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.