigable adverse impact on the availability of those species or stocks of marine mammals intended for subsistence uses, and that the permissible methods of taking and requirements pertaining to the mitigation, monitoring and reporting of such takings are set forth. As supported by the Final EIS, NMFS has made the requisite findings under the MMPA and will include these findings in a final rule.

Key relevant factors considered by NMFS in this decision include:

- Mitigation and Monitoring. As noted above, for military readiness activities, NMFS is required to consider personnel safety, practicality of implementation, and impact on the effectiveness of the military readiness activity when it makes its determination of "least practicable adverse impact". Chapter 5 of the EIS discusses the Navy's approach to mitigation and monitoring and describes specific mitigation measures that would be implemented to protect marine mammals, sea turtles, and other resources during training activities.

- Approach to assessments. NEPA and MMPA involve differing approaches to assessing effects on those resources considered under each statute, and this combination of analyses provides a robust basis for the decision on this action. The Final EIS and IHA for the SSTC activities present the assessments in detail, but a few salient issues and difference are highlighted here. First, the EIS includes analysis of the significance of the Navy activities on marine mammals. In the EIS, the term "significance" is as commonly used in NEPA, without additional definition of significance related to marine mammals. As described earlier, the MMPA uses the term "negligible impact" (defined above). For this ROD, the EIS evaluation of the significance of impacts to species was considered as input to NMFS' MMPA assessments; this decision is supported by the EIS and also reached based on NMFS statutory responsibilities under the MMPA.

## III. OTHER ALTERNATIVES CONSIDERED

The alternatives analyzed in the Navy's EIS and their relationship to the NMFS' alternatives are described below. NMFS' proposed action (issuance of an IHA) would authorize take of marine mammals incidental to a subset of the activities analyzed in the Navy's SSTC EIS that are anticipated to result in the take of marine mammals, i.e., those activities that involve underwater detonations. Thus, these activities are the subject of NMFS' proposed MMPA regulatory action. The Navy's EIS contains a thorough analysis of the environmental consequences of their proposed action (with specific sections underwater detonations) on the human environment, including a specific section on marine mammals.

### A. Summary of the Alternatives Considered by the Navy

The alternatives were developed by the Navy after careful assessment by subject-matter experts, including units and commands that utilize SSTC, Navy environmental managers and scientists, and the consideration of public comments received during scoping. The Navy has developed a set of criteria for use in assessing whether a possible alternative meets the purpose of and need for the proposed action:

1. Must meet the requirements of individual and unit-level training;

2. Must have sufficient available and suitable training space to simultaneously accommodate the training needs of all of the operational users so that they can achieve training tempo requirements based on Fleet deployment schedules;

3. Must meet future training requirements with year-round, assured access to San Diego Bay, ocean, beach, and inland training areas;

4. Must provide a realistic training environment that simulates real world littoral combat conditions and is free of man-made restrictions/objects that interfere with preparing servicemen for operations in real-world conditions;

5. Must complete the full range of required training elements at SSTC;

6. Must provide co-location with commands, equipment, facilities, and infrastructure on Naval Amphibious Base (NAB) Coronado that support existing and future training and meet training and personnel tempo requirements.

Three alternatives are analyzed in the EIS: (1) The No Action Alternative, (2) Alternative 1, and (3) Alternative 2.

<u>No Action Alternative</u> – The No Action Alternative would continue baseline training activities. Approximately 3,926 activities are conducted. The Navy would also continue to operate under existing access restrictions. These include the restriction of training within some beach lanes of the SSTC during the nesting season, except for designated beach crossing lanes. In addition, training is not permitted inside buffer zones that are established around all western snowy plover nests.

<u>Alternative 1 (Preferred Alternative)</u> – Alternative 1 would increase training tempo from baseline conditions, conduct existing routine training at additional locations within SSTC established training areas, introduce new platforms and equipment into training, and increase access and availability to existing beach and inland training areas. Training would be allowed in additional beach lanes of the SSTC during the nesting season if other similar lanes are occupied or otherwise unavailable for use, or if attributes of these lanes make them more suitable for training than other similar lanes. The Navy would restrict training from occurring in buffer zones surrounding up to 22 western snowy plover nests at one time, not all western snowy plover nests. Also, the Navy would conduct training involving foot traffic, but not vehicle traffic, in the vernal pools when conditions are determined to be dry.

<u>Alternative 2</u> – Alternative 2 is identical to Alternative 1, except that the Navy would utilize all 7,000 yards of ocean beaches along SSTC-N and SSTC-S, and all bayside training beaches, except the Delta North and South nesting habitat for continuous, year-round training. Similar to the No Action Alternative and Alternative 1, the Navy would continue to conduct existing management practices on these lanes, including, nest relocation, predator management and control, habitat modification, site preparation for maintenance, nest substrate enhancement,

signage and education, recreational use restrictions, and rearing of collected eggs, injured and sick individuals.

Other approaches that were considered but eliminated because they did not meet the purpose and need included:

- Alternate training complex locations;
- Training relocation to SSTC-S;
- Training reductions;
- Simulated training;
- Allow unrestricted usage of training lanes 8, 9, and 10 if California least tern nesting threshold is reached;
- Creating more than or less than 22 concurrent buffered and marked avoidance areas for western snowy plovers.

## B. Summary of Alternatives Considered by NMFS

For the three alternatives previously identified, the Navy includes an associated list of standard protective measures specifically developed to minimize adverse impacts on marine mammals. As a cooperating agency, NMFS worked with the Navy during the development of the EIS to identify a series of mitigation measures (for marine mammals) that the Navy should consider in their analysis.

NMFS' alternatives are not enumerated in the Navy EIS, but are supported by the analyses in that EIS, and consist of:

<u>No Action Alternative</u>: The Navy's training operations would continue at current levels. The Navy would not request, and NMFS would not issue, an incidental take authorization for an increased level of activity.

<u>Preferred Alternative</u>: NMFS issues an IHA authorizing take of marine mammals incidental to the subset of the Navy training activities (i.e., those proposed activities listed in the Alternative 1 of the Navy's EIS) presented to NMFS as the specified activities described in the Navy's request for MMPA authorization and including the mitigation, monitoring and reporting analyzed as part of the proposed action in Chapter 5 of the EIS.

<u>Non-preferred Action Alternative:</u> NMFS issues an IHA authorizing take of marine mammals incidental to a subset of the Navy training activities (i.e., those proposed activities listed in the Alternative 1 of the Navy's EIS) presented to NMFS as the specified activities described in the Navy's request for MMPA authorization (activities included within Navy's preferred alternative), but with additional mitigation requirements for marine mammals to include measures considered but eliminated by Navy in section 5.9.3 of the EIS.

C. THE ENVIRONMENTALLY PREFERRED ALTERNATIVE

NMFS has identified the Navy's Action Alternative 1 as the Environmentally Preferred Alternative because it fully meets the Navy and Department of Defense current and near-term training and test and evaluation requirements while also implementing mitigation and management measures to protect the environment.

## IV. PUBLIC INVOLVEMENT

Public opportunities for review and comment have occurred throughout the development of the Navy's EIS and NMFS' proposed issuance of the IHA. Detailed information on the publications in which the Notice of Intent to prepare an EIS and the Draft EIS were noticed are provided in the FEIS, and the Final EIS was similarly made available in January 2011. The distribution list for the EIS is presented in Chapter 9 of the Final EIS.

During the public review process for the Draft EIS (DEIS), the Navy received comments from 108 individuals and 22 agencies and organizations. The Final EIS addressed all oral and written comments received during the Draft EIS comment period. As a cooperating agency, NMFS assisted in the analysis and consideration of public comments in NMFS' areas of jurisdiction and expertise to support the development of the Final EIS. Navy ensured the Final EIS was mailed to all individuals, agencies, and organizations that requested a copy of the final document, and that Final EIS remains available on the website at: www.silverstrandtrainingcomplexeis.com.

The Navy received comment letters from the Environmental Protection Agency (EPA), the California Parks and Recreation, and 14 private citizens and organization during the FEIS wait period, which NMFS were provided with and reviewed. EPA's primary concern was on the sediment quality and recommended a reduction on underwater explosive activities. None of the comments on the SSTC FEIS is related to NMFS' action (the issuance of an MMPA authorization).

Substantial public involvement occurred in association with NMFS' proposed IHA. On October 19, 2010 (75 FR 64276), NMFS published a notice of receipt of the application for the U.S. Navy's SSTC training activities and the proposed IHA, with a request for comments and information open through November 18, 2010. During the 30-day public comment period, NMFS received comments from the Marine Mammal Commission. The comments were considered in developing the final IHA and are fully addressed for making the determination in the issuance of the IHA.

## V. MITIGATION, MONITORING AND REPORTING MEASURES

The IHA includes detailed mitigation measures that must be implemented by Navy when conducting specified activities in the SSTC. In addition, the IHA requires the Navy to implement extensive monitoring and reporting. Inclusion of these requirements ensures that

NMFS' action of issuing the IHA specifies and requires all practicable means to avoid or minimize environmental harm from the selection of EIS Alternative 1.

## VI. CONCLUSIONS

Through the Final EIS and as documented in this ROD, NMFS has considered the goals and objectives of the NMFS proposed action and has analyzed a reasonable range of alternatives that adequately address the objective of the proposed action. Furthermore, NMFS has analyzed the associated environmental consequences of the identified alternatives and the mitigation measures and monitoring requirements needing to be analyzed and required under IHA. NMFS has also considered the public comments addressed to the Navy in the EIS and the comments addressed to NMFS during the proposed IHA comment period. Consequently, NMFS has selected the alternative of issuing the IHA authorizing the unintentional harassment of marine mammals incidental to Navy activities in the SSTC in accordance with Alternative 1 of the Final EIS for the period March 2011 through March 2012, including in that IHA specified requirements for mitigation, monitoring and reporting.

Signed: ______________________ Date: 3-11-11

Eric Schwaab
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