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STAFF RECOMMENDATION

ON CONSISTENCY DETERMINATION

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Consistency Determination No.	**CD-033-10**
Staff:	MPD-SF
File Date:	6/7/10
60th Day:	8/20/10
75th Day:	9/4/10
Commission Meeting:	8/12/10

FEDERAL AGENCY: **Department of the Navy (Navy)**

PROJECT LOCATION: The Navy's Silver Strand Training Complex (SSTC), which consists of Navy base lands and nearshore areas, from the southern portion of the Naval Air Station North Island (NASNI), Coronado, south to immediately north of Imperial Beach, San Diego Co. (Exhibits 1-2)

PROJECT DESCRIPTION: Existing and expanded training activities (Exhibit 3)

SUBSTANTIVE FILE DOCUMENTS: See page 65.

Staff Recommendation: Conditional Concurrence. Motion is on page 15. Conditions are on pages 16-17.

EXECUTIVE SUMMARY

The Navy has submitted a consistency determination for existing and expanded training activities at the Silver Strand Training Complex (SSTC). Training activities include physical conditioning, force protection, mine counter measures, amphibious operations, over the shore logistics, mission area training, and Naval special warfare. On an overall basis (i.e., number of training activities per year), the Navy proposes a 36% increase in activities – from 3926 to 5343 activities. More of the increase would be in-water (versus on-land) activities – water

activities would increase 59% and land activities would increase 28%. Helicopter flights (from NASNI or NAB to STCC) would increase from a baseline of 100-150 sorties/year to 350-400 sorties/year (helicopter routes are shown in Exhibit 2).

The proposal includes expanding training activities into environmentally sensitive habitat areas (ESHA). Of particular concern is habitat for the California least tern and western snowy plover on the oceanside beaches, and San Diego fairy shrimp in vernal pools and salt marshes further inland. The Navy has been working extensively with the U.S. Fish and Wildlife Service on measures to protected least terns and snowy plovers, in an adaptive management fashion. Least terns nest in dense concentrations; plover nests are isolated from each other. The Navy marks least tern nests with tongue depressors and marks snowy plover nests (and up to 30 m buffer areas) with blue flexi-stakes. Additional equipment may be in place where beneficial for predator management. Nests are sometimes moved short distances. Extensive predator monitoring and management is conducted, although the Navy has not been authorized to control the gull-billed tern, due to its rare status. Beach wrack is retained where it would benefit plovers. The Navy proposes to prepare a Long-term Site Enhancement Plan to improve tern and plover nesting habitat.

In the past, the Navy has agreed to avoid or seasonally these areas; however the Navy states they will be needed for the expanded training levels proposed. The Navy has been quite successful in helping increase overall least tern populations on its bases in San Diego; however least tern *breeding* success, and snowy plover population levels, have been problematic, and new threats to both species from predation by gull-billed terns and climate change create additional uncertainty for their protection. In addition, the three beach lanes currently off limits to Navy training (i.e., the 3 southernmost lanes at STCC-N) during the nesting season have the highest nest rates of the STCC-N beach lanes.

The Navy's analysis of the effects of increased training are based on models designed to assess where training and nesting would potentially conflict at STCC-N. The Navy acknowledges the sensitivity of the 3 southernmost STCC-N beach lanes to for least tern and snowy plover nesting, and the Navy intends to only use these areas during the nesting season when no alternatives are available. The Navy's models predict that the Navy will need these areas about 24 times per year during the nesting season. The Navy's criteria for when the three lanes (STCC-N Beach Lanes Blue 2, Orange 1, and Orange 2) will be used is as follows:

> *The first criterion is driven by an operational need for training lanes. It allows use of Blue 2, Orange 1, and Orange 2 when a training lane(s) is needed and other suitable training lanes are already occupied and unavailable for use. Under this criterion, SSTC-N Beach Lanes Blue 2, Orange 1, and Orange 2 could be used during the nesting season if Beach Lanes Red 1 and 2, Green 1 and 2, and Blue 1 are being used and additional training lane(s) are needed for training. Beach Lanes would be*

opened one at a time, based on need, with Blue 2 opened first, Orange 1 second, and Orange 2 last, where such selection would maintain the realism of training and training needs.

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

Concerning the San Diego fairy shrimp, which live in vernal pools at STCC-S, and which are currently off-limits to training, the Navy's mitigation commitments include limiting training activity within the pools to foot traffic, and only then when vernal pools are dry.

Additional least tern, snowy plover, and San Diego fairy shrimp/vernal pool mitigation measures are contained in the Fish and Wildlife Service's (FWS) Biological Opinion (BO). The Terms and Conditions of that Opinion require:

For Least Terns and Snowy Plovers:

1. Consider tide conditions and schedule training on the hardpack during low tides to the maximum extent consistent with training needs.
2. Mark and buffer up to 22 concurrent snowy plover nests, *plus* any additional plover nests in beach lanes Orange 1 and 2.
3. If nest relocations are needed, relocate them the shortest distance possible and use FWS-approved monitors, with weekly reporting to FWS.
4. Brief dog handlers of nest protection guidelines, and if dog conditioning is needed on soft pack sand, use the sand road (east of nesting areas) or stay within 20 ft. of hard pack sand.
5. Avoid dog conditioning in the 3 southern STCC-N lanes until after completing and coordinating with FWS a study evaluating the effects of military working dogs on terns and plovers.
6. Limit dog training across the beach and inland to beach lanes Yellow 1, and the northern half of Yellow 2, and Green 1 and 2, pending completion of the above-mentioned study.
7. Coordinate with FWS and submit for its review and approval the design and scope of work for this dog training study, as well as for the Long Term Habitat Enhancement Plan for STCC.
8. Submit annual reports to FWS detailing monitoring, impact, and remediation measures for least terns and snowy plovers.

9. Assure the biological monitors look for and document the location lf lest tern or snowy plover nests, eggs and chicks before and after all training exercises, to allow assessment of take.

For San Diego Fairy Shrimp

1. Avoid occupied vernal pools when designing parachute drop zones, including 30 m buffers.
2. To the maximum extent consistent with training need, avoid the occupied vernal pools and their watersheds.
3. Avoid vernal pools 1-7 (Exhibit 7) year round to the maximum extent consistent with training need (using markers, maps, GPS coordinates, or any other means consistent with training needs).
4. Keep military dogs out of vernal pools year round.
5. Mark pools to facilitate monitoring, determine baseline conditions and San Diego fairy shrimp distribution and abundance (and related conditions important to the species), submit a draft monitoring plan for FWS review and approval, including maps of training areas, vernal pools and their watersheds, focused vegetation, topography, hydrology, water quality, and fairy shrimp surveys, protocols and methodology for determining when vernal pools are to be considered "dry," monitoring plans to address training impacts (including remediation measures if impacts are detected), submit annual reports to FWS, completion of baseline monitoring before any training occurs in or around the vernal pools, and implement measures identified in annual monitoring reports.

Based on its estimate of "take" (under the Endangered Species Act), the FWS has issued its "No Jeopardy" opinion, stating:

> *In the accompanying biological opinion, we determined that the level of anticipated incidental take of California least terns, western snowy plovers, and San Diego fairy shrimp is not likely to result in jeopardy to these species.*

In the context of species' recovery efforts, the FWS states that for least terns, STCC-N and Delta Beaches "… will continue to support abundant least tern nesting activity and thereby continue to make a substantial contribution to the recovery of the species." For snowy plovers, FWS states that the proposed training "is not expected to preclude recovery of the plover," but that "it is expected to reduce the likelihood of future population growth within the action area due to the cap placed on nest avoidance (i.e., 22 concurrent nests) and the projected increase in human activities." For fairy shrimp, the FWS states that: "… we expect that the currently occupied pools will continue to support viable fairy shrimp populations in support of recovery of the species."

It is clear that the Navy's extensive conservation and adaptive management efforts to date have contributed greatly to the population levels of least terns, snowy plovers and San Diego fairy shrimp in the project area. Nevertheless, all three species remain at serious risk of extinction; ongoing threats to these species, including relatively recent threats from predation by gull-billed terns, climate change and sea level rise, pose further risks. The areas currently off limits to training but proposed for expansion of training are regionally highly significant and particularly important for each of the three species.

While overall least tern populations are up, reproductive success numbers for the past 20 years are troubling, particularly in the San Diego area. Snowy plover numbers have not been increasing but have stayed relatively constant since 2005, and statewide populations have decreased since 2005. Over 97% of vernal pools in San Diego County have been destroyed, and since its listing, San Diego fairy shrimp populations have not increased.

The Navy does not disagree that these areas provide important habitat, which is at least part of the reason the Navy has agreed, to date, to keep these areas off limits to training activities (seasonally for the tern/plover nesting, and year-round for the vernal pools). The Navy intends to use these areas for training only when no alternative areas are available, and, hopefully, sparingly. The key questions before the Commission are, therefore:

(1) whether the Navy's models accurately estimate whether, and if so when, increased training will need to be located within these areas;

(2) whether the Navy's criteria for when these areas would need to be used are sufficiently specific and limited to assure they would only be used when adequate measure are in place to protect sensitive species;

(3) whether the artificial "cap" on plover nests (no more than 22 nests would be protected) is warranted and adequate to protect nesting snowy plovers;

(4) whether training cannot be conducted without avoiding vernal pools containing San Diego fairy shrimp year-round, rather than just during the wet season, and, if not, whether the species can tolerate the impact of such training; and

(5) whether the process for a to-be-determined study addressing dog training in the 3 southernmost STCC-N lanes is adequate at this time to enable a determination that the training will avoid or minimize effects on plovers and terns.

As proposed by the Navy (including as conditioned by the Fish and Wildlife Service), the proposed expansion of training into these highly sensitive and regionally important habitat areas would not be consistent with the requirements of Section 30240 of the Coastal Act to protect environmentally sensitive habitat areas against any significant disruption, to be limited to only uses dependent on those resources, and to be compatible with the continuance of these habitat areas. The Commission both appreciates the Navy's ongoing efforts to

protect species, and understands that bird nesting has continued in all beach lanes even with Navy training occurring during the nesting season (other than in the southernmost 3 beach lanes). However, the areas previously off-limits, but now proposed to include training, are regionally important refuges for these species.

None of these species' recovery efforts have been sufficiently successful to provide much comfort that species affected can tolerate additional adverse impacts, especially given the above noted, relatively new and confounding threats from predation by gull-billed terns and climate change/sea level rise. Thus, it is premature *at this time* to expand training into these areas for logistical military reasons that include an assumption that cessation of war efforts overseas will occur *and* will be accompanied by an increase in training area needs. Actual, rather than projected, needs should be the determinant as to whether the Navy truly does need to expand into any or all of these areas.

To conclude, five conditions are needed to bring the project into consistency with Section 30240. If agreed to by the Navy, these conditions would result in the Navy returning to the Commission with a supplemental consistency determination when expanding training into the identified sensitive areas to demonstrate whether such expansion is in fact needed, and providing the latest information available about the least tern and snowy plover populations at that time. The conditions also address the need to: (1) protect all snowy plover nests (not set a cap at 22 nests), with the potential for Commission staff authorization/concurrence of specific instances of nest/buffers removals or relocations *temporarily* to accommodate a necessary training event; (2) assure dog training in the three southernmost STCC-N Beach Lanes, the terms of which are still being worked out between the Navy and the FWS, will not occur until the Commission agrees to the adequacy of the to-be-agreed-upon plan and management measures; (3) avoid training in all San Diego fairy shrimp-occupied vernal pools, year-round; and (4) provide the Commission staff with all monitoring reports prepared for the FWS. If the Navy were to agree to implement these conditions, the proposed training could be found consistent with the requirement of Section 30240 of the Coastal Act.

Marine resource effects may occur, primarily from underwater detonations, temporary logistics-over-the-shore training activities (e.g., pile-driving), and amphibious landings. These activities would be of short duration, but each has the potential to affect eelgrass, commercial and recreational fish stocks, sea turtles, and marine mammals. The Navy conducts extensive ongoing eelgrass monitoring, as well as successful restoration impacts for eelgrass affected from past Navy projects, throughout San Diego Bay. The Navy will mitigate any eelgrass at a 1.2:1 ratio, which the Commission has found acceptable in past Navy San Diego area projects, given the proven success of the program.

The Navy states that the expected approximately 415 underwater detonations per year: (1) will be limited to sandy bottom substrate areas; (2) will avoid eelgrass beds; (3) will, with one exception, be limited to single detonations per training event; and (4) would be limited to use of small charges.

The Navy states marine mammal impacts will be limited to bottlenose dolphins and California sea lions, that only a small number have the potential to be exposed, that the only sea turtle expected in the affected area is the green sea turtle, and the probability is very low that it would be encountered, and that adequate monitoring and mitigation measures are in place to assure protection of marine mammals and sea turtles. The mitigation measures include monitoring and establishing a 1,300 ft. radius safety zone in very shallow waters, a 2,220 ft. radius safety zone for deeper but still shallow waters, timing of any multiple detonation-training in a manner to assure no loss of monitoring capabilities, avoiding areas where floating kelp exists (as marine mammals may be present), avoiding flocks of diving birds, and establishing a 105 ft. safety zone around pile driving.

The proposed nearshore areas should be far easier to monitor than open ocean areas in areas where the Commission has expressed concerns over Navy monitoring and mitigation protocols. Here, because of the Navy's greater ability to monitor, because no particularly heavy concentration of marine mammals or sea turtles would be affected by the activities, because of the short duration of the individual training activities, and with the mitigation measures and protocols incorporated into the activities, the activities would not adversely affect marine resources and would be consistent with Section 30230 of the Coastal Act.

The Navy has been training at the SSTC for over 60 years, with some training activities requiring temporary public access restrictions for both public safety and military security needs. The proposed expanded training levels would increase the amount of time needed for temporary public exclusions from baseline levels. Currently, public use of SSTC-N beaches is restricted; however, SSTC-S beaches below the mean high tide line are and will continue to be available for public use when not restricted for military training. The Navy states that historically, these restrictions have been rare and temporary, and that local residents are familiar with Navy protocols for these restrictions. The restrictions will be limited to small areas, and the Navy states less than 0.3 % of SSTC's total water training area would be restricted. The Navy will notify the public of necessary restrictions during training activities with underwater detonations, through a Notice to Mariners (NOTMAR). Sections 30210 and 30212 of the Coastal Act allow public access limitations when necessary for, among other things, environmentally sensitive habitat, public safety, and military security needs. The project is consistent with the public access, recreation, commercial and recreational fishing and boating, and diving policies (Sections 30210, 30212, 30220, 30234, and 30234.5) of the Coastal Act.

Water quality effects could occur from the use of fuels, engine oil, hydraulic fluids, batteries, flares, explosives, anti-corrosion coatings, and anti-fouling paints. The Navy maintains oil spill clean-up procedures and states the quantities of petroleum products leaked or spilled during training activities would be negligible, and that residue from explosives (which would only use small charges) would be limited to trace concentrations. Mitigation measures incorporated into the training include collecting spent training materials at the conclusion of training activities, avoiding washing causeway pier sections in the ocean, and pumping

seawater or potable water during simulated fuel transport training activities rather than using actual petroleum products. The project would be consistent with the water quality policy (Section 30231) of the Coastal Act.

STAFF SUMMARY AND RECOMMENDATION

I. STAFF SUMMARY:

A. Project Description. The Navy has submitted a consistency determination for its ongoing and proposed training activities within the Silver Strand Training Complex (SSTC) and the southern nearshore area of Naval Air Station North Island (NASNI) in Coronado (Exhibits 1-3). The SSTC is located on and adjacent to the Silver Strand peninsula, and it is divided into two non-contiguous areas: SSTC-North (N) and SSTC-South (S). SSTC-N includes land on the northern half of the Silver Strand peninsula, as well as adjacent nearshore waters of the Pacific Ocean and San Diego Bay. SSTC-S includes land on the southern end of the Silver Strand peninsula, as well as adjacent nearshore waters of the Pacific Ocean. SSTC-N and SSTC-S are separated by Silver Strand State Beach (SSSB). The NASNI training area is composed of the beaches and nearshore waters from Breaker's Beach to Zuniga Jetty, west of the City of Coronado.

SSTC-N contains 10 oceanside beach and boat training lanes (numbered as Boat Lanes 1-10), ocean anchorage areas (numbered 101 through 178), bayside water training areas (Alpha through Hotel), and bayside beaches (Alpha through Charlie, Delta North and Delta South) (Exhibit 1). The anchorages lie offshore of SSTC-N in the Pacific Ocean, and overlap a portion of Boat Lanes 1-10. SSTC-N consists of 745 acres of land owned by the federal government and approximately 257 acres leased by the Navy from the State of California. The lease extends to the 1948 mean high tide, which the Navy describes as extending out to between 100 to 500 feet (ft) offshore from the current mean high-tide line. The current lease expires in 2021.

SSTC-S contains of four oceanside beach and boat training lanes (numbered as Boat Lanes 11-14) and inland training areas and facilities inside a fenced area (Figure 1-3 and Table 1-1). SSTC-S consists of approximately 548 acres of land owned by the federal government down to the high tide line, with offshore training areas, including lands below the current mean high tide line, owned by the State of California.

Each of the STCC-N and STCC-S Boat Lane is 500 yds. wide and 4,000 yds. long, and is designated by color (with each color representing two lanes).

The Navy has been conducting its activities on these bases for the past 60 years; however, aside from single-event training exercises, this is the first time the Commission will be reviewing the training on these bases. As the Commission has seen in recent years, the Navy has been regularly preparing environmental documentation ("NEPA" documents) and, where

applicable, federal consistency documents, to cover in a more comprehensive manner both offshore and onshore Navy training activities (e.g. on the Pt. Mugu Sea Range (CD-2-01) and SOCAL Training Range (CD-049-08 and CD-086-06).

The Navy's mission is to:

> *… support U.S. Navy and Marine Corps amphibious, special warfare, and mine countermeasure training by providing local land, sea, and airspace support services; material; and training facilities that will help Naval and Marine Corps forces achieve and maintain the highest level of operational readiness.*

The Navy further states:

> *Training ranges like SSTC provide a controlled and safe environment with threat-representative targets that enable U.S. forces to conduct realistic, combat-like training as they undergo all phases of the graduated buildup needed for combat-ready deployment. Navy ranges provide the space necessary to conduct controlled and safe training scenarios representative of those that military men and women would face in actual combat. The ranges are designed to provide the most realistic training in the most relevant environments, replicating as closely as possible the expected challenges. The integration of undersea ranges with land-based ranges, safety landing fields, and amphibious landing sites are critical to this realism, allowing real-time practice of complex scenarios. Live training is the cornerstone of readiness for U.S. military forces in a security environment characterized by uncertainty and surprise.*
>
> …
>
> *Over the years, the tempo and types of training activities have fluctuated within SSTC because of changing environments, the introduction of new technologies, the dynamic nature of international events, advances in warfighting doctrine and procedures, and force structure changes. … The factors influencing tempo and types of operations are fluid in nature, and will continue to cause fluctuations in training activities at SSTC.*
>
> *As forces return from Iraq and Afghanistan which have required a greater focus on mountain warfare, we can expect them to return their focus to littoral warfare requiring a return to training in more traditional intensities on the SSTC. Should the U.S. find itself embroiled in a conflict involving a high level of activity in the littoral environment, we can expect to see a corresponding training effort to utilize facilities that provide the ability to meet these training needs. SSTC forms the keystone for this type of training capability. In the meantime, military forces must undergo training to develop and maintain core competencies in littoral warfare and SSTC provides the required training environment.*

Navy training at STCC consists primarily of: physical conditioning, force protection, mine counter measures, amphibious operations, over the shore logistics, mission area training, and Naval special warfare. The Navy proposes to continue or expand 78 categories of *existing* training activities and to institute 11 *new* categories of activities. All existing and proposed activities, including the location, duration, and annual occurrence of each are shown in Exhibit 3 (Navy CD, Table 1-2). Existing activities are numbered; for new activities the letter "N" (left column in the Table) precedes the number. The activities are divided into general tactical tasks, listed as:

1. Conduct Maneuver-Move Forces
2. Perform Mine Countermeasures
3. Conduct Maritime Interdiction
4. Amphibious Operations
5. Conduct Naval Special Warfare (NSW)
6. Perform Tactical Reconnaissance and Surveillance
7. Construct, Maintain, and Operate Logistics Over-the-Shore
8. Conduct Mission Area Training (including NSW Diving and Beach Operations, Land Warfare, and Advanced Training)
9. Provide/Execute Physical Fitness Training for U.S. and Other Nation Units and Individuals
10. Provide Industrial and Environmental Health Services
11. Protect Against Combat Area Hazards
12. Force Protection: Protect and Secure Area of Operations
13. Combat Terrorism

The 11 proposed *new* activities would be:

1. Shock Wave Action Generator (SWAG)
2. Surf Zone Test Detachment/ Equipment T&E
3. UUV Neutralization
4. AN/AQS-20 Mine Hunting
5. AN/AES-1 Airborne Laser Mine Detection System
6. AN/ALQ-220 Organic Airborne Surface Influence Sweep (OASIS)
7. Airborne Mine Neutralization System (AMNS)
8. Tactical Recovery of Aircraft and Personnel (TRAP)
9. Underwater Demolition Qualification/ Certification
10. Vehicle Patrolling and Testing
11. NSW Underwater Demolition Training

More detail on the new activities is provided in Exhibit 4.

On an overall basis (i.e., number of training activities per year), the Navy proposes a 36% increase in activities – from 3926 to 5343 activities. More of the increase would be in-water (versus on-land) activities – water activities would increase 59% and land activities would

increase 28%. Helicopter flights (from NASNI or NAB to STCC) would increase from a baseline of 100-150 sorties/year to 350-400 sorties/year (helicopter routes are shown in Exhibit 2).

The training includes use and regular exercise of military working dogs. Exercising dogs will be on leashes and will primarily run on hard pack sand below the mean high tide line. The dogs are trained to avoid nesting birds, and marked and buffered bird nests will be avoided. Dog exercise will not occur in the 3 southernmost STCC-N lanes until further coordination, study, and agreement on conservation measures between the Navy and the U.S. Fish and Wildlife Service.

The proposed increase includes criteria which, if met, would result in expanded training into environmentally sensitive areas (least tern and snowy plover nesting areas in the three southern-most beach lanes of STCC-North (STCC-N; Beach Lanes Blue 2, Orange 1, and Orange 2 (Exhibits 1d & 6a-c)) and vernal pools at STCC-South (at the Naval Radio Receiving Facility (NRRF) (Exhibit 7)). These aspects of the proposed training are discussed in more detail in the environmentally sensitive habitat Section of this report below.

Finally, the Navy proposes upgrading training vessels, aircraft, and vehicles, including Amphibious Assault Vehicles (AAVs) with Expeditionary Fighting Vehicles (EFVs), updating the Offshore Petroleum Discharge System (OPDS), the converting of existing helicopters to MH-60S and MH-60R helicopters, and enhancements of training facilities at SSTC.

B. <u>Alternatives Considered</u>. Because the Commission staff comment letter on the Navy's EIS requested information about alternatives, the Navy included in its consistency determination a discussion of alternatives. Alternatives discussed include: (1) training at other bases, relocating activities from STCC-N to STCC-S; (2) reductions on training levels; (3) simulated training; (4) detonating explosives on land instead of in the water; (5) allowing unrestricted training at STCC-N Lanes 8-10 if least tern nesting thresholds are reached; and (6) increasing or decreasing the number of snowy plover nests to be protected (i.e., more than 22 nests). This alternatives discussion is contained in Exhibit 5. The following quotes summarize the Navy's discussion:

> ***Alternate Training Complex Locations***
>
> *The proximity of SSTC to equipment, personnel, facilities, and organizational services that are necessary for training at SSTC is vital to the efficient execution of Navy training. Training ranges outside of the San Diego area do not provide co-location of commands, equipment, facilities, or infrastructure, which are provided on NAB Coronado, necessary to support existing and future training to meet training and personnel tempo requirements. SSTC is critical to Navy training programs due to its unique combination of attributes that cannot be duplicated.*

Other military training areas located within the San Diego area, such as the Marine Corps Base Camp Pendleton, San Clemente Island, and Remote Training Site Warner Springs, do not meet the criterion necessary for amphibious and special warfare training for many reasons, including their lack of calm waters and steeper offshore bottom terrain. Further, these other training areas already sustain their own training activity schedules and priorities; thus, they would be unable to meet the tempo requirements necessary for Fleet deployment schedules.

Because of the CCC's comment on the SSTC Draft EIS to move operations to Camp Pendleton, additional clarifying detail is provided on why Camp Pendleton was found not to be an appropriate location for relocation of training because:

- *Most training involves a large number of personnel, slow-moving barge-type vessels, inflatable vessels, and/or heavy equipment, all of which are stationed and maintained in housing/command facilities, piers, and yards on NAB Coronado. None of these could be quickly moved on a daily basis back and forth from NAB Coronado to Camp Pendleton.*
- *The training environment at Camp Pendleton is not appropriate for most types of training that is conducted at SSTC.*
- *Camp Pendleton does not offer 3.9 nm of coastline necessary for relocation of Navy training.*
- *Camp Pendleton does not offer calm water necessary for most types of training.*

Training Relocation to SSTC-S

Many training activities are already conducted on SSTC-S. The Navy considered each of the remaining activities on SSTC-N and found that it was not feasible to relocate them to SSTC-S because of its insufficient infrastructure and increased time requirements associated with planning, logistics, and training.

SSTC-S beach lanes do not have the same physical attributes as their northern counterparts. … Many training activities require facilities on SSTC-N that are not available on SSTC-S, including the extensive obstacle course, rappel tower, dining facilities, and housing facilities on SSTC-N. This alternative, therefore, does not allow for the full range of required training elements at a single location. In addition, the time required for planning, logistics, and transport would be increased if activities were relocated to SSTC-S. … As a result, training times would increase and training schedule requirements for fleet deployment schedules would not be met.

SSTC-S low-tide beaches are used by the public, while public use of SSTC-N beaches is restricted.

Training Reductions

Reductions in training from current levels at SSTC would not support the Navy's ability to meet training requirements consistent with the FRTP. A reduction in the types, or tempo of training activities available at SSTC would mean that local units/users would have to routinely travel to other range complexes to fulfill training requirements. As outlined in Section 1.2, this is not a feasible alternative.

Simulated Training

An alternative that would rely entirely on computer-simulated training would not meet the purpose and need for the Proposed Action (Section 1.4). … Virtual and constructive training, however, are an addition to, not a substitute for, live training. Unlike live training, simulated training does not provide the requisite level of training or realism necessary to attain combat readiness; and simulated training cannot replicate the high-stress environment encountered during an actual contingency situation.

Construction and Use of Demolition Pit at SSTC-S

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

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

The Navy originally considered allowing full-year, unrestricted usage of Blue 2, Orange 1, and Orange 2 beach lanes for training if 1,120 California least tern nests occur the previous year on NBC property excluding nests in the lanes(s) (Beach Lanes Blue 2, Orange 1, and/or Orange 2). If the nesting threshold was not met, the lanes would not be opened except in other proposed criterion. The intent of this consideration was to allow for unencumbered training while still ensuring a high level of California least tern nesting at SSTC. Under the nesting threshold of 1,120, the Navy would maintain more than its currently high percentage of breeding pairs

(15 to 20 percent) at NBC necessary to support a viable population (5,000 pairs, as stated in Akcakaya et al. 2003).

…

During consultation with the USFWS, this criterion was eliminated from consideration and replaced with different criterion (Section 1.5.5). The USFWS felt that the criterion was too complicated, and that a nesting threshold would not be scientifically defendable.

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

Currently, the Navy buffers and marks avoidance areas around each western snowy plover nest established on SSTC. The Navy considered placing caps on the number of concurrent western snowy plover nests buffered at SSTC, due to a concern that an increase in western snowy plover nesting population would adversely affect training.

Under current training conditions, Navy training officers are notified of the location of the nests or buffers and plan their training activities to avoid entering the buffer areas. A few training activities, such as individual basic physical fitness activities, may be able to work around the training buffers. These activities incorporate identifying and avoiding plover nest buffer areas into the activity. Other training does not require use of beach areas and thus would not be affected by the presence of plovers. Most other training activities, however, are unable to operate around the buffers. The buffers are artifacts on the beach that do not occur in real world wartime situations, and adversely affect the value of training (e.g., presence of the plover nests restrict flexibility for maneuvering across the beach and inhibit real-time, tactical decision-making). Activities involving heavy equipment and vessels require large unconstrained maneuvering space without encumbrances, precluding areas with buffered plover nests. To accommodate training requirements for these activities, the activities are often shifted in their entirety to the north or south, away from the buffers, so that personnel or equipment will not encounter the buffers. Under current conditions, this approach is feasible. Where needed, training activities can and are moved to other available training lanes that are free of plover nests or contain a maximum of two plover nests at one time. SSTC has historically typically had less than 22 maximum active nests at one time.

The Navy considered creating an avoidance cap of more than 22 concurrent western snowy plover nests, but found that approach could render some training lanes unusable. Twenty-two concurrent nests would translate into approximately two concurrent nests in each viable lane on SSTC (i.e., 14 training lanes excluding Beach Lanes 1, 5, and 6, which have not historically had nests due to the shallow beach and hummocks). If plover nests increase, buffering each nest will constrain the available

beach area such that the beach will not adequately support military readiness training activities. Two nests per training lane at the same time by themselves could encumber 60 m of the 500-m beach lane width (12 percent). If the nests happen to be spaced closely together and/or close to the edge of the lane, the area in between the nests or between the nests and the edge of the lane may also become unusable for training (e.g., if there are 100 m between the nests and 50 m between the nests and the edge of the lane, then about 40 percent of the lane could be rendered unusable). Snowy plovers are not colony breeders and prefer to distance their nesting activities as far as they can from other nesting plovers. As such, plover nests are more likely to be evenly spaced and encumber larger, rather than smaller sections of the training beach. Also, as discussed above, many training activities require that an additional buffer be provided away from the staked buffers to ensure that the stakes are not visible or an encumbrance to personnel being trained. Adding a third nest per training lane could potentially render the entire lane unusable. With the anticipated increase in training tempo of the SSTC training beaches (see Section 1.5.1), training activities may not be able be moved to other less encumbered beach lanes like they can be and are under current conditions.

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

C. Federal Agency's Consistency Determination. The Navy has determined the project consistent to the maximum extent practicable with the CCMP.

II. STAFF RECOMMENDATION:

The staff recommends that the Commission adopt the following motion:

MOTION: **I move that the Commission conditionally concur with consistency determination CD-033-10 and determine that, as conditioned, the project described therein is fully consistent, and thus is consistent to the maximum extent practicable, with the enforceable policies of the California Coastal Management Program (CCMP).**

STAFF RECOMMENDATION:

Staff recommends a **YES** vote on the motion. Passage of this motion will result in a conditional agreement with the determination and adoption of the following resolution and findings. An affirmative vote of a majority of the Commissioners present is required to pass the motion.

RESOLUTION TO CONDITIONALLY CONCUR WITH CONSISTENCY DETERMINATION:

The Commission hereby **conditionally concurs** with consistency determination CD-033-10 by the Navy on the grounds that the project would be fully consistent, and thus consistent to the maximum extent practicable, with the enforceable policies of the CCMP, provided the Navy agrees to modify the project consistent with the conditions specified below, as provided for in 15 CFR §930.4.

Conditions

1. **Limit on Training in STCC-N Beach Lanes 8-10 During Least Tern/Snowy Plover Nesting Season.** Except as indicated in the remainder of this condition, the Navy will refrain from using the portions of the three southernmost STCC-N Beach Lanes (Lanes Blue 2, Orange 1, and Orange 2) above the beach crest 20 ft. inland of the high tide line), during the least tern/snowy plover nesting season (April 1 – August 30). If and when the Navy contends that redeployment of military personnel to the United States has increased the Navy's training needs to a level necessitating use of these lanes during the nesting season, the Navy will submit a supplemental consistency detemination to the Commission describing: (1) the least tern and snowy plover populations at that time, including the extent to which the snowy plover populations in the area's recovery unit (RU-6) has reached the Management Potential Breeding Number (under the U.S. Fish and Wildlife Service 2007 Recovery Plan (or whichever Recovery Plan is current at that time)); (2) an explanation as to why training in these lanes during the nesting season is necessary (i.e., why it could not feasibly be conducted at alternative locations or time periods); and (3) a description of the monitoring and avoidance measures that will be incorporated into any such training events.

2. **Limit on Marked Snowy Plover Nests.** The Navy will mark all snowy plover nests and 30 meter buffer areas in the same manner it has committed to for the 22 nests/buffers (i.e., the Navy will not limit the number of nests marked to 22 nests). (The Navy currently marks the nests/buffers with blue stakes, up to 30 m from nests.) For all beach lanes, if the Navy wishes to use a lane for training that contains more than two plover nests, and the location of the nests/buffers renders the lane unusable for needed training exercises, the Navy will not remove any nest/buffer markers unless the Navy submits a plan to the Executive Director for temporary removal of markers for the duration of the training event and the Executive Director concurs, in which case the Navy will limit such removal to

that described in the plan that received the Executive Director's concurrence. The request will include: (1) an explanation as to why the Navy believes that the nest and buffer make the training infeasible; (2) provisions for trained monitors to be present during the training event to maximize avoidance of harm to the nests with eggs and birds; (3) a discussion of whether nests and eggs could be relocated in a manner that would enable the training to occur without removing the markers; and (4) post-event reporting to the Commission staff as to the impact of the training on nesting success.

3. **Dog Training in STCC-N Beach Lanes 8-10 During Least Tern/Snowy Plover Nesting Season.** Dog training in the three southernmost STCC-N Beach Lanes (Lanes Blue 2, and Orange 1 and 2), which is proposed to occur only after Navy/Fish and Wildlife Service agreement on further study and management measures as specified in Condition 1.6.3 of the FWS BO Terms and Conditions, shall not occur until the Navy has submitted the agreed-upon plan and management measures to the Commission for review and concurrence.

4. **Vernal Pools.** Vernal pools containing San Diego fairy shrimp (as shown on Exhibit 7, or as may be superceded by more recent surveys conducted under Term and Condition 4.1 of the USFWS BO, which requires baseline surveying prior to conducting exercises at STCC-S) will be fenced or otherwise marked as off limits for training exercises, including foot traffic, parachute drops, and military dogs, throughout the year.

5. **Monitoring Reports.** The Navy will provide the Commission staff with a copy of all monitoring reports prepared for the U.S. Fish and Wildlife Service under the July 7, 2010 Biological Opinion.

III. APPLICABLE LEGAL AUTHORITIES.

A. Standard of Review. The federal Coastal Zone Management Act ("CZMA"), 16 U.S.C. § 1451-1464, requires that federal agency activities affecting coastal resources be "carried out in a manner which is consistent to the **maximum extent practicable** with the **enforceable policies** of approved State management programs." Id. at 1456(c)(1)(A) (emphasis added). The implementing regulations for the CZMA ("federal consistency regulations") 15 C.F.R. § 930.32(a)(1) define the phrase "consistent to the maximum extent practicable" to mean:

> *… fully consistent with the enforceable policies of management programs unless full consistency is prohibited by existing law applicable to the Federal agency.*

This standard allows a federal activity that is not fully consistent with California's Coastal Management Program ("CCMP"). to proceed, if full compliance with the CCMP would be "prohibited by existing law." The Navy, in its consistency determination, did not argue that full consistency is prohibited by existing law or provide any documentation to support a

maximum extent practicable argument. Therefore, there is no basis to conclude that existing law applicable to the Federal agency prohibits full consistency. Since the Navy has raised no issue of practicability, as so defined, **the standard before the Commission is full consistency with the enforceable policies of the CCMP**.

B. Enforceable Policies. The Commission's federal consistency actions are based on the "enforceable policies" of the federally approved CCMP, which are the policies of Chapter 3 of the Coastal Act (Cal. Pub. Res. Code §§ 30200-30265.5). The Navy's consistency determination questions whether the environmentally sensitive habitat policy (ESHA, Section 30240) meets the definition in the CZMA of an enforceable policy. The CZMA (16 U.S.C. § 1453) defines enforceable policies as follows:

> *(6a) The term "enforceable policy" means State policies which are legally binding through constitutional provisions, laws, regulations, land use plans, ordinances, or judicial or administrative decisions, by which a State exerts control over private and public land and water uses and natural resources in the coastal zone.*

The Navy's consistency determination begins with a discussion of which of its proposed activities affect coastal zone resources, in Section 2.2 (CD, p. 2-2), as follows:

> ***SUMMARY OF PROPOSED ACTION ACTIVITIES IN THE COASTAL ZONE***
>
> *Seventy-two of the 89 activities included in the Proposed Action may have reasonably foreseeable effects on CZ resources or uses. Because these activities are similar in many respects, however, their effects on CZ uses or resources also are similar. This section summarizes reasonably foreseeable effects of Navy training activities by the affected CZ resource. Reasonably foreseeable effects on CZ uses or resources from each training activity under the Proposed Action are indicated in Table 2-1.* [Exhibit 8]

In the above-described analysis, the Navy includes activities affecting snowy plover and least tern nesting and foraging. However, the Navy's consistency determination follows with a statement that no CCMP enforceable policy is available to protect these species. The Navy states (CD, p. 2-41):

> ***2.4 COASTAL RESOURCES NOT ANALYZED FOR CONSISTENCY WITH ENFORCEABLE POLICIES***
>
> ***2.4.1 Effects on Birds***
>
> *Under the CZMA, California least terns, western snowy plovers, and light-footed clapper rails* (Rallus longirostris levipes) *are CZ resources because they forage and nest in the CZ. Nesting for these bird species on SSTC, however, occurs on land that is by law subject solely to the discretion of the federal government, which is excluded*

> *from the CZ. The State of California has no enforceable policies that regulate California least tern or western snowy plover nesting in areas that do fall under the definition of the CZ, however, and the Proposed Action does not affect California least tern or western snowy plover foraging or other activities in the CZ. Therefore, effects on California least terns and western snowy plovers are not addressed in Section 3, Consistency Determination. The light-footed clapper rail may nest and forage in the CZ, but no training activities are planned in salt marshes where the rail nests and finds shelter, or in the mudflats where it forages under the Proposed Action. Thus, the light-footed clapper rail will not be affected by Navy training under the Proposed Action, and is not addressed in Section 3.*
>
> *The Section 30240 of the CCA (California Public Resources Code §30240) applies to environmentally sensitive land in the CZ. The California least tern and western snowy plover nesting areas on SSTC are not located within the CZ. They are located on land the use of which is under the exclusive use of the Navy. There are no other CCA enforceable policies that address California least tern or western snowy plover nesting in areas that do fall under the definition of the CZ. Thus, impacts on California least tern and western snowy plover nesting areas on SSTC are not subject to consistency determination under California's enforceable polices.* [Emphasis added]

The Navy follows this statement with recognition of the Commission's "interest" in the subject, and then proceeds to summarize the conclusions of its Endangered Species Act analysis "…for informational purposes." That analysis is discussed in the ESHA section (IV. A) of this report.

Concerning impacts on vernal pools, the Navy similarly states:

> *SSTC-S Inland contains vernal pools that support specialized plants and invertebrates. Under the Proposed Action, the Navy would allow off-road foot traffic during training activities on the portion of SSTC-S Inland that supports vernal pools when the vernal pools are dry. Determination of whether the vernal pools are dry will be determined by personnel under the guidance of the Navy's botanist or wildlife biologist. Vernal pools on SSTC-S Inland, however, would be excluded from the CZ because SSTC-S Inland is by law subject solely to the discretion of the federal government. Therefore, vernal pools will not be evaluated for consistency with State enforceable policies in Section 3.*

The federal consistency regulations (15 CFR §§ 930.11 (h)) further define "enforceable policy" as follows:

> *(h) Enforceable policy. "The term 'enforceable policy' means State policies which are legally binding through constitutional provisions, laws, regulations, land use plans, ordinances, or judicial or administrative decisions, by which a State exerts*

> *control over private and public land and water uses and natural resources in the coastal zone," 16 U.S.C. 1453(6a), and which are incorporated in a management program as approved by OCRM either as part of program approval or as a program change under 15 CFR part 923, subpart H. An enforceable policy shall contain standards of sufficient specificity to guide public and private uses. Enforceable policies need not establish detailed criteria such that a proponent of an activity could determine the consistency of an activity without interaction with the State agency. State agencies may identify management measures which are based on enforceable policies, and, if implemented, would allow the activity to be conducted consistent with the enforceable policies of the program. A State agency, however, must base its objection on enforceable policies.*

The 2001 preamble to the federal consistency regulations (FR December 8, 2000, p. 77130) amplifies:

> *Section 930.11(h) adds a definition of enforceable policy by reference to CZMA Sec. 304(6a), and clarifies that an enforceable policy must be sufficiently comprehensive and specific to control coastal uses while not necessarily inflexibly committing the State to a particular path. See American Petroleum Institute v. Knecht, 456 F. Supp. 889, 919 (C.D. Cal. 1978), aff'd, 609 F.2d 1306 (9th Cir. 1979); 15 CFR section 923.40(a); Conference Report at 972. One Federal agency, three States and the environmental groups had various comments on this definition. These comments included: the definition is too broad, enforceable policies should include federal law, the section should require compliance with State environmental review requirements, and that not all policies should have to be formally incorporated into federally approved management programs.*
>
> *NOAA did not change the definition based on these comments. Changing the scope of the definition of enforceable policies would be inconsistent with the CZMA. Under CZMA Sec. 307(c), Federal agencies are required to submit a consistency determination to the State agency if it determines that there are reasonably foreseeable effects. The consistency determination should include an evaluation of the proposed activity in light of the applicable enforceable policies in the State's Coastal Management Program (CMP). The State has the authority to then review this consistency determination and decide whether it agrees with it, including the Federal agency's interpretation of the State's enforceable policies. If the State disagrees with the consistency determination, then it must describe how the activity is inconsistent with the enforceable CMP policies and alternatives (if they exist) that would allow the activity to be conducted in a manner consistent to the maximum extent practicable. If agreement cannot be reached between the State and Federal agencies, the Federal agency may still proceed with the activity, as long as it clearly describes to the State the specific legal authority which limits the Federal agency's discretion to comply with the State CMP's enforceable policies.*

The Commission agrees with *most* of the Navy's determinations as to which of its activities affect the coastal zone. The one area where the Commission disagrees with the Navy's "effects" analysis is over effects to vernal pool habitat containing the federally listed as endangered San Diego fairy shrimp *(Branchinecta sandiegonensis).* The Commission considers effects to this species and habitat to constitute effects on the natural resources of the coastal zone due to: (1) the fact that the species status is endangered, which makes adverse effects to any habitat for the species a threat to the very survival of the species, thus affecting all members of this species; (2) the species' range, which is limited to coastal areas[1]; and (3) the vernal pools that constitute its habitat are not independent of one another but rather a part of a regional vernal pool complex that includes vernal pools in the coastal zone elsewhere in San Diego County. This position is consistent with historic Commission interpretation treating federally listed as endangered and threatened species occurring on federal land (but also occurring within the coastal zone) to be subject to the "effects" test. As an example, in reviewing the Orange County Toll Road on Camp Pendleton Marine Corps Base (Foothill Transportation Corridor-South (FTC-S), Consistency Certification CC-018-07), the Commission found:

> *As discussed elsewhere in this report, coastal zone effects from the project include effects on public access, recreation, surfing, scenic coastal public views, water quality, archaeological resources, wetlands, environmentally sensitive habitat areas (including habitat for a number of coastal wildlife species including the Pacific pocket mouse, tidewater goby, coastal California gnatcatcher, arroyo toad, southern California coast steelhead, least Bell's vireo, San Diego fairy shrimp). Regardless of the status of federal land relative to the "coastal zone," the Commission has historically and consistently considered effects to wetlands and listed species located on federal land to constitute coastal zone effects.*

More problematic is the Navy's subsequent assertion that the CCMP lacks enforceable policies to protect environmentally sensitive habitat areas (ESHA) on federal land. The Navy assertion is accompanied by an assertion that: "The State of California has no enforceable policies that regulate California least tern or western snowy plover nesting in areas that do fall under the definition of the CZ." The Commission does not understand this statement, and both these assertions run contrary to the fundamental purpose of the CZMA, the nature of the protections afforded by Section 30240, and 30 years of consistent Commission interpretation.

The CZMA, by its very nature, makes certain state regulatory rules applicable to federal agencies and gives state coastal regulatory agencies a role in reviewing federal actions – whether they be permitting actions or funding decisions with respect to other entities or

[1] This animal is restricted to vernal pools in southwestern coastal California and extreme northwestern Baja California, Mexico. All known localities are below 700 meters (m) (2,300 feet (ft)) and within 65 kilometers (km) (40 miles (mi)) of the Pacific Ocean, from Santa Barbara County south to northwestern Baja California (USFWS 1997).

federal actions implementing federal programs – that the states would not otherwise have. See, e.g., 16 U.S.C. § 1456(c)(1)(A). That section also expands the geographic scope of those state regulations, making clear that federal agency activities are to be so governed regardless of their location "within or outside the coastal zone." The fact that the CZMA applies to federal activities outside the coastal zone further exemplifies the fallacy in the Navy's argument. Were it true that the phrase "enforceable policies" had to be construed to refer only to policies that could be enforced under state law *in the particular context at issue*, there could be no such policies in a states coastal management program that apply outside the coastal zone, which would make the "within or outside the coastal zone" language in section 1456(c)(1)(A) meaningless. Similarly, it would mean that there were no such policies applicable to federal agency activities, which would undermine the very purpose of the CZMA's allocation of responsibility to the states.

In fact, the phrase "enforceable policies" was intended to refer to the nature of the policy in general as one that requires compliance rather than being simply suggestive or articulated in a manner that is more in the nature of a recommendation.

The Commission has consistently interpreted Section 30240 of the Coastal Act to be applied to protect ESHA both within the federal coastal zone and on federal lands arguably excluded from the federal coastal zone that are nevertheless within the coastal zone as defined by the CCMP[2] (see, for example, above-cited Orange County Toll Road Case). In terms of ESHA within the coastal zone, several litigation cases confirm the need for the Commission to protect ESHA within the coastal zone (see, *e.g., Bolsa Chica Land Trust et al., v. The Superior Court of San Diego County* (1999) 71 Cal.App.4th 493, 517, and *Pygmy Forest, supra, 12 Cal.App.4th at p.613).*

The Navy's analysis ignores the fundamental concept inherent in the CZMA that once effects on a state's coastal zone are present, then all the state's CMP enforceable policies (in the CCMP's case, all Chapter 3 Coastal Act policies) apply to that activity. No other federal agency has previously made an assertion to the contrary in the 30+ years the Commission has been acting on federal agency determinations, and this assertion flies in the face of a very large number of Commission actions for activities on federal land. For example, since 1994 the Commission has regularly acted on U.S. Air Force management plans to address conflicts between public access and snowy plover protection needs on Vandenberg Air Force Base in Santa Barbara County (Consistency Determinations: CD-012-94, CD-067-95, CD-006-98, CD-019-00, CD-023-01, CD-046-01, CD-105-01, CD-089-02, and CD-094-04 (Interim Plover Management Plans at Vandenberg Air Force Base). As noted above, the Commission's objection to the Orange County Toll Road (CC-018-07) hinged in part on

[2] Section 30008 of the Coastal Act was amended in 1978 (Cal.Stats. 1978, Ch. 1075) specifically to expand the geographic scope of the act by applying its policies to "federal lands excluded from the coastal zone pursuant to the Federal [CZMA] of 1972," where the State would "consistent with applicable federal and state laws, continue to exercise the full range of powers, rights, and privileges it now possesses or which may be granted."

findings that, despite that the species being affected were on federal land (Camp Pendleton Marine Corps Base), as well as being predominantly inland of the coastal zone boundary, the *species* at issue were coastal species, Section 30240 was the applicable enforceable policy, and the project was inconsistent with Section 30240. The Commission found:

> *The project involves development within environmentally sensitive habitat areas (ESHA) and is inconsistent with the ESHA policy (Section 30240), which only allows "uses dependent on the resource" within an ESHA. … The ESHA include habitat for the Pacific pocket mouse, tidewater goby, arroyo toad, coastal California gnatcatcher, least Bell's vireo, and southern California coast steelhead. The most significant adverse impacts, impacts which cannot be mitigated, would be to the Pacific pocket mouse. In fact, it is highly likely that the project would result in the complete loss of one of the three remaining limited populations of Pacific pocket mouse and thereby hasten the extinction of the entire species, which is federally listed as endangered. The project would also likely result in the loss of the only remaining coastal population of the arroyo toad, also federally listed as endangered, because it proposes at least three years of significant construction activities within more than 39 acres of ESHA for this species. The project also proposes to conduct grading, vegetation removal, and substantial landform alteration associated with the placement of the six lane toll road within 32 acres of the vitally important coastal sage scrub vegetation community that provides federally designated critical habitat for the coastal California gnatcatcher, a third species listed under the federal Endangered Species Act. Moreover, the project proposes permanent and prolonged use of wetland areas totaling over 29 acres, areas that have included federally designated critical habitat for two species that are federally listed as endangered, the tidewater goby and arroyo toad, and provide essential ESHA habitat for two others also provided with this listing status, the least Bell's vireo and southern California coast steelhead.*

A review of past Commission reviews of federal agency activities, predominantly occurring on federal land, shows over 260 cases where the Commission's review included analyzing Section 30240 as an enforceable CCMP policy. (A list of significant cases include Consistency Determinations CD-001-82, CD-019-82, CD-11-83, CD-016-83, CD-027-83, CD-020-85, CD-007-86, CD-020-90, CD-61-93, CD-105-95, CD-021-97, CD-065-97, CD-090-98, CD-010-00, CD-106-01, CD-011-02, CD-025-02, CD-052-02, CD-088-02, CD-060-03, CD-033-04, CD-085-04, CD-090-04, CC-072-05, CD-066-06, CC-018-07, CD-046-07, CD-048-07, CD-014-08, CD-009-10, and CD-026-10.) In addition, over the past 30 years the Navy itself has submitted over 260 consistency determinations, again the vast majority located on federal land, none of which (until the subject consistency determination) containing an assertion that Section 30240 was not an enforceable policy under the CCMP for environmentally sensitive habitat on federal land. Finally, since least terns and snowy plovers forage in the marine environment, and within the coastal zone, they are also subject to the marine resource protection policies in Section 30230.

C. Conditional Concurrences. The federal consistency regulations (15 CFR § 930.4) provide for conditional concurrences, as follows:

> *(a) Federal agencies, … should cooperate with State agencies to develop conditions that, if agreed to during the State agency's consistency review period and included in a Federal agency's final decision under Subpart C … would allow the State agency to concur with the federal action. If instead a State agency issues a conditional concurrence:*
>
> *(1) The State agency shall include in its concurrence letter the conditions which must be satisfied, an explanation of why the conditions are necessary to ensure consistency with specific enforceable policies of the management program, and an identification of the specific enforceable policies. The State agency's concurrence letter shall also inform the parties that if the requirements of paragraphs (a)(1) through (3) of the section are not met, then all parties shall treat the State agency's conditional concurrence letter as an objection pursuant to the applicable Subpart . . . ; and*
>
> *(2) The Federal agency (for Subpart C) … shall modify the applicable plan* [or] *project proposal, … pursuant to the State agency's conditions. The Federal agency … shall immediately notify the State agency if the State agency's conditions are not acceptable; and*
>
> *…*
>
> *(b) If the requirements of paragraphs (a)(1) through (3) of this section are not met, then all parties shall treat the State agency's conditional concurrence as an objection pursuant to the applicable Subpart.*

IV. Findings and Declarations. The Commission finds and declares as follows:

A. Environmentally Sensitive Habitat. Section 30240 of the Coastal Act provides:

> *(a) Environmentally sensitive habitat areas shall be protected against any significant disruption of habitat values, and only uses dependent on those resources shall be allowed within those areas.*
>
> *(b) Development in areas adjacent to environmentally sensitive habitat areas and parks and recreation areas shall be sited and designed to prevent impacts which would significantly degrade those areas, and shall be compatible with the continuance of those habitat and recreation areas.*

The Navy's proposal includes expanding training activities into environmentally sensitive habitat areas (ESHA). Sensitive species that would be adversely affected include the federally listed as endangered California least tern (*Sternula antillarum browni*) and federally listed as threatened western snowy plover (*Charadrius alexandrinus nivosus)*, which nest in

the dry sand portion of the beach lanes at STCC-N and STCC-S, and the federally listed as endangered San Diego fairy shrimp *(Branchinecta sandiegonensis),* which occurs in 11 vernal pools and salt marshes in the eastern portion of STCC-S. As noted in the project description, the Navy has been conducting training in the beach lanes for 60 years, and for the past 16 years, once least terns began nesting on the beach areas, been working extensively with the U.S. Fish and Wildlife Service on measures to protected least terns (and later snowy plovers), in an adaptive management fashion. The Navy's consistency determination states:

> ***2.4.1.1 California Least Tern and Western Snowy Plover Management on SSTC***
>
> *In 1994, California least terns began nesting on oceanside beaches where military training takes place. Policies had to be established to protect the terns, and this began the development and evolution of a series of adaptive measures, with each year bringing ever-increasing least tern numbers and a new set of circumstances. As nesting on oceanside training beaches continued to increase, the Navy adapted and improved its approach as a result of information gained from monitoring and experimentation.*
>
> *In 1996, the Navy coned off 500 yd 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, leaving other training areas unimpeded (Biological Opinion [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. These measures resulted in an increase from one nest to 21 nests at Delta Beach South. The expansion of nesting on the oceanside beaches continued, amplifying the challenge of protecting the least terns (Copper 2003).*
>
> *In 1997, western snowy plover nests began appearing on the SSTC-N oceanside beaches. The Navy began establishing avoidance zones by placing stakes at a distance less than 30 m around the nests, which were avoided during training. Twelve hundred yd of Green Beach were coned off by the Navy to protect nesting in the lanes. Poles for power lines along Silver Strand Highway were also removed, and the power lines 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 into the nesting area.*

Since that time, the Navy, working with the Fish and Wildlife Service, attempted a number of strategies to reduce conflicts between training and habitat needs. These included: (1) adding beach-crossing lanes in specified locations; (2) discontinuing coning off Green Beach; (3) changing the color and size of beach cones to avoid attracting predators; (4) marking individual tern nests with stakes, attempting to deter least nesting (but not deter snowy plover

nesting) in lanes Green 2 and Blue 1 by raking and collecting eggs; (5) discontinuing the raking as it was unsuccessful; (6) collecting eggs in training areas and taking them to Sea World for hatching to determine whether they could be reared in captivity; (7) setting aside three unraked lanes for nesting and marking nests outside these lanes with tongue depressors; (8) marking and providing buffers for snowy plover nests; (9) continuing efforts to enhance bayside nesting areas at Delta Beach; (10) retaining beach wrack on oceanside beaches in areas not used for training to attract snowy plovers to these areas; (11) changing disking to grading at Delta Beach (to avoid weeds); (12) seasonal restriction in the three southern STCC-N lanes and modifying beach-crossing lane alignments to minimize the need for relocation of least tern nests; (13) adding a lane in front of Green 1 to allow high tide crossing by training groups; (14) taking 50 least tern eggs to Sea World for captive rearing; (15) discontinuing predator controls in certain lanes to determine whether birds would prefer areas where predator controls were occurring (lanes Orange 1 and 2) or Delta Beach; (16) resumption of predator controls as this effort was unsuccessful; (17) installing mini-enclosures around snowy plover nests to reduce predation; (18) using Nixilite™ at Delta South to deter predators; (19) installing video cameras to monitor and study predation; (20) placing 3,000 cu. yds. of sand at Delta Beach to improve substrate for plover and tern nesting; (21) grading and topographically modifying the beach by adding sand hills at lanes Green 1 and 2 to reduce their attractiveness for nesting; and (22) treating Delta beaches and lanes Blue 2 and Orange 1 and 2 with herbicides to enhance nesting. While some of these efforts were more successful than others, in any event least terns continued to nest heavily in oceanside and beach training areas. The Navy notes that it was able "… successfully avoid… incidental take of least terns, which remained far below the incidental take authorized in its BOs."

With these efforts, the increases in least tern populations on both sides of the Silver Strand have increased relatively dramatically - about a 300% increase in least tern populations over 20 years (Exhibits 9-10). Snowy plover increases have been far less successful – as shown in Exhibit 11, both plover nests and fledging success have remained within a similar range since 2000. Current tern and plover nest locations are shown in Exhibit (Exhibits 1d & 6a-c). Both species are at risk from a growing and fairly recent problem due to the influx of gull-billed terns, which predate on both least tern and snowy plovers. In any event it is quite clear that the three beach lanes currently off limits to Navy training (i.e., the 3 southernmost STCC-N lanes) during the nesting season have the highest nest rates of the STCC-N beach lanes.

The Navy's analysis of the effects of increased training, including training within the 3 southernmost STCC-N beach lanes, on tern and plover nesting success, are based on models designed to assess where training and nesting would potentially conflict at STCC-N. The Navy's models are described in its consistency determination (pp. 2-43 to 2-45). The consistency determination states:

> *The models were run 1,000 times for the Proposed Action scenario. Standard deviations were evaluated to ensure that variation in the results between model runs would not under or over represent impact results. The models found that Lanes 8, 9, and/or 10 would need to be used under the average and highly intense training scenario for the Proposed Action because of the increase in training tempo.*

The consistency determination describes the "increased training tempo" as follows:

> *Under the Proposed Action, the Navy would increase the tempo of training to meet 100 percent of Navy NTA requirements. This would increase annual baseline training tempo from 3,926 training activities to approximately 5,343 training activities (Table 1-2). Training tempos proposed under the Proposed Action consider changing training requirements, the introduction of new technologies, the dynamic nature of international events, advances in warfighting doctrine and procedure, and force-structure changes.*

The Navy's EIS further states (p. ES-4):

> ***Need for Increased and Improved Training at SSTC***
>
> *The Navy and Marine Corps are continuously adapting to meet changing military readiness requirements. A number of changes within the Navy and Marine Corps are transforming and increasing the training requirements on SSTC:*
>
> *• The Navy's approach to pre-deployment training (the FRTP), that requires a unit be ready to deploy much earlier in the pre-deployment training cycle (i.e., the ability to surge-deploy). These training cycles require operational commands to increase their training tempos.*
>
> *• U.S. Special Operations Command's force expansion and restructuring per the December 2002 Office of the Secretary of Defense Program Decision Memorandum, which includes the increase of Naval Special Warfare personnel operating on NAB Coronado, equivalent to one additional Sea, Air, and Land team.*
>
> *• The Navy's Total Force Strategy, under which Explosive Ordnance Disposal groups have initiated a forcewide realignment, which emphasizes right-place, right-time training and has necessitated expanded use of Southwest Region training venues, including SSTC.*
>
> *• The Congressionally-authorized increase in Marine Corps personnel to 202,000 active-duty personnel will in turn increase the number of Marine Corps personnel cycling through training programs at SSTC.*

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

The Navy's EIS further states (p. 2-6):

> *The U.S. military commenced operations in Afghanistan and Iraq as part of the Global War on Terror; the deployment of units overseas caused many range complexes, including SSTC, to experience temporary decreases in usage. Additionally, the focus of individual and unit training has temporarily shifted from SSTC to inland (desert or mountainous) environments to prepare personnel for conditions they will encounter in combat operations overseas. Thus, historical usage at SSTC was evaluated to determine the baseline training tempo at SSTC. Training at SSTC is not only expected to return to normal baseline levels after the conclusion of military combat operations in Iraq and Afghanistan, but to increase beyond baseline levels to support organizational realignments and address new surge requirements.*

For impacts on least terns, the Navy's incidental take analysis states:

> *Modeling for the highly intense training scenario conservatively estimated that 88 California least tern nests under baseline conditions and 105 California least tern nests under the Proposed Action would be directly impacted annually.*

Comparing this "take" level to baseline conditions, the Navy states:

> *Based on this analysis, the average incidental take for baseline conditions (38 nests) was approximately 2.3 times lower than the highly intense training scenarios estimate of incidental take (88 nests). This lower ratio of actual to highly intense (2.3 times less) was applied to the modeled highly intense take results for the Proposed Action (105 nests) to generate an average estimated take for those Alternatives. Under the Proposed Action, 45 nests are expected to be taken in an average, typical year.*

The Navy acknowledges the greater sensitivity of the 3 southernmost STCC-N lanes, and proposes to use them only when no other areas are available. Based on its models, the Navy estimated that it would need to use these 3 lanes during the nesting season 24 times per year. The Navy states:

> *The model results determined that Beach Lanes 8, 9, and 10 (Blue 2 through Orange 2) would need to be used for limited training during the nesting season, and estimated that, in an average year, 24 training activities would occur above the mean high tide line. The training that would occur in these lanes would have a temporary footprint of less than one-third of the lane on the western edge of where least terns nest. Twenty-two of the 24 activities would be expected to require logistical or safety vehicles, which would typically require limited use of the soft-packed sand along the western side of the area where the least terns nest. Two of the 24 activities would include a beach party team (heavy equipment), which would also use the soft-packed sand along the western edge.*

Next, estimating "take" based on this level of use, the Navy states:

> *Navy training activities under the baseline condition would result in an average yearly mortality of approximately 38 nests, with an estimate[d] 88 California least tern nest takes under the highly intense training scenario. An average yearly mortality of 45 California least tern nests, or 3.1 percent of the nests on the training lanes, would be expected for SSTC-N oceanside training lanes under the Proposed Action (see Section 2.4.1.2.1 for modeling methodology). A high mortality of 105 California least tern nests, approximately seven percent of nests on the training lane, would be expected for the SSTC-N oceanside training lanes. Thus, in a typical/average year, the Proposed Action would take seven more nests than the baseline condition. In a worst case year, the Proposed Action would take 17 more nests than the baseline condition.*
>
> *All birds present would be subject to potential disturbance, including harassment in Beach Lanes Blue 2 through Orange 2 because they would receive some use. The model estimated that of the average 45 nests annually taken, 41 nests would be taken in Beach Lanes 1-7 (Yellow 1 through Blue 1) and four nests would be incidentally lost in Beach Lanes 8, 9, and 10 (Blue 2, Orange 1 and 2). Losses in Beach Lanes 8, 9, and 10 on an average year may be associated with beach party team activities, logistical vehicles, running, and mine countermeasure activities.*

Analyzing the significance of this estimated take level, the Navy states:

> *Table 2-2 indicates the level of authorized and actual take of least terns since 1999. The take estimates assume continuation of the present configuration of tern nesting on the Navy training beaches as well as an immediate 30 percent increase in training; training, however, would actually increase gradually, or be phased in, over time. Least tern nesting would likely to shift away from more heavily used training areas towards less utilized training areas, as they have historically. This would make actual nest lost less than estimation from the take model. Even if this were not the case, average loss of 45 nests and worst case loss of 105 nests are both below the incidental take allowance in 2009 (330 nests). SSTC has historically had losses*

> *greater than 45 nests (2002, 2003, and 2009) and nesting has not only persisted, but continually increased, after these losses. Much of this has to do with the Navy's mitigation measures and management practices discussed below. The losses also would not decrease existing range-wide nesting (8,173 nests in 2006) below the 5,722 nests discussed above that would sustain a safe rangewide population (Akçakaya et al. 2003; USFWS 2005).*

Table 2-2 (CD, p. 2-48) indicates:

Table 2-2: California Least Tern Historical Take Allowance and Level of Take in the Region of Influence

Year	**Take Allowance**	**Actual Take (eggs and chicks)**
1999	20 eggs/chicks	1
2000	20 eggs/chicks	3
2001	20 eggs/chicks	6
2002	75 eggs to rear in captivity, 30 eggs to relocate	58*
2003	68 nests or 135 eggs/chicks	72*
2004	129 nests or 387 eggs/chicks	16
2005	263 nests	38
2006	263 nests	23
2007	455 nests	42
2008	330 nests	30
2009	330 nests (extension of 2008 take allowance)	53

*This includes 50 eggs in 2002 and 51 eggs in 2003 removed from training areas and taken to Proje Wildlife or SeaWorld for captive rearing.

Looking at overall population impacts, the Navy states:

> *A population viability analysis that was presented by the USFWS (2005) determined that 5,000 breeding pairs would be sufficient to sustain a viable rangewide population. Maintaining this population would depend on annual production of a certain number of nests rangewide. Five thousand pairs would be needed to maintain a sustainable population; this estimate translates into 5,715 nests laid every year (5,000 pairs x 1.143 nests/pair = 5,715 nests). In 2006, there were 8,173 nests rangewide (per the 2006 breeding survey). Subtracting the Navy's conservatively estimated loss of 385 nests from those 8,173 rangewide nests results in 7,788 nests. The 7,788 nests would continue to be laid rangewide each year, which is still substantially higher than the 5,715 nests necessary for the 5,000 pairs that are needed to maintain a sustainable population.*

The Navy acknowledges threats to the species such as predation by the gull-billed tern, stating:

> *The ongoing impact of gull-billed tern predation on least tern colonies surrounding San Diego Bay, including Naval Base Coronado (NBC), is of particular concern because of the contribution of these colonies to the overall least tern status, the level of predation recorded at these colonies in recent years (USFWS 2009), and the likelihood that ongoing lack of productivity could eventually depress the numbers of least terns in this area, if left unchecked.*

The Navy will continue to commit to implementing conservation measures to compensate for past and future losses of least terns associated with training activities, both on-site and in other San Diego base areas to maintain population diversity. The Navy assumes the above-estimated take levels to be a "worst-case scenario," in part because increases in training would be gradual, because "training tempo would likely increase more gradually as troops return from overseas duty," and because:

> *There are also several reasons to anticipate that, even at full training tempo, the estimated effect would be overestimated. The protection during the majority of the breeding season of 40.63 acres of oceanfront beach habitat (Beach Lanes Blue 2 through Orange 2) would offset the effect of heavy training in other oceanside training lanes. Also, the use of several conservative assumptions in the impact analysis has overestimated effects.*

In addition to impact minimization measures, the Navy also proposes additional habitat enhancement. The Navy states:

> *The Navy is proposing to develop and implement a long-term site enhancement plan for SSTC-N, including both the oceanside and the bayside beaches. This site enhancement plan would work to control, and where possible, remove invasive non-native vegetation on the beaches, and, if appropriate, replace it with native vegetation. SSTC-N oceanside training lanes currently contain over 16 acres of overgrown invasive vegetation, mostly towards the back one third of the beach. While this additional depth of beach is needed for several reasons, including separation from the highway, most training would have a minimal footprint on this area. Training would be most heavily concentrated in areas closest to the tide line. Removal or replacement of invasive overgrown vegetation in the back beach area would open these safer areas up to nesting activity.*

The Navy estimates such enhancement could offset nest losses by creation of optimistically 722 nests, and more realistically at least 360 nests annually. The Navy concludes, with respect to least tern impacts:

> *The Navy would continue its current natural resource management program, add the above two mitigation approaches, and adapt the overall program as appropriate in the future to provide maximum protection to the species while still meeting training*

> *needs and realism. The program has, and is expected to continue to fully mitigate for training-related impacts on California least tern nesting on the SSTC training beaches under the Proposed Action.*

Concerning snowy plover impacts, the Navy began monitoring and managing for plovers in the early 1990s. Snowy plover numbers have increased significantly from 11 in 1992 to 134 in 2009, although as noted in Exhibit 11, the numbers have fluctuated since 2000, and nest numbers since 2005 have been affected by an unknown illness causing mortality in adult snowy plovers in and around San Diego Bay. The Navy states:

> *There were 80 western snowy plover nests documented in 2005 on NBC, representing a decrease of 32 percent from the 116 snowy plover nests present in 2004. Nesting in 2006 remained more or less steady, where there were 73 nests documented on NBC and mortality of many adults was due to unknown causes. Comparing Navy nesting plover numbers to regional data is difficult because the Navy records nests while much of the available state and county wide data only record adults detected via breeding-season window surveys. In 2005 and 2006, the Navy held 17 and 28 percent of the snowy plovers surveyed in San Diego County. Restriction of the beaches to primarily training use rather than recreational access, predator control efforts, buffering nests, and restricting training lane use help to maintain these numbers.*

The USFWS' Recovery Plan for the snowy plover (2007) identifies "Management Potential Breeding Numbers" for each of the six identified recovery units (RUs). The project area is in RU-6, which consists of SSTC, Silver Strand State Beach, NASNI, and Delta beaches. The identified goal for RU-6 is:

> *… 95 breeding adults including 65 breeding adults specific to SSTC (SSTC and SSSB) beaches, 20 breeding adults specific to NASNI, and 10 breeding adults specific to Delta beaches. The current Navy-preferred method for determining breeding pairs is maximum nests at one time. If one assumes that 95 breeding adults correlates to roughly 48 pairs necessary for the Silver Strand beaches, this implies at least 48 nests across all the Silver Strand would be required to meet recovery goals.*

With the mitigation measures incorporated into the training, the Navy believes this goal can be achieved. The Navy states:

> *Under the Proposed Action, Navy training activities on the beaches at SSTC-N and SSTC-S could result in disturbances that may reduce the nesting opportunities for snowy plovers. The effect of these actions on western snowy plovers cannot be analyzed the same way that it was for the least tern because the snowy plover nests would be buffered (up to 22 nests at one time on SSTC-N and SSTC-S under the Proposed Action) and avoided by trainees on the beach. Because of this avoidance, any impact on western snowy plovers would be only when chicks were outside of the*

> *staked areas. However, an effect could be more likely once the 22 buffered nests were reached.*
>
> *The proposed conservation measures would protect 22 plover nests from foot and vehicle traffic by establishing marked buffer zones around these nests. Males often lead chicks to less-disturbed sites, so the buffer zone surrounding each nest could provide a refuge for chicks if vehicle and foot traffic occurred in the area. When male snowy plovers lead chicks away from protected buffer zones, however, they could be exposed to foot and vehicle traffic associated with training. Nests that are not within a marked buffer zone could experience a higher rate of nest and chick loss to vehicles or foot traffic. The Proposed Action could result in loss of snowy plover chicks that ventured outside of marked buffer zones around nests, but this would not be common considering the size of the training area, the short duration of most training activities, and the limited footprint of training activities.*

The Navy will continue to implement predator management activities, stating:

> *The proposed predator management activities, including the deployment of mini-enclosures, would be expected to benefit the western snowy plover. Mini-enclosures would protect snowy plovers not only from mammals, but from the gull-billed terns that forage on NAB Coronado and SSTC-S beaches. Security patrols and symbolic fencing that discourage civilian pedestrian access would also limit the effects of this non-military activity.*

Historic average takes of snowy plovers since 1999 have been less than one/year. The Navy acknowledges these numbers could increase with increased training and possible increases in nest relocations associated with the training. The Navy notes:

> *Under baseline conditions, few western snowy plovers nests have been moved. The proposed increase in training activities, however, may modify plover nest placement on the beach and result in more nests that would be at risk. Additional unintentional takes could be caused by management activities such as snowy plover monitoring, banding, mini-enclosure placement, beach cleanup, predator control, site maintenance, and topographical alteration in Beach Lanes Green 1 and 2.*

Mitigation measures include protecting a maximum of 22 snowy plover nests (and up to 30 m buffer areas) at one time. For protected nests, the Navy estimates "take" could continue to be "near zero" from training activities. For unprotected nests, the Navy believes the impact will be "similar," stating:

> *When nests occur at the same time on the beach, each nest typically represents one pair of nesting birds. Maximum number of nests at one time is typically reflective of the number of pairs at a site. SSTC oceanside beaches typically have had 22 or less maximum concurrent nests at one time, or less than 22 nesting pairs of western snowy*

> *plovers, all of which would be buffered under the Proposed Action. If the population of western snowy plovers increases past 22 western snowy plover nesting pairs in the SSTC oceanside training lanes in the future, on average, less than 3.1 percent of the unbuffered additional nests at SSTC would be expected to be lost (greater than 96.9 percent of the unbuffered additional nests would not be lost) under the Proposed Action. For example, if 54 pairs of western snowy plovers were to nest on SSTC oceanside beaches (22 buffered pairs plus 32 unbuffered pairs), it would be expected that one of the unbuffered pairs' nests would be lost in an average year due to military training.*

Regionally for its bases, the Navy estimates:

> *Combining all the nesting on NBC property, it is estimated that if 68 pairs of western snowy plovers were to nest on NBC (54 pairs on SSTC oceanside beaches, 12 or more on NASNI, and two or more on the SSTC Delta Beaches), up to one pairs' nests may be lost in an average year due to military training.*

Looking at population impacts, the Navy states:

> *The USFWS Recovery Plan target for western snowy plover on the Silver Strand beaches, including non-Navy managed beaches (NASNI, SSTC-N, SSTC-S, Silver Strand State Beach, and the Coronado Beaches), is 95 breeding adults. The current preferred method for determining breeding pairs is maximum nests at one time. Assuming that 95 breeding adults correlate to 48 pairs necessary for the Silver Strand beaches, this roughly correlates to 48 required active nests at one time to meet recovery goals.*
>
> *The Proposed Action would allow for 22 of these nests to be buffered and protected on SSTC beaches. It is difficult to determine exactly the effect of buffering a maximum of 22 nests on SSTC-N and SSTC–S because of what may occur simultaneously or at different times in the season on other NBC beaches. Based on nesting number identified in Section 2.4.1.3.1, if 22 active nests are buffered on the SSTC oceanside beaches and 14 to 15 nests occur on other San Diego Bay NBC properties, the Navy could meet a substantial portion of the recovery goal on its beaches alone.*
>
> *Navy training in the action area would not be expected to jeopardize the western snowy plover population because the Navy would continue to implement current management measures (avoid plovers during training activities, monitor the status of plover populations, continue predator control efforts, and enhance substrate at Delta North and South), which have been successful in maintaining the population. It would be expected that effects due to predation, specifically the gull-billed tern, and unknown causes would continue to have a larger effect on the success of the species than Navy training under the Proposed Action.*

Concerning potential benefits from the Navy's long-term site enhancement plan described above, the plan would cover both the oceanside and the bayside beaches, and would include removal of invasive non-native vegetation on the beaches, which in turn would open up for nesting areas where training needs are lighter. The Navy estimates the enhancement could "realistically mitigate for an estimated 34 [plover] nests annually."

For both least terns and snowy plovers, the full suite of Navy mitigation measures is as follows:

> ***1.6.5 California Least Tern and Western Snowy Plover***
> *The following section describes efforts the Navy has undertaken to protect California least tern and western snowy plover on SSTC military training areas.*
>
> ***1.6.5.1 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 the western snowy plover and the 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 1.5.5. No military training is permitted within the protected nesting areas. Plovers nest individually or in loose groups, rather than in dense colonies like the terns do, so plover nest scrapes are marked with approximately 30-m buffers for avoidance beginning approximately March 1st. 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. Training lane access under the Proposed Action would depend on training needs.*
>
> *• Beach scheduling procedures will bias activities with intensive beach use towards beach lanes with fewer nests if 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 buffer area with a radius of approximately 30 m or smaller, is also marked with blue flexi-stakes, which are removed seven days after the plover eggs hatch, or when biologically practical to minimize impacts on plovers. No military training is permitted within the delineated buffer. Under the Proposed Action, this marking would be limited to 22 western snowy plover nests at one time on SSTC oceanside beaches.*
>
> *• Also depending on site-specific circumstances, some plover nests are covered with a mini-enclosure to protect them from mammalian and avian predators. Once chicks hatch, markers and mini-enclosures are removed within seven days, or when biologically practical to minimize impacts on plovers. The mini-enclosure is not*

installed when the risk of attracting humans that could 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 formed into a one-foot dome. Domes are placed over least tern nests to discourage gull-billed terns from preying on eggs or chicks. A study on the effectiveness of domes that documents the 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 used in front of the golf course on NASNI, in front of Building 710 of the Recreational Beach, and in all western snowy plover management areas on NASNI.

1.6.5.2 Communication of Training Area Protocols

• The Navy ensures 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 tongue depressors within beach lanes mark the locations of least tern nests; (3) that specific training areas are authorized; and (4) that incidental take of least terns and snowy plovers at SSTC-N and SSTC-S shall be avoided to the extent consistent with effective, realistic training. These access restrictions will be modified and communicated, as necessary, as the Navy meets criteria and thresholds for opening additional lanes.

1.6.5.3 Nest Relocation

• Nests may be moved short distances, as necessary and appropriate, to reduce conflicts with training, although such moving is infrequent. Snowy plover and least tern nests located in the Beach Crossing Lanes are typically relocated to safe areas because conflicts are expected, and nests have been relocated due to the threat of flooding. The Navy contacts USFWS and reports the circumstance that necessitated movement of any tern or plover nest. This notification 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.

1.6.5.4 Predator Management and Control

• Control of mammalian and avian predators of the least tern and snowy plover is conducted at all nesting sites. Due to the very rare status of the gull-billed tern, control of this known predator has not been approved by the USFWS. To date, the Navy has not been authorized to capture, relocate, shoot, or otherwise deter this species, although Migratory Bird Depredation Permit requests have been submitted

since 2005. Isolated attempts by U.S. Department of Agriculture Wildlife Services to discourage gull-billed terns from entering California least tern nesting colonies were considered ineffective.

The Navy has been using pole traps on and off since the inception of the program, depending on discussions with the U.S. Department of Agriculture and the USFWS. Pole traps are designed to catch avian predators of least tern and plover chicks, such as the American kestrel.

• Predator control to manage southern fire ants, field ants, Argentine ants, and pyramid ants found on North and South Delta Beaches and NASNI is conducted prior to and during the snowy plover and least tern nesting seasons.

• 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 Biological Opinion (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. Cameras allow documentation of which species are preying on least tern chicks.

1.6.5.5 Nesting Deterrence through Habitat Modification and Harassment

• Sand hummocks or other substrate modifications 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.

• Although California least tern nests have not been documented on SSTC-S beaches, the Navy is authorized to deter least terns from nesting there. If any least tern eggs are found, they would be collected and taken to Project Wildlife if feasible. Least tern scrapes may be smoothed over to deter nesting.

1.6.5.6 Continued Site Preparation for Maintenance

• Site preparation, in accordance with the USFWS's BO on the Maintenance and Training Development Program (1980-BO 1-1-80-F-18; 1983-BO 1-1-82-F-123 Navy's Light Airborne Multipurpose Facilities MKIII facilities development program) and the California least tern Memorandums of Understanding, 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 near Zuniga Point and other designated areas as an experiment in the event that the Maintenance and Training site needs to be moved.

• To provide nesting cover for chicks, minimize invasive weeds, and protect rare plants, the locations of coastal woolly-heads (Nemacaulis denudata), and Nuttall's lotus (Lotus nuttallianus), are marked for avoidance prior to grading or herbicide use. Coast woolly-heads and Nuttall's lotus are indicators of a healthy, natural habitat that is conducive to nesting by providing a mosaic of vegetation for chick shelter and escape cover.

No kelp or other natural marine vegetation that collects on beach tidal areas is removed from the oceanside beaches of SSTC-N or SSTC-S. Kelp is managed at YMCA Camp Surf by relocating it to areas where it does not provide an unsafe environment for children. Marine vegetation at YMCA Camp Surf is not buried, but 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 to deter bird-related airstrikes. Areas within and adjacent to the airfield are mowed when 25 percent of the vegetation reaches eight inches or higher, as measured from the soil. The mowing schedule is coordinated with the NBC Botanist and Wildlife Biologist.

• Regular beach clean-up in targeted areas is conducted.

1.6.5.7 Nest Substrate Enhancement

• To provide suitable nesting substrate that does not foster weed invasion that may harm nesting or fledging success, the Navy manages invasive exotic plants. Since iceplant can help dune stabilization and is expensive to remove, 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.

1.6.5.8 Signage and Education

• Signs have been posted every 500 ft on the hard-packed sand road that parallels State Route (SR) 75. The signs inform the public of the need to avoid designated nesting locations of snowy plovers or least terns on the beach.

• Signs are also placed at South Delta, such as the large sign providing information about least terns. Most plover areas also include a sign to explain the blue stakes.

• Signs are provided by State Parks in some years to help manage 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.

1.6.5.9 Recreational Use Restriction

• The Navy works to eliminate recreational or casual use of the beaches by military personnel and their dependents who live in 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 non-military civilian use of nesting beaches through security patrols and guards. Signage, fencing, public awareness campaigns, and enforcement are all necessary to achieve successful control.

1.6.5.10 Rearing of Collected Eggs, Injured and Sick Individuals

• All injured or sick individuals are taken to a wildlife rehabilitation center, such as Project Wildlife, for rehabilitation.

• Least tern eggs that have been collected are provided to Project Wildlife or Sea World, as appropriate, for hatching and rearing. Terns were captively reared in 2002 and 2003, after the eggs were collected, to discourage nesting on the operational beaches. The least tern chicks were very difficult to raise, whereas snowy plover chicks, which are precocial, were easier to raise. Tern survival after rehabilitation was minimal. All chicks were 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.

1.6.5.11 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. In 2006, 11 sick and 21 dead adult snowy plovers were found in the County of San Diego, including 16 from the oceanside beaches of NAB Coronado. Four snowy plovers were found dead at NBC in 2007, three adults and one fledgling. Only one snowy plover was found dead on NBC in 2008, an adult.

1.6.5.12 Monitoring for Effects and Adaptive Management

• California least terns and western snowy plovers 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, numbers of nests and eggs collected, the hatch date of each egg collected, the unique band combination given to each captive-reared chick, the approximate fledgling date, and the release date and location of each fledgling, and suggestions to improve the efficacy of this process if used in future years. This information is necessary to assess the amount of incidental take and the effectiveness of using this approach to minimize impacts.

• Biological monitoring of the least tern and the snowy plover during the breeding season is performed by qualified and USFWS-permitted experts at all nesting sites. The general schedule for monitoring is provided below, but is modified based on findings in the field and operational requirements.

o NAB Coronado Ocean Beach: Monitoring for least terns and snowy plovers is conducted three to four days each week from March 1st to April 15th, five to six days per week from April 15th to August 1st, and three to four days per week from August 1st-August 31st.

o NAB Coronado North and South Delta Beach: Monitoring for least terns and snowy plovers is conducted three days a week from April 15th to April 30th, four to five days a week from April 30th to July 31st, and three days a week from July 31st to August 31st.

o Monitoring for snowy plover occurs one day per week from September through February.

o Monitoring at SSTC-S for snowy plovers is conducted one to three days a week from March 1st to mid-September (and one day per week during the winter).

• Least tern and snowy plover adults and chicks are banded 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 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.

1.6.5.13 Long-term Site Enhancement Plan

• Develop a site enhancement plan that would include establishing dunes on the windward (west) edges of Delta North and South that would enhance this area for plovers, creating a source of sand for the least tern nesting area, and establishing a better visual barrier between SR-75 and the nesting colony. This plan could be developed as a part of the NBC Integrated Natural Resources Management Plan revision.

1.6.5.14 Vehicle Patrolling and LARC V Operator Training

• Vehicle patrolling and LARC V Operator training would not occur in Red, Blue, or Orange Beach Lanes during the nesting season.

The Navy acknowledges the sensitivity of the 3 southernmost STCC-N beach lanes to for least tern and snowy plover nesting, and the Navy intends to only use these areas during the nesting season when no alternatives are available. The proposal includes criteria which would need to be met before expanded training into STCC-N Beach Lanes Blue 2, Orange 1, and Orange 2 (Exhibit 12). The Navy describes these criteria as follows:

> *The first criterion is driven by an operational need for training lanes. It allows use of Blue 2, Orange 1, and Orange 2 when a training lane(s) is needed and other suitable training lanes are already occupied and unavailable for use. Under this criterion, SSTC-N Beach Lanes Blue 2, Orange 1, and Orange 2 could be used during the nesting season if Beach Lanes Red 1 and 2, Green 1 and 2, and Blue 1 are being used and additional training lane(s) are needed for training. Beach Lanes would be opened one at a time, based on need, with Blue 2 opened first, Orange 1 second, and Orange 2 last, where such selection would maintain the realism of training and training needs.*
>
> *Under the second criterion, training would be conducted in Blue 2, Orange 1, and Orange 2 if attributes of those lanes make them more suitable for meeting training needs than other available training lanes. Examples of lane attributes which may allow use of Blue 2, Orange 1 and Orange 2 include, but would not necessarily be limited to: nearshore in-water conditions such as the presence of sand bars or holes, beach conditions such as slope and depth of the beach, distance from other training activities occurring on SSTC-N Oceanside beach and boat lanes, and a need for diversity in training locations.*

Concerning the San Diego fairy shrimp, which live in vernal pools at STCC-S (at the Naval Radio Receiving Facility (NRRF), and that are currently off-limits to training (Exhibit 7)), the Navy's mitigation commitments include limiting training activity within the pools to foot traffic, and only then when vernal pools are dry.

Additional least tern, snowy plover, and San Diego fairy shrimp/vernal pool mitigation measures are contained in the Fish and Wildlife Service's Biological Opinion. The Terms and Conditions of that Opinion, which are mandatory, are shown on Exhibit 13. To summarize, the terms and conditions require:

For Least Terns and Snowy Plovers:

1. Consider tide conditions and schedule training on the hardpack during low tides to the maximum extent consistent with training needs.
2. Mark and buffer up to 22 concurrent snowy plover nests, *plus* any additional plover nests in beach lanes Orange 1 and 2.
3. If nest relocations are needed, relocate them the shortest distance possible and use FWS-approved monitors, with weekly reporting to FWS.

4. Brief dog handlers of nest protection guidelines, and if dog conditioning is needed on soft pack sand, use the sand road (east of nesting areas) or stay within 20 ft. of hard pack sand.
5. Avoid dog conditioning in the 3 southern STCC-N lanes until after completing and coordinating with FWS a study evaluating the effects of military working dogs on terns and plovers.
6. Limit dog training across the beach and inland to beach lanes Yellow 1, and the northern half of Yellow 2, and Green 1 and 2, pending completion of the above-mentioned study.
7. Coordinate with FWS and submit for its review and approval the design and scope of work for this dog training study, as well as for the Long Term Habitat Enhancement Plan for STCC.
8. Submit annual reports to FWS detailing monitoring, impact, and remediation measures for least terns and snowy plovers.
9. Assure the biological monitors look for and document the location lf lest tern or snowy plover nests, eggs and chicks before and after all training exercises, to allow assessment of take.

For San Diego Fairy Shrimp

1. Avoid occupied vernal pools when designing parachute drop zones, including 30 m buffers.
2. To the maximum extent consistent with training need, avoid the occupied vernal pools and their watersheds.
3. Avoid vernal pools 1-7 (Exhibit 7) year round to the maximum extent consistent with training need (using markers, maps, GPS coordinates, or any other means consistent with training needs).
4. Keep military dogs out of vernal pools year round.
5. Mark pools to facilitate monitoring, determine baseline conditions and San Diego fairy shrimp distribution and abundance (and related conditions important to the species), submit a draft monitoring plan for FWS review and approval, including maps of training areas, vernal pools and their watersheds, focused vegetation, topography, hydrology, water quality, and fairy shrimp surveys, protocols and methodology for determining when vernal pools are to be considered “dry,” monitoring plans to address training impacts (including remediation measures if impacts are detected), submit annual reports to FWS, completion of baseline monitoring before any training occurs in or around the vernal pools, and implement measures identified in annual monitoring reports.

In addition to these requirements, as is standard practice, the FWS has included “Conservation Recommendations,” which are discretionary but are recommended to help assist listed species recovery efforts. These recommendations are contained in Exhibit 14 and include:

1. Continue to mark and avoid suitable nesting habitat in the 3 southernmost STCC-N lanes, marking nests in a manner that accommodates linear travel parallel to the shoreline, and if markers need to be temporarily removed to allow a training activity, allow their temporary removal.
2. Continue to mark all plover nests at STCC-N and STCC-S with a buffer and avoid the buffered nest sites until approximately 2 weeks after eggs hatch. If this cannot be accomplished, adjust the size and configuration of buffers to better accommodate training OR move nests out of beach crossing lanes in a manner gradually relocating nests away from training areas.
3. Implement stricter controls over public use of STCC-S that affects tern and plover nest areas, improve identification and enforcement of base boundaries to lessen public use in non-training areas, including signs, kiosks, education, citing violators, monitoring violations, fencing (parallel to Rte. 75) to deter trespass, coordinating with State Parks and local enforcement personnel, and hire a security guard or warden.
4. Develop a Long Term Enhancement Plan for STCC and Delta beaches that includes remediation efforts for South Delta Beach MRP Site 5.[3]
5. Re-establish a "no dogs" rule at the NASNI Lodge beach, and confine military dogs at the lodge to beach use at the adjacent downcoast beach (Coronado Dog Beach).
6. Reduce foot traffic at the western end of NASNI beach, using signs, delineation, and enforcement of existing restriction on access in plover nesting areas, and, if needed, install a fence.
7. Work with the Army Corps to add sand to the narrow western end of the NASNI beach.
8. Explore the potential for acquisition or lease of land adjacent to STCC for conservation/buffer values.
9. Fence the boundaries of San Diego fairy shrimp occupied vernal pools.

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

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

10. Due to uncertainties in the Navy's training models, submit annual reports to the FWS describing the actual training events, including timing, number, type, and distribution for activities during the least tern/snowy plover nesting season, "to the extent consistent with national security," which would allow a better correlation between training activities and nesting distributions and success.

The Navy has not, as of the date of this writing, indicated whether it intends to implement some or all of these recommendations.

Based on incorporation of the terms and conditions summarized above, the FWS estimates take and concludes as follows:

Least Terns

1. Up to 8% of the least tern eggs/chicks at SSTC-N Beach per year may be injured, abandoned, or killed due to training activities.
2. Up to one least tern adult per year may be killed or injured during night time training activities at STCC-N.
3. Up to 10 least tern nests (20 eggs) per year may be moved small distances to reduce the potential for effects.

Snowy Plovers

1. Up to 1 active nest/yr. will be destroyed by training activities at STCC-N and STCC-S and result in injury or death of the nest's eggs or chicks.
2. Up to 5 snowy plover chicks will be killed or injured/yr. by training at STCC-N and STCC-S.
3. Up to 3 snowy plover nests (9 eggs)/yr. at STCC-N and STCC-S will be moved small distances to reduce the potential for effects from training or to avoid excessive tides.
4. Up to 3 nests (9 eggs)/yr. will be abandoned for unknown reasons and be brought into captivity for incubation, rearing, and release onto action area beaches.

San Diego Fairy Shrimp

1. Foot traffic in occupied vernal pools will impact <1% of the vernal pool complexes known to be occupied by the San Diego fairy shrimp throughout this species' range.

The Fish and Wildlife Service concludes:

Least Terns

1. The status of the least tern has significantly improved since its listing in 1970; the Navy has contributed to this improvement by successfully managing its sites; rangewide population estimates have increased to an estimated 7,124 pairs in 2009; and the FWS has recommended downlisting the species from endangered to threatened.
2. The proposed scheduling with heavier use towards the areas with fewer nests when it does not impact training needs "… are anticipated to maintain the suitability of least tern habitat at this location over the long term."
3. The number of least terns injured or killed annually from training should "… be small relative to the overall least tern population throughout its range and is not expected to result in an appreciable reduction in the numbers, reproduction, or distribution of the least tern."
4. The Navy will incorporate site enhancement (at Delta beaches), predator management, population monitoring, a Long Term Enhancement Plan, and efforts to reduce recreational trespass, which will help "… maintain the suitability of least tern habitat within the action area over the long term."
5. "We expect the percentage of the U.S. rangewide least tern nests initiated on the SSTC-N Beach and the Delta Beaches to remain within the range observed from 2005-2009" (i.e., 7-13.6%, averaging 11.3%; and 4.6-8.1%, averaging 6.0%, respectively).

Snowy Plovers

1. The estimated death or injury of 1 active nest and 5 chicks per year would be <0.1% of Pacific coast snowy plover populations/yr.; "…this low-level impact is not expected to result in an appreciable reduction in the numbers, reproduction, or distribution of the Pacific coast population of the western snowy plover."
2. "Although the suitability of beaches within the action area is likely to be reduced as a result of the proposed action, we anticipate that western snowy plovers will continue to use beaches within the action area for breeding, foraging, and wintering."
3. The Navy has incorporated "ongoing predator management and population monitoring that support recovery of the snowy plover.

San Diego Fairy Shrimp

1. San Diego fairy shrimp cysts are likely to: 1) be crushed or carried out of the occupied vernal pools by foot traffic during dry periods; and 2) fail to hatch or complete their life cycle due to changes in pool hydrology, salinity and invasive plant cover. Fairy shrimp in pools 5 and 20 may also be crushed, and cysts may

> be crushed or carried out by infrequent emergency/security vehicle traffic [note – these 2 pools lie within an unpaved road]. Estimating the number of cysts that may be affected is difficult, but limiting effects to the dry period, "… we anticipate that the overall loss of fairy shrimp cysts will be small and that all occupied pools will continue to support viable fairy shrimp populations. Thus, the take threshold will be exceeded if monitoring reveals that training impacts [are occurring] … in a manner that could lead to the extirpation of fairy shrimp in any individual pool."

Based on the anticipated "take" level, the FWS has issued its "No Jeopardy" opinion, stating:

> *In the accompanying biological opinion, we determined that the level of anticipated incidental take of California least terns, western snowy plovers, and San Diego fairy shrimp is not likely to result in jeopardy to these species.*

In the context of species' recovery efforts, the FWS states that for least terns, STCC-N and Delta Beaches "… will continue to support abundant least tern nesting activity and thereby continue to make a substantial contribution to the recovery of the species." For snowy plovers, FWS states that the proposed training:

> *… is not expected to preclude recovery of the plover. However, it is expected to reduce the likelihood of future population growth within the action area due to the cap placed on nest avoidance (i.e., 22 concurrent nests) and the projected increase in human activities. Thus, the proposed action may necessitate additional conservation efforts within the action area or in other parts of Unit 6 to allow for population increases that meet the recovery criteria for Unit 6….*

For fairy shrimp, the FWS states that, as noted above: "… we expect that the currently occupied pools will continue to support viable fairy shrimp populations in support of recovery of the species."

The Commission finds that, given the information provided, it is clear that the Navy's extensive conservation and adaptive management efforts to date have contributed greatly to the population levels of least terns, snowy plovers and San Diego fairy shrimp in the project area. Nevertheless, the Commission notes that: (1) all three species remain at serious risk of extinction; (2) ongoing threats to these species, including relatively recent threats from predation by gull-billed terns, climate change and sea level rise, pose further risks to their survival; and (3) the areas currently off limits to training but proposed for expansion of training are regionally highly significant and particularly important for each of the three species. While overall least tern populations are up, reproductive success numbers for the past 20 years are troubling, particularly in the San Diego area (see Exhibits 9-10: Exhibit 9 (DFG Figure 2), which compares statewide least tern populations to fledging rates, Exhibit 10 (DFG Table 3), shows and regional fledgling/pair comparisons).

Local least tern and snowy plover contract consultant biologist, Elizabeth Copper, points out in her letter commenting on the Navy's EIS (Exhibit 16) that:

> *Since 2001, Least Tern reproductive success in San Diego County has been declining with the steepest drops being seen at sites around San Diego Bay. This downward population trend is not addressed in the EIS. Methods for calculating population figures are under review and are relevant to providing a clear picture of the status of the species prior to approval of increased adverse effects. In 2009, only 72 young least terns fledged from Naval Base Coronado sites from 3,232 eggs laid and 2,364 chicks hatched. The losses are in no way attributable to the Navy, which has been diligent in attempting to reduce the predation that is the primary cause of these losses but it is nonetheless in this context that increased take is being sought by the Navy. It is NBC's 22 percent of the statewide population that suffered near complete reproductive failure in 2009. Both the increasing reliance on NBC and San Diego County military facilities to support the tern population and the declining populations at these sites suggests a need for the most diligent evaluation of projects that may adversely affect these birds. The status of the tern population and its current instability is information that is fundamental in an adequate environmental document. An emergency update of the California Least Tern Recovery Plan would serve the Navy and the public well by addressing the dynamic population numbers of the Least Tern and reconciling inconsistent interpretations of the status of the species.*
>
> *In 2009, NBC supported almost one third of the snowy plover nesting population in San Diego County. Unfortunately, while the population numbers have wavered , breeding bird survey results in 2009 showed the entire coastal population from Washington to San Diego to be down by 12 percent from what was recorded in 2005 despite aggressive management efforts throughout the range. The minimum number of pairs at NBC in 2009 was only 35. In addition to problems of predation and habitat loss, in San Diego there has been a continuing occurrence of unexplained adult mortality with 15 adults found sick or dead at NBC in 2009 alone. This gloomy context needs to be clearly provided in the EIS to enable the public to evaluate the potential consequences of project approval. The breeding population goals identified in the 2007 Recovery Plan are far from being met in Southern California's Recovery Unit 6 with the only areas moving toward those goals being those that will be affected by this project proposal.* [Emphasis added]

Snowy plover numbers have not been increasing but have stayed relatively constant since 2005, and statewide populations have decreased since 2005. Over 97% of vernal pools in San Diego County have been destroyed, and since its listing, San Diego fairy shrimp populations have not increased. The areas proposed for increased training are the same areas that are the *most* productive on Navy San Diego Base lands for least terns, snowy plovers, and San Diego fairy shrimp. The heaviest nesting of least terns and snowy plovers occurs in the 3 southernmost STCC-N lanes, and the vernal pools at STCC-S are the *only* area in the greater project area where San Diego fairy shrimp exist.

The Navy does not disagree that these areas provide important habitat, which is at least part of the reason the Navy has agreed, to date, to keep these areas off limits to training activities (seasonally for the tern/plover nesting, and year-round for the vernal pools). Thus, there appears to be a general consensus within both the Navy and the Fish and Wildlife Service that there is a continuing need to protect these areas. The Navy intends to use these areas for training only when no alternative areas are available, and, hopefully, sparingly. The key questions before the Commission are, therefore:

(1) whether the Navy's models accurately estimate whether, and if so when, increased training will need to be located within these areas;

(2) whether the Navy's criteria for when these areas would need to be used are sufficiently specific and limited to assure they would only be used when adequate measure are in place to protect sensitive species;

(3) whether the artificial "cap" on plover nests (no more than 22 nests would be protected) is warranted and adequate to protect nesting snowy plovers;

(4) whether training cannot be conducted without avoiding vernal pools containing San Diego fairy shrimp year-round, rather than just during the wet season, and, if not, whether the species can tolerate the impact of such training; and

(5) whether the process for a to-be-determined study addressing dog training in the 3 southernmost STCC-N lanes is adequate at this time to enable a determination that the training will avoid or minimize effects on plovers and terns.

The Commission finds that, as proposed by the Navy (including as conditioned by the Fish and Wildlife Service), the proposed expansion of training into these highly sensitive and regionally important habitat areas would not be consistent with the requirements of Section 30240 of the Coastal Act to protect environmentally sensitive habitat areas against any significant disruption, to be limited to only uses dependent on those resources, and to be compatible with the continuance of these habitat areas. The Commission both appreciates the Navy's ongoing efforts to protect species, and understands that bird nesting has continued in all beach lanes even with Navy training occurring during the nesting season (other than in the southernmost 3 beach lanes). However the Commission also believes that the areas previously off-limits, but now proposed to include training, are regionally important refuges for these species.

The Commission further finds that none of these species' recovery efforts have been sufficiently successful to provide much comfort that species affected can tolerate additional adverse impacts, especially given the above noted, relatively new and confounding threats from predation by gull-billed terns and climate change/sea level rise. Combined with this concern, the Commission further believes that it is premature *at this time* to authorize

expanded training into these areas for logistical military reasons that include an assumption that cessation of war efforts overseas will occur *and* will be accompanied by an increase in training area needs. The Commission has not been provided with the inputs to the Navy's model that project such increased needs.

However, the Commission finds that *actual* needs rather than needs based on a hypothetical model should be the determinant as to whether the Navy truly does need to expand into any or all of these areas. Accordingly, the Commission finds that it is unable at this time to agree with the Navy that training expansion into these areas is needed. The Commission is therefore adopting Condition 1 (page 16), which, if agreed to by the Navy, would result in the Navy returning to the Commission with a supplemental consistency determination when expanding training into the identified sensitive areas to demonstrate whether such expansion is in fact needed, accompanied by further analysis describing:

> *(1) the least tern and snowy plover populations at that time, including the extent to which the snowy plover populations in the area's recovery unit (RU-6) has reached the Management Potential Breeding Number (under the U.S. Fish and Wildlife Service 2007 Recovery Plan (or whichever Recovery Plan is current at that time)); (2) an [up-to-date] explanation as to why training in these lanes during the nesting season is necessary (i.e., why it could not feasibly be conducted at alternative locations or time periods); and (3) a[-n up-to-date]description of the monitoring and avoidance measures that will be incorporated into any such training events.*

Providing such updated and more realistic information would afford an additional benefit. To date the Commission not been provided, as is its usual expectation, with the comments on the Navy's EIS and the Navy's responses to the EIS comments. The Commission notes that while the CZMA and the National Environmental Policy Act (NEPA) mandate legally separate processes, it is clearly the *intent* of NEPA is to provide complete information to decisionmakers.[4] Where CZMA issues and NEPA issues overlap, as is the case here, the Commission has typically had the benefit of NEPA comments and responses (or at a minimum, draft responses) before acting on consistency determinations.

The Commission also finds that four additional conditions are necessary before the Commission could find the proposal consistent with Section 30240. Compliance with these conditions (also page 16), would also result in the Navy agreeing to: (1) protect all snowy plover nests (not set a cap at 22 nests), with the potential for Commission staff authorization/concurrence of specific instances of nest/buffers removals or relocations *temporarily* to accommodate a necessary training event; (2) assure dog training in the three

[4] As NOAA notes in the preamble to the 2001 federal consistency regulations [FR Dec. 8, 2000. (Vol. 65, No. 237)]: "… how the State coordinates with NEPA documents is not proscribed by the CZMA. The CZMA and NEPA are two separate statutes with distinct requirements. Often consistency reviews are coordinated through NEPA documents as a matter of administrative convenience and also to provide environmental information to support a consistency determination. NOAA encourages such practice, as previously discussed in the preamble to the proposed rule under proposed section 930.37."

southernmost STCC-N Beach Lanes, the terms of which are still being worked out between the Navy and the FWS, will not occur until the Commission agrees to the adequacy of the to-be-agreed-upon plan and management measures; (3) avoid training in all San Diego fairy shrimp-occupied vernal pools, year-round; and (4) provide the Commission staff with all monitoring reports prepared for the Fish and Wildlife Service. The Commission concludes that, if the Navy were to agree to implement these conditions, the proposed training could be found consistent with the requirement of Section 30240 of the Coastal Act.

B. Marine Resources. Section 30230 of the Coastal Act provides:

> *Marine resources shall be maintained, enhanced, and where feasible, restored. Special protection shall be given to areas and species of special biological or economic significance. Uses of the marine environment shall be carried out in a manner that will sustain the biological productivity of coastal waters and that will maintain healthy populations of all species of marine organisms adequate for long-term commercial, recreational, scientific, and educational purposes.*

The Navy's consistency determination analyzed marine resource effects, which could occur primarily from underwater detonations, temporary logistics-over-the-shore training activities (e.g., pile-driving), and amphibious landings. These activities would be of short duration, but each has the potential to affect eelgrass, commercial and recreational fish stocks, sea turtles, and marine mammals. Effect on eelgrass would be limited to the bayside (Bravo Beach) and nearshore oceanside waters, where vessel landings could result in damage to eelgrass. The Navy conducts extensive ongoing eelgrass monitoring, as well as successful restoration impacts for eelgrass affected from past Navy projects, throughout San Diego Bay, through its Navy Eelgrass Mitigation Sites (NEMS) program. The Navy states the Bravo Beach activities could affect 1.13 acres of eelgrass, which the Navy commits to mitigating, regardless of whether the effects occur. Typically the Navy mitigates eelgrass at a 1.2:1 ratio, which the Commission has found acceptable in past Navy San Diego area projects, given the proven success of the program. The Navy will continue to survey for eelgrass impacts and to mitigate any losses at the same ratio.

The Navy states that the expected approximately 415 underwater detonations per year: (1) will be limited to sandy bottom substrate areas; (2) will avoid eelgrass beds; (3) will, with one exception, be limited to single detonations per training event (the exception is the Dive Platoon and Mine Neutralization activities, which would occur 12 times per year); and (4) would be limited to use of small charges (see Table 3-2 below).

Table 3-2:
Underwater Detonations under the Proposed Action

Training Activity	NEW1 (pounds [l	Detonations/ Operation	Water Dept (feet [ft])	Charge Dep	Tempo	SSTC OPAREA
MCM3	10 to 20	1	≤ 72	Mid	29 ops/year (y	Boat Lanes 1 - 14
MCM	10 to 20	1	≤ 72	Bottom	29 ops/yr	Boat Lanes 1 - 14
Floating Mine	≤ 5	1	≤ 72	Surface (≤ 5 ft	53 ops/yr	Boat Lanes 1 - 14
SWAG4	15 grams (g	1	10 - 20	Mid	74 ops/yr	Echo
SWAG	15 g	1	10 - 20	Mid	16 ops/yr	Boat Lanes 1 - 14
UUV Ops5	10 to 15	1	10 ≤ 72	Bottom to 10 f from surface	4 ops/yr	Boat Lanes 1 - 14
MMS Ops6	13 & 29	2	10 ≤ 72	Bottom	8 ops/yr	Boat Lanes 1 - 14
MMS Ops	13 & 29	1	24 ≤ 72	Bottom to 20 f from surface	8 ops/yr	Boat Lanes 1 - 14
Dive Platoon1(	3.5	8	30 - 72	Bottom	8 ops/yr	Boat Lanes 1 - 14
Qual/Cert7	12.5 - 13.75	2	10 - 72	Bottom	8 ops/yr	Boat Lanes 1 - 14
Qual/Cert	25.5	1	40 - 72	Bottom to 20 f from surface	4 ops/yr	Boat Lanes 1 - 14
Training Activ	NEW1 (pounds [lb]	Detonations/ Operation	Water Depth (feet [ft])	Charge Depth	Tempo	SSTC OPAREA2
NSW Demo Training	≤ 10	1	≤ 24	Bottom	4 ops/yr	Boat Lanes 1 - 14
NSW Demo Training	≤ 5	1	≤ 24	Surface	8 ops/yr	Boat Lanes 1 - 14
SDV/ASDS8	≤ 10	1	≤ 24	Bottom - Mid	40 ops/yr	Boat Lanes 1 - 14
Mine Neutralization	3.5	8	30 - 72	Bottom	4 ops/yr	Boat Lanes 1 - 14
UUV Neutralization	3.3 & 3.57	2	10 - 72	Bottom to 10 f from surface	4 ops/yr	Boat Lanes 1 - 14
AMNS9	3.53	1	40 - 72	Mid - Bottom	10 ops/yr	Boat Lanes 1 - 14

(1) NEW: Net Explosive Weight, (2) OPAREA: Operating Area, (3) MCM: Mine Countermeasures, (4) SWAG: Shock Wa Generator, (5) UUV: Unmanned Underwater Vehicle, (6) Marine Mammal Systems, (7) Qual/Cert: Qualification or Certification trials, (8) SDV/ASDS: Sea, Air, and Land (SEAL) Delivery Vehicle/Advance SEAL Delivery System, (9) AMNS: Airborne Mine Neutralization System, (10) Sequential charges are conducted less than 10 seconds apart or greater than 30 minutes apart.

The Navy also proposes underwater detonations in the bayside, approximately 74 times per year (Echo area (Exhibit 1)); however those detonations would be exceedingly small (i.e., > 15 grams). For those, the Navy states: "Some populations of fish may be affected by acoustic pressure, but most fish would be temporarily displaced, not killed, by detonations of underwater explosives in San Diego Bay."

For the oceanside detonations, the Navy estimates fish density to be 0.08/sq. ft., which would lead to 80 fish within a 1000 sq. ft. area. The Navy states:

> *… it would be conservative to assume that small fish (i.e., Pacific sardines < 0.5 pound [lb]) within 360 yards (yd) (1,080 ft) of the largest underwater detonation would suffer one percent mortality, according to effects criteria defined in Table 3-3. Realistically, it could be assumed that nearly half the fish in the area surrounding an underwater detonation would not have swim bladders. Species without swim bladders would not likely be affected outside of the immediate area of the blast (30 ft), based on Goertner et al. (1994). A substantial portion of the fish would weigh more than 0.5 lb, and thus would be less affected.*
>
> …
>
> *Overall impacts on specific fish species and assemblages under the Proposed Action would remain temporary and localized, considering the expansive nature of the adjacent habitat, the population size and dispersed nature of potentially effected fish populations, and the frequency of the largest underwater detonation activities (less than 24 29-lb detonations per year). In addition, underwater detonation activities in the SSTC Region of Influence would not measurably disrupt behavior or migration patterns of fish species so as to impact populations of fish species.*
>
> ***Summary***
> *Underwater detonations would have a minimal effect on commercial and recreational fish stocks. Effects of underwater detonations would be limited to a zone of about 360 yd from the source, where fish weighing less than 0.5 lb could suffer one percent mortality. There would be underwater detonations in Echo bayside training area from SWAG training activities, but charges would be small (15 g) and would occur in the middle of the water column. Underwater detonations would not substantially affect fish because of the wide range of habitat and the high mobility of fish. The Proposed Action could affect a small number of individual fish, but would not affect the biological productivity of any fish populations. Thus, the Proposed Action would not degrade the current level of fish stocks around SSTC, and is consistent to the maximum extent practicable with Section 30230 with regard to fish.*

Concerning marine mammals, the Navy describes the baseline as follows:

> *Marine mammals expected to be in the SSTC study area include cetaceans (whales, dolphins, and porpoises) and pinnipeds (seals and sea lions). There are no known marine mammal breeding areas in the SSTC study area. Both groups of marine mammals feed and hunt in the ocean, but cetaceans remain exclusively in the ocean, while pinnipeds come ashore to rest and breed. Four species of marine mammals would occur within SSTC: Pacific bottlenose dolphin* (Tursiops truncatus), *gray whale* (Eschrichitus robustus), *Pacific harbor seal (Phoca vitulina), and California sea lion* (Zalophus californianus*). These marine mammals are protected under the Marine Mammal Protection Act (MMPA), but are not listed species under the federal Endangered Species Act (ESA).*

The Navy states that effects from demolitions will be limited to bottlenose dolphins and California sea lions, that only a small number have the potential to be exposed, that the only sea turtle expected in the affected area is the green sea turtle *(chelonian mydas)*, and the probability is very low that it would be encountered, and that adequate monitoring and mitigation measures are in place to assure protection of marine mammals and sea turtles. The mitigation measures include:

1.6.1 Underwater Detonations

1.6.1.1 Marine Mammals and Sea Turtles

The following mitigation measures for underwater detonations, which are situation or location dependent (e.g., substrate type, water depth, charge weights), 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 an unanticipated conflict, human safety considerations would take precedence, and such conflicts are always used to make incremental improvements in the procedures used in subsequent activities. For the charges laid on SSTC oceanside at the locations described, the following mitigation measures would be taken:

A safety buffer zone will be established around each detonation point. For detonations occurring in water depths of 0 to 24 ft, the safety buffer will be a 1,300-ft radius around the detonation point. For detonations occurring in 24 to 72 ft of water, the safety buffer will be a radius of 2,220 ft.

• Two observers (one on the beach and one in a small craft for 0 to 24 ft of water and two in small craft for 24 to 72 ft of water) with binoculars will survey the detonation area and the safety buffer zone for marine mammals or sea turtles from at least 30 minutes prior to commencement of the scheduled explosive event until at least 30 minutes after detonation. Observers will pay extra attention to large amounts of floating kelp strands and other marine debris (if any) within the buffer zone, since these may provide shelter and food for marine mammal prey.

• Navy divers placing charges on mines and dive support vessels will check the area around the mine location for marine mammals or sea turtles.

• If a vessel not associated with the event is sighted in the buffer zone or headed towards it, activities will be suspended until the area is clear prior to detonation.

• If a marine mammal or sea turtle is sighted within the buffer zone or moving towards it, activities will be suspended until the animal has voluntarily left the area and the area is clear of marine mammals or sea turtles for at least 30 minutes for underwater detonations in water depths of 24 to 72 ft and at least 10 minutes for detonations in water depths of 0 to 24 ft.

• Following the detonation, visual monitoring for marine mammals or sea turtles within the buffer zone will continue for 30 minutes. Any animals seen will be observed for signs of injury. Injured marine mammals or sea turtles will be reported to the Commander Navy Region Southwest (CNRSW) Environmental Director, the Pacific Fleet (PACFLT) Environmental Office, and NMFS.

• Sequential detonations will be conducted either less than 10 seconds apart or greater than 30 minutes apart. Multiple underwater detonations will be either less than 10 seconds or more than 30 minutes apart to allow for adequate observation and also to prevent harm to any animals that may come to feed on any potential fish kill.

SWAG training would be conducted in San Diego Bay, as well as SSTC Boat Lanes 1-14, under the Proposed Action. Underwater charges associated with SWAG training (approximately 15 grams NEW) would be smaller than charges used for other underwater detonations. The smaller charges would require a smaller safety buffer zone, and therefore, mitigation measures for SWAG training would differ from other training activities with underwater detonations. To address the possible human and marine organism safety concerns, the Navy would implement additional mitigation measures. For SWAG charges laid bayside on SSTC at the locations described:

• A safety buffer zone of 180 ft would be established around each SWAG detonation point.

• Observer(s) with binoculars and small craft would survey the detonation area and the safety buffer zone for marine mammals or sea turtles from at least 10 minutes prior to commencement of the scheduled explosive event until at least 10 minutes after detonation. Observers would pay extra attention within the buffer zone to large amounts of floating kelp strands and other marine debris (if any), since these objects could provide shelter or food for marine mammal prey.

Divers placing charges on mines and dive support vessels would check the area around the mine location for marine mammals or sea turtles.

• If a marine mammal or sea turtle were sighted within the buffer zone or moving towards it, activities would be suspended until the animal voluntarily left the area and the area were clear of sea turtles and marine mammals for at least 10 minutes.

• Following the detonation, visual monitoring for marine mammals or sea turtles within the buffer zone would continue for 10 minutes. Any animals seen would be observed for signs of injury. Injured marine mammals would be reported to the CNRSW Environmental Director and the PACFLT Environmental Office.

1.6.1.2 Birds

A safety buffer zone will be established around each detonation point. The buffer will consist of a 1,300-ft radius for detonations occurring in water depths of 0 to 24 ft and 2,220-ft radius for detonations in water depths of 24 to 72 ft. Observers (two per activity) with binoculars and small craft will survey the detonation area and safety buffer zone for birds prior to detonations. If flocks of birds or diving birds are sighted within the buffer zone or moving towards it, activities will be suspended until the birds voluntarily leave the area. Immediately following the detonation, visual monitoring for birds within the buffer zone will take place for 30 minutes. Observations will be made for animals with signs of injury; injured animals will be reported to the CNRSW Environmental Director and the PACFLT Environmental Office. Sequential detonations will be conducted either less than 10 seconds apart to reduce the likelihood that birds would be attracted by fish kills or greater than 30 minutes apart to allow for birds attracted by fish kill to vacate the area.

1.6.2 ELCAS/Pile Driving Activities

For training activities that involve pile-driving, the following mitigation measures will be implemented:

• The Navy will monitor a 105-ft safety zone surrounding temporary pile removal activities for the presence of marine mammals before, during, and after pile removal activities. If marine mammals are found in the area, pile removal activities will be halted until the marine mammals have voluntarily left the safety zone.

• Monitoring for marine mammals will take place concurrent with pile removal activities and 30 minutes prior to pile removal commencement. A trained observer will be placed on shore, on the ELCAS, or in a boat at the best vantage point practicable to monitor for marine mammals, and will implement shut-down or delay procedures, when applicable, by calling for shut-down to the hammer operator.

The Navy's marine resource analysis concludes:

The Proposed Action could have reasonably foreseeable effects on eelgrass habitat, fish, marine mammals, and sea turtles. Eelgrass habitat would be affected within the designated training lane within Bravo Beach. Eelgrass losses, however, would be compensated for through the establishment and expansions of NEMS in accordance with the Southern California Eelgrass Mitigation Policy. Individual fish may be affected by acoustic pressure from elements of training activities (i.e., underwater detonations). While a small number of individual fish could be affected, Navy training activities would not impact fish populations in the study area because of the small area affected by underwater detonations. Marine mammals may be affected by acoustic pressure from underwater detonations and ELCAS training activities, but there would be no physiological effects. Implementation of Navy mitigation measures would further reduce the likelihood of acoustic pressure exposure, and there would

> *be no adverse effects on marine mammal populations. Acoustic pressure from Navy training exercises would have minimal to no effects on sea turtles because of their infrequent use of the SSTC study area and the implementation of mitigation measures. The Proposed Action would allow for the continued sustainment of biological productivity of coastal waters and healthy populations of marine organisms, and, therefore, is consistent to the maximum extent practicable with Section 30230 of the CCA enforceable policies.*

The basis for the Navy's marine mammal and sea turtle preclusion areas is based on its methodology for impact assessment contained in the project EIS (excerpts are in Exhibit 17). The full EIS can be found at http://www.silverstrandtrainingcomplexeis.com/EIS.aspx . Based on this methodology, the Navy states (DEIS p. 3.9-29) that:

> *The behavioral harassment threshold is derived by subtracting 5 dB from the 182 dB re 1 mPa^2-s in any 1/3 octave band threshold, resulting in a 177 dB re 1 μPa^2-s behavioral disturbance harassment threshold for multiple successive explosives.*

For very shall marine environments, the Navy then estimated (DEIS p. 3.9-35):

> *Based on the empirical propagation data and iso-velocity model predictions, the mitigation range for physiological disruption (TTS) for exercises with charge-weights of 20 pounds or less of C4 on the bottom and for charge-weights of 3.6 pounds or less off the bottom at SSTC is determined to be a 1,300 ft radius out from the site of the detonation with the shoreward half of the implied circle being truncated by the shoreline and extremely shallow water immediately off shore.*

For pile driving activities, the Navy states (DEIS p. 3.9-38 and p. 3.9-47):

> *Current NMFS criteria (70 FR 1871) regarding exposure of marine mammals to underwater impulsive sounds (e.g., impact pile driving) is that cetaceans exposed to sound levels of 180 dB root mean squared (RMS in units of dB re 1 µPa) or higher and pinnipeds exposed to 190 dB RMS or higher are considered to have been taken by Level A (i.e., injurious) harassment. Marine mammals (cetaceans and pinnipeds) exposed to impulse sounds of 160 dB RMS but below injurious thresholds (i.e, 180 or 190 dB) are considered to have been taken by Level B behavioral harassment. Marine mammals (cetaceans and pinnipeds) exposed to continuous noise of 120 dB RMS (e.g., vibratory pile driving) or above are considered to have been taken by Level B behavioral harassment.*
>
> …
>
> *Using an this estimated RMS measurement of 190 dB re 1uPa at 10 m (33 ft), the circular zone of influence (ZOI) surrounding a 24-inch steel diesel-driven pile can be estimated to have a radius of 1,040 feet for the Level B behavioral harassment*

> *threshold (160 RMS) and 105 feet for Level A injurious harassment for cetaceans (180 dB RMS) and 33 feet for Level A injurious harassment for pinnipeds (190 dB RMS) (Table 3.9-3). It should be noted that ELCAS pier construction starts with piles being driven near the shore and extends offshore. Near the shore, the area of influence would be a semi-circle and towards the end of the ELCAS (approximately 1,200 feet from the shore) would be a full circle. The above calculated area of influence conservatively assumes that all ELCAS piles driven are all driven offshore at SSTC, producing a circular zone of influence.*

For underwater detonations, the Navy states (DEIS p. 3.9-49-50):

> *Underwater detonations occur in shallow water (less than 72 feet) within oceanside training lanes and the shock waves propagate over a mostly homogeneous sand substrate. As presented in Section 3.8.2.3.3 of (Table 3.8-12), underwater detonations would increase measurably from 103 activities under the No Action Alternative to 311 activities under Alternative 1.*
>
> *Based on the modeling approach applied, as discussed in Section 3.9.2.4 and without consideration for mitigation measures, underwater detonations under Alternative 1 would result in the potential for noninjurious (Level B) harassment to cetaceans and pinnipeds, but there would be no potential for injurious (Level A) harassment or mortality. The modeled explosive exposure numbers by species are presented in Table 3.9-78. Specifically, 153 annual exposures to pressure from underwater detonations would result in TTS (Level B harassment). Of these 153 exposures, 98 annual exposures would result in TTS for bottlenose dolphins. Exposures of California sea lions comprise the remaining 55 annual exposures that would result in TTS. Exposures to grey whales and harbor seals are not anticipated due to low species density and the limited zone of influence of the proposed underwater detonations. These exposure modeling results are estimates of marine mammal underwater detonation sound exposures without consideration of standard mitigation and monitoring procedures.*

The Navy then calculated to distance to the onset of impact, based on the various charges to be used, which is provided in Table 3.9-7 (DEIS p. 3.9-51). Without including mitigation measures, the Navy estimates:

> *In addition to possible exposures that could result in TTS, the modeling without consideration of mitigation measures indicates that detonations under Alternative 1 also would result in the potential for 114 nonphysiological behavioral exposures.*

With mitigation measures, the Navy states (DEIS p. 3.9-52):

> *To reduce the potential for behavioral or physiological damage such as TTS or injury, a safety zone would be established around each detonation area. As discussed*

in Section 3.9.3, the current safety zone for 24 to 72 feet of water depth would be increased to 2,220 feet to accommodate the largest Level B behavioral harassment ZOI under Alternative 1 (MMS sequential detonations). The safety zone for VSW underwater detonations (in zero to 24 feet of water), would remain the same. Operations would not be conducted if marine mammals are sited in the safety zone. This type of mitigation would likely prevent animals from being exposed to the loudest explosive effects that could potentially result in behavioral, TTS or PTS and more intense behavioral reactions. Implementation of current mitigation and monitoring procedures in the SSTC, as described in Section 3.9.1.7, would minimize the potential for marine mammal exposures to underwater detonations. With implementation of mitigation measures, it is anticipated that exposures will be primarily behavioral, and are highly unlikely to disrupt overall behavior patterns such as migrating, breeding, feeding and sheltering, of marine mammals in the ROI.

Unlike the open ocean, shallow nearshore areas are easier to monitor. The Navy states (DEIS p. 3.9-55): Similar to existing mitigation measures, the physical topography, the lack of protected species on the range, and the type of Navy training routines allow for exceptionally reliable and effective mitigation procedures. Marine mammal species can be detected within a radius that extends out to the distance at which only the lowest degree of TTS would be expected to occur. That is, the procedures described in this section mitigate the potential for Level A harassment by injury and Level B harassment associated with TTS since explosives are not detonated when protected species are in the area associated with those effects. Mysticetes and large odontocetes are rarely, if ever, present in the shallow offshore waters of the SSTC. Were large marine mammals to approach the area— even far beyond the mitigation zone—they would be immediately obvious to the shore or safety-boat observers. The SSTC ROI is not known to be a preferred feeding site for small marine mammals. Thus, the principal concern is for protection of small odontocetes (dolphins and small whales) and carnivora (sea lions) that only occasionally transit though the site. It follows that the mitigation zones, to be described below, are determined by estimates of the propagated peak-pressure and energy in the 1/3 octave-band of highest energy above 100 Hz—i.e., in the range of hearing of small odontocetes.

The Navy concludes (DEIS, p. 3.9-57):

Modeling estimates for Alternatives 1 and 2 indicate that without implementation of current mitigation measures, 153 annual exposures to pressure from underwater detonations could result in TTS and 114 annual exposures could result in nonphysiological behavioral exposures (Level B harassments). In addition, 18 annual exposures (12 bottlenose dolphins, 6 harbor seals) from pile removal activities could result in Level B harassment. No exposures would result in slight injury, severe injury, or mortality. However, implementation of the current mitigation measures will minimize the potential impacts to marine mammal species in the SSTC.

The Commission agrees with the Navy that the proposed nearshore areas should be far easier to monitor than open ocean areas in areas where the Commission has expressed concerns over Navy monitoring and mitigation protocols. The Commission therefore concludes that because of the greater ability to monitor, because no particularly heavy concentration of marine mammals or sea turtles would be affected by the activities, because of the short duration of the individual training activities, and with the mitigation measures and protocols incorporated into the activities, that the activities would not adversely affect marine resources and would be consistent with Section 30230 of the Coastal Act.

C. Public Access and Recreation. Section 30210 of the Coastal Act provides:

> *In carrying out the requirement of Section 4 of Article X of the California Constitution, maximum access, which shall be conspicuously posted, and recreational opportunities shall be provided for all the people consistent with safety needs and the need to protect public rights, rights of private property public owners, and natural resource areas from overuse.*

Section 30212(a) provides in part:

> (*a) Public access from the nearest public roadway to the shoreline and along the coast shall be provided in new development projects except where: (1) it is inconsistent with public safety, military security needs, or the protection of fragile coastal resources, (2) adequate access exists nearby, or, (3) agriculture would be adversely affected.*

Section 30220 provides:

> *Coastal areas suited for water-oriented recreational activities that cannot readily be provided at inland water areas shall be protected for such uses.*

In addition, aside from the commercial fishing protection afforded under Section 30230, quoted above on page 50, Sections 30234 and 30234.5 underscore the need to protect commercial and recreational fishing opportunities:

> ***30234**. Facilities serving the commercial fishing and recreational boating industries shall be protected and, where feasible, upgraded. Existing commercial fishing and recreational boating harbor space shall not be reduced unless the demand for those facilities no longer exists or adequate substitute space has been provided. Proposed recreational boating facilities shall, where feasible, be designed and located in such a fashion as not to interfere with the needs of the commercial fishing industry.*

> ***30234.5.** The economic, commercial, and recreational importance of fishing activities shall be recognized and protected.*

The Navy's consistency determination notes that while training at SSTC has been occurring for over 60 years, with some training activities requiring temporary public access restrictions for both public safety and military security needs, the proposed expanded training levels would increase the amount of time needed for temporary public exclusions from baseline levels. Currently, public use of SSTC-N beaches is restricted; however, SSTC-S beaches below the mean high tide line are and will continue to be available for public use when not restricted for military training. The Navy states that historically, these restrictions have been rare and temporary, and that local residents are familiar with Navy protocols for these restrictions. For example, when the Navy restricts access for military training, it posts temporary signage and Navy personnel at the boundaries of the training to warn and preclude the public from entering the area. The Navy states:

> *Under the Proposed Action, beach training activities would be conducted within areas designated for military training use. The Navy could temporarily restrict public access below the mean high tide line on SSTC-S Beach Lanes during training activities 5, 16, 18, 24-30, 32, 33, 45, 48, 50, 56-59, 64, 68, 71-76 and N8 (see Table 2-1)*[Exhibit 8]. *A few activities could be conducted within the portion of Alpha bayside training area within the CZ, but training activities would not require public exclusion. Activities affecting public use on SSTC-S Beach Lanes would be conducted 579 times per year. Training activities would be short in duration (typically one to four hours), and typically would require use of one beach lane. Large-scale training activities could require longer and larger beach and water closures.*
>
> *Under the Proposed Action, activities that would require ocean or San Diego Bay access restrictions include training activities 4-7, 9-12, 15, 16, 18, 20, 25-28, 35, 37-42, 44-46, 51-53, 56, 57, 67, 70, 71, N1-N9, and N11 (see Table 2-1). Water use would be restricted for public safety and for the security of Navy equipment, vessels, and personnel used during the training. For instance, the area surrounding where personnel are swimming, diving, or parachuting into the water (approximately 0.5 acre) would be cleared of boats for safety reasons. The area surrounding an underwater explosive (approximately 16 acres) would be cleared prior to detonations for public safety. The areas surrounding hoses that are deployed from ship to shore during Amphibious Bulk Liquid Transfer System (ABLTS) and Offshore Petroleum Discharge System (OPDS) training (approximately 18 acres), and the area of pier installation during Elevated Causeway System (ELCAS) training (approximately 8 acres) would be cleared for public safety and equipment security. The area around a Landing Craft, Air Cushion (LCAC) landing site (approximately 0.75 acre) would also be cleared for public safety.*

The Navy describes access restrictions during activities in oceanside offshore waters as follows:

> *Water use would be restricted for public safety and for the security of Navy equipment, vessels, and personnel used during the training. For instance, the area surrounding where personnel are swimming, diving, or parachuting into the water (approximately 0.5 acre) would be cleared of boats for safety reasons. The area surrounding an underwater explosion (approximately 16 acres) would be cleared for public safety prior to detonations. The areas surrounding hoses that are deployed from ship to shore during Amphibious Bulk Liquid Transfer System and Offshore Petroleum Discharge System (OPDS) training (approximately 18 acres), and the area of pier installation during Elevated Causeway (ELCAS) training (approximately 8 acres) would be cleared for public safety and equipment security. The area around an Air Cushion Landing Craft landing site (approximately 0.75 acre) would also be cleared for public safety.*

The Navy points out that restricted areas would be small compared to the area available for public use, and that out of an approximately 6,000 acre water area, when needed for training less than 0.3 % of SSTC's total water training area would be restricted. The Navy also points out that water conditions are such that the nearshore areas affected are "… areas less likely to be commonly used for recreational activities."

The Navy states:

> *In total, training would require public restriction of less than 0.3 percent of SSTC's total water training area for about 7,500 hours per year under the Proposed Action. Most of the restrictions would occur during business working hours when recreational use is low. Training activities currently overlap in time and would be expected to continue to overlap throughout the year. Based on historical usage and projected increases in training tempo, it's reasonable to assume that three to five training activities may typically overlap in time under the Proposed Action. As such, training would be expected to require public restriction of less than 1.2 percent of SSTC's total water training area for about 2,000 hours per year.*

The Navy will notify the public of necessary restrictions during training activities with underwater detonations, through a Notice to Mariners (NOTMAR). The Navy concludes, with respect to ocean areas:

> *The size of the water area that would be closed for each training activity would be relatively small when compared to oceanside and San Diego Bay waters off SSTC available for the uses described in the Regional Water Quality Control Board's Water Quality Control Plan for the San Diego Basin (Region Water Quality Control Board 2007). In addition, the duration of public restriction for most training activities would be relatively short, typically one to four hours. The public would have several alternative, equally suitable Pacific Ocean and San Diego Bay locations for use during training activities. In addition, the training areas would not be permanently closed; restrictions would be temporary, and areas would be reopened at the*

> *conclusion of training. Areas closed to public use would also differ from training activity to training activity. Permanent loss of water use would not be anticipated for any area of the Pacific Ocean or San Diego Bay. Thus, Navy training activities at SSTC would not be expected to substantially conflict with other uses of Pacific Ocean or San Diego Bay.*

Concerning access in STCC-S beach areas, the Navy states:

> *Training activities 5, 16, 18, 24-30, 32, 33, 45, 48, 50, 56-59, 64, 68, 71-76 and N8 would require temporary exclusive Navy control of public portions of SSTC-S Beach Lanes below the mean high tide line immediately surrounding the training activity for public safety or security purposes. Activities affecting public use would be conducted 579 times per year for selected areas of the SSTC-S Beach Lanes. The increase in training tempo under the Proposed Action would result in an increase from baseline conditions in temporary exclusion from SSTC-S Beach Lanes below the mean high tide line. The Navy, however, has conducted training activities on SSTC-S in the past with little to no adverse effects on public use of the area below the mean high tide line on SSTC-S.*
>
> *Activities listed above often would require one or more beach lanes to be restricted to public access below the mean high tide line. While these activities were being conducted, safety personnel would be stationed as a buffer to keep nonparticipants from harm and to ensure mission security. Typically, when beach access is restricted, it would only be restricted within one Beach Lane, allowing public access below the mean high tide line to other areas of the beach. The Navy's training scheduling would vary, depending on fleet deployment schedules, and would not be limited to any specific days of the year. Beach restrictions would typically last one to four hours; however, on average, these activities would require the beach to be closed for about two hours. One activity, Immediate Action Drills (Activity 59, Table 1-2) could require the beach to be closed for up to eight hours. During Immediate Action Drills, typically one to two beach lanes would be used for training. The public would be restricted from using the beach (to the extent of these two beach lanes); however, they would not be restricted from access to adjacent public beaches. Therefore, the public would have ample access to the beach.*

The Navy concludes, with respect to public access and recreation,

> *The public would continue to have access to the waters off SSTC-N, SSTC-S, and NASNI, as well as to existing public beaches. Some training activities may require temporary restriction of portions of the beach or offshore waters, but these activities typically would be short in duration and confined to a small area. A Notice to Mariners (NOTMAR) would be issued to alert the public if underwater detonations were part of training activities. The Navy's Proposed Action would provide maximum*

access consistent with the public safety needs and the need to protect the natural resources from overuse, and is consistent to the maximum extent practicable with CCA Section 30210.

Concerning effects on commercial and recreational fishing, the Navy states:

[As noted above], [t]raining activities in the SSTC Boat Lanes may require temporary exclusion of the public during specific training activities. The amount of time and area required for temporary exclusion from the area surrounding Navy training activities under the Proposed Action would be as described in Section 3.3.1.2. The Proposed Action would increase training tempo at SSTC, which would require an increase in annual number of hours of temporary public exclusion from baseline conditions. The Navy conducted training exercises in SSTC oceanside offshore and San Diego Bay waters for the last 60 years, with minimal to no effects on commercial or recreational fishing.

The size of the water area that would be closed for each training activity would be relatively small when compared to total SSTC offshore and San Diego Bay waters available for the uses described in the San Diego Basin Plan (Regional Water Quality Control Board 2007). The public would have several alternative, equally suitable Pacific Ocean and San Diego Bay locations that could be used during training activities. Clearance requirements for SSTC offshore training activities range from 100 to 740 yd from the training area. If Navy training activities included underwater detonations, a NOTMAR would be issued. A NOTMAR would inform the public of the potential risks of entering the training area, and would allow fishermen to plan ahead for any potential conflicts. The Proposed Action would not include any established restriction zones or permanent public restrictions or exclusions. Thus, Navy training activities at SSTC would not be expected to substantially conflict with other uses of Pacific Ocean or San Diego Bay.

The Commission agrees that with the Navy that the public restrictions would be temporary, limited to relatively small areas, are necessary for both public safety and military security needs as provided for in Sections 30210 and 30212 of the Coastal Act, and will not adversely affect fishing, recreational boating, or diving. The Commission therefore concludes that the project is consistent with the public access, recreation, commercial and recreational fishing and boating, and diving policies (Sections 30210, 30212, 30220, 30234, and 30234.5) of the Coastal Act.

D. <u>Water Quality</u>. Section 30231 of the Coastal Act provides:

The biological productivity of coastal waters, streams, wetlands, estuaries, and lakes appropriate to maintain optimum populations of marine organisms and for the protection of human health shall be maintained and, where feasible, restored through, among other means, minimizing adverse effects of waste water discharges and

> *entrainment, controlling runoff, preventing depletion of ground water supplies and substantial interference with surface water flow, encouraging waste water reclamation, maintaining natural vegetation buffer areas that protect riparian habitats, and minimizing alteration of natural streams.*

The Navy's consistency determination analyzed water quality impacts from ocean discharges including effects from the use of fuels, engine oil, hydraulic fluids, batteries, flares, explosives, anti-corrosion coatings, and anti-fouling paints. The proposed activities could increase the risk of small fuel leaks or spills. The Navy states that such spills would be cleaned up by on-site personnel, using spill control equipment and supplies stored on Navy vessels, military vehicles, and military facilities, and that "Overall, the quantities of petroleum products leaked or spilled during training activities would be negligible."

The Navy states vessel coatings, which contain copper and other toxic constituents, would have little or no effect on concentrations of these substances in San Diego Bay and ocean waters, in part because training at the SSTC does not affect the number of large Navy vessels stationed in San Diego or the length of time they are present, and because smaller vessels and personal watercraft stored out of the water when not in use. The Navy states impacts from flares and pyrotechnic residues:

> *… would be used in relatively small quantities for selected training activities, and would be scattered over a large area." Although pyrotechnic residues include hazardous constituents, most of them would be present in small amounts or low concentrations, and would be bounds up in insoluble compounds. The residual amounts of pyrotechnics would be small (approximately 0.85 lb per item [DoN 2008]), and would not be expected to affect surrounding biological or physical resources.*

Concerning explosives, the Navy states up to 1,610 lb of explosives are used each year for underwater detonations, but that because the charges would be small (less than 20 lbs.), most of the products of combustion are nitrogen, carbon dioxide, and water). The Navy states:

> *Although combustion would be likely less than 100 percent, and residues of these detonation wastes may remain in the water and sediment, residual explosives would be present in trace concentrations that do not affect water quality. Furthermore, due to ocean circulation, these trace concentrations would immediately disperse throughout a larger volume of ocean waters.*

Mitigation measures incorporated into the training include collecting spent training materials at the conclusion of training activities, avoiding washing causeway pier sections in the ocean, and pumping seawater or potable water during simulated fuel transport training activities rather than using actual petroleum products. The Navy concludes, with respect to water quality:

The Proposed Action would expend small amounts of hazardous materials associated with training activities. These hazardous materials would be mostly consumed during use, and the residual amount of hazardous materials would not occur in sufficient amounts to adversely affect water quality. Ocean circulation would immediately dilute the trace concentrations into large volumes of ocean area, limiting any adverse effects to a very minimal area. Navy training activities would maintain the biological productivity of the SSTC study area as described in Section 3.3.2. Thus, the Proposed Action would maintain the biological productivity and quality of coastal waters for marine organisms and human health, and is consistent to the maximum extent practicable with Section 30231.

The Commission agrees with the Navy, and finds that the proposed activities would be consistent with the water quality policy (Section 30231) of the Coastal Act.

V. SUBSTANTIVE FILE DOCUMENTS:

1. Navy Consistency Determination, Silver Strand Training Complex, Dept. of the Navy, June 2010.

2. U.S. Fish and Wildlife Service Biological Opinion FWS-ADG-08BO503-09FO517, July 7, 2010.

3. USFWS Recovery Plan for the Pacific Coast Population of the Western Snowy Plover (2007).

4. Silver Strand Training Complex, Draft Environmental Impact Statement, Dept. of the Navy, January 2010.

5. Navy Consistency Determinations CD-049-08 and CD-086-06 (Navy Southern California (SOCAL) Range Complex, training exercises) CD-20-95 (Navy San Clemente Island Cable Repair), CD-109-98 (Navy Advanced Deployable System (ADS) Ocean Tests), CD-95-97 and CD-153-97 (Navy, Low-Frequency Active (LFA) Sonar Research, Phases I and II), CD-2-01 (Navy Point Mugu Sea Range testing and training activities), CD-045-89 and CD-50-03 (Navy FOCUS Cable and Cable repairs, San Nicolas Island), and CD-37-06 (Navy Monterey Bay (MB) 06).

6. Legal cases involving Commission application of Coastal Act ESHA policies on non-federal land: Bolsa Chica Land Trust et al., v. The Superior Court of San Diego County (1999) 71 Cal.App.4th 493, 517, Pygmy Forest, supra, 12 Cal.App.4th at p.613.

7. Commission federal consistency cases involving ESHA on federal land: Consistency Determinations CD-049-08, CD-086-06, and CD-2-01, CD-001-82, CD-019-82, CD-11-83, CD-016-83, CD-027-83, CD-020-85, CD-007-86, CD-020-90, CD-61-93, CD-105-95, CD-021-97, CD-065-97, CD-090-98, CD-010-00, CD-106-01, CD-011-02, CD-025-

02, CD-052-02, CD-088-02, CD-060-03 CD-033-04, CD-085-04, CD-090-04, CC-072-05, CD-066-06, CC-018-07, CD-046-07, CD-048-07, CD-014-08, CD-009-10, and CD-026-10.

8. California Least Tern Breeding Survey, 2009 Season, California Department of Fish and Game, 28 June 28, 2010.

9. Birds as Marine Organisms: A Review, David Ainley, Pt. Reyes Bird Observatory, CalCOFI Rep., Vol XXI, 1980.

Exhibits

Exhibit 1a	Navy - Training Areas and Boat Lanes – STCC-N and STCC-S
Exhibit 1b	Navy - Training Areas and Boat Lanes - STCC-N
Exhibit 1c	Navy - Training Areas and Boat Lanes - STCC-S
Exhibit 1d	Navy - Training Areas and habitat areas
Exhibit 1e	Navy - Increased Training Areas for all EIS alternatives – STCC-N
Exhibit 1f	Navy - Increased Training Areas for all EIS alternatives – STCC-S
Exhibit 2	Navy - Helicopter Routes
Exhibit 3	Navy - Activities - Table 1-2 - (location/duration/occurrence)
Exhibit 4	Navy - New activities
Exhibit 5	Navy – Alternatives analysis
Exhibit 6a	Oceanside Lanes and Least Tern nest areas
Exhibit 6b	Oceanside Lanes and Delta Beaches, Least Tern and Snowy Plover Nests, northern half of STCC-N
Exhibit 6c	Oceanside Lanes and Delta Beaches, Least Tern and Snowy Plover Nests, southern half of STCC-N
Exhibit 7	Vernal Pools with and without San Diego fairy shrimp, STCC-S
Exhibit 8	Navy – Table 2-1 - Reasonably foreseeable effects on CZ uses or resources from each training activity
Exhibit 9	DFG - Statewide Least Tern Populations and Fledgling Success since 1970 (from Statewide Survey)
Exhibit 10 broken	FWS BO – Table 10 - Least Tern Numbers and Distribution since 1994, down by Delta Beach and Ocean Lane
Exhibit 11	FWS/Navy - Snowy Plover Populations and Fledgling Success since 1992 on Navy San Diego Bases, broken down by base
Exhibit 12	Navy – Criteria for when Blue 2 and Orange 1 & 2 would be used
Exhibit 13	FWS BO – Terms and Conditions
Exhibit 14	FWS BO – Conservation Recommendations
Exhibit 15	DFG – Least Terns – Regional Productivity by County (from Statewide Survey)
Exhibit 16	Elizabeth Copper, comment letter on Navy EIS
Exhibit 17	Excerpts, Navy EIS Chapter 3.9 – Marine Mammal Effects

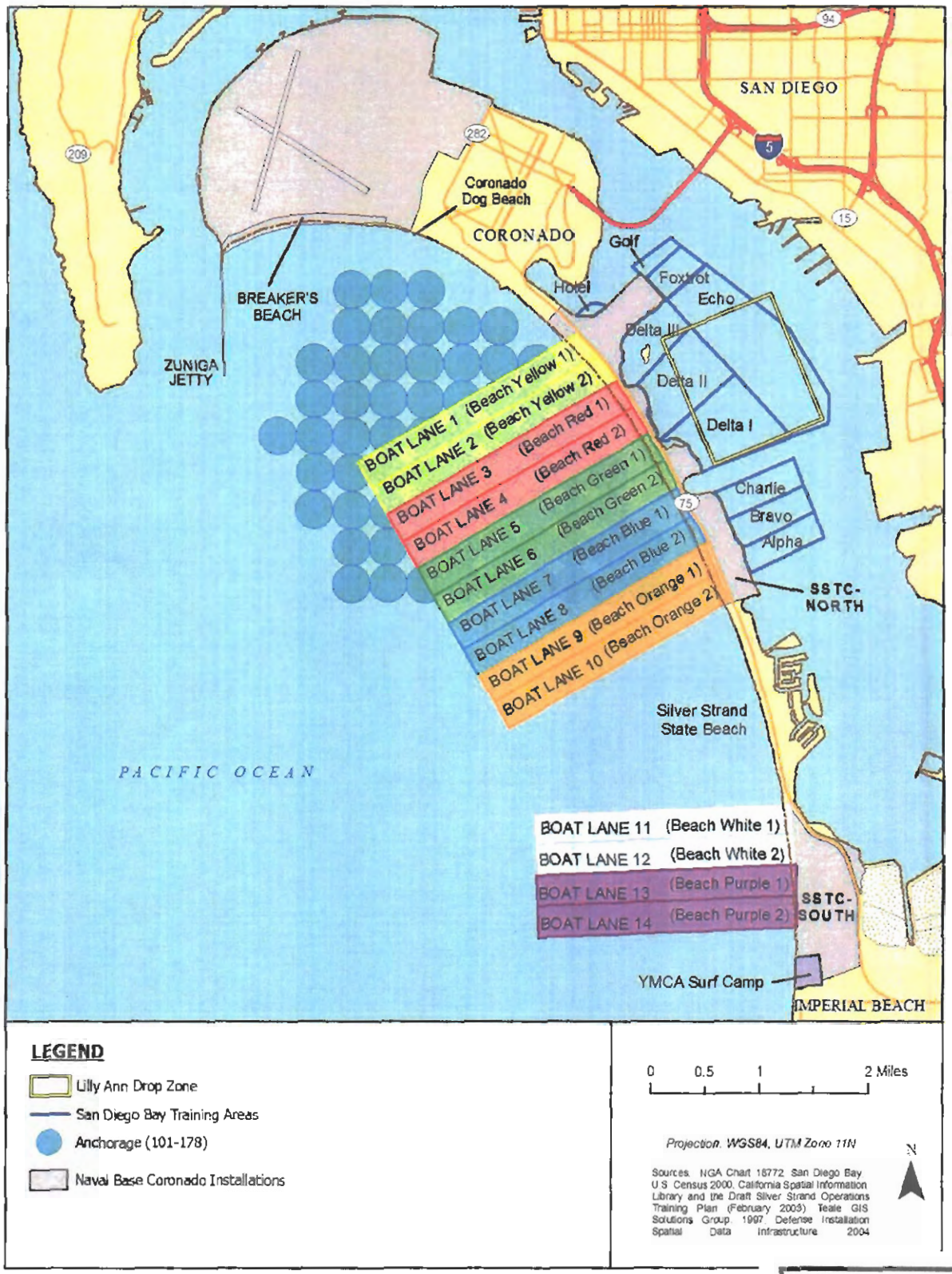


Figure 1-1: Silver Strand Training Complex and NASNI Southern E

EXHIBIT NO. 1a

APPLICATION NO.

CD-033-10

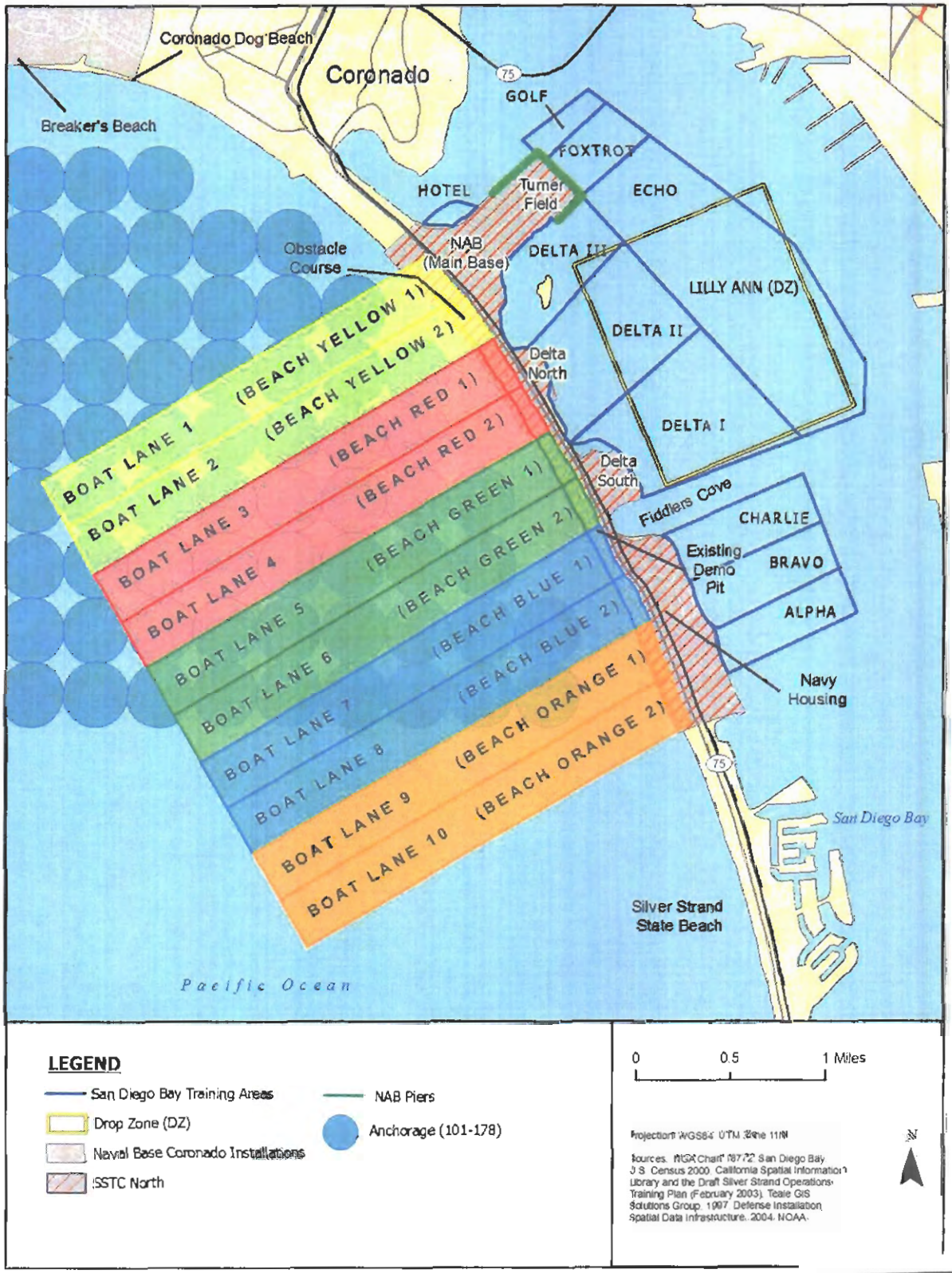


Figure 1-2: Silver Strand Training Complex – North Training Areas

EXHIBIT NO. 11
APPLICATION NO.
CD-033-10

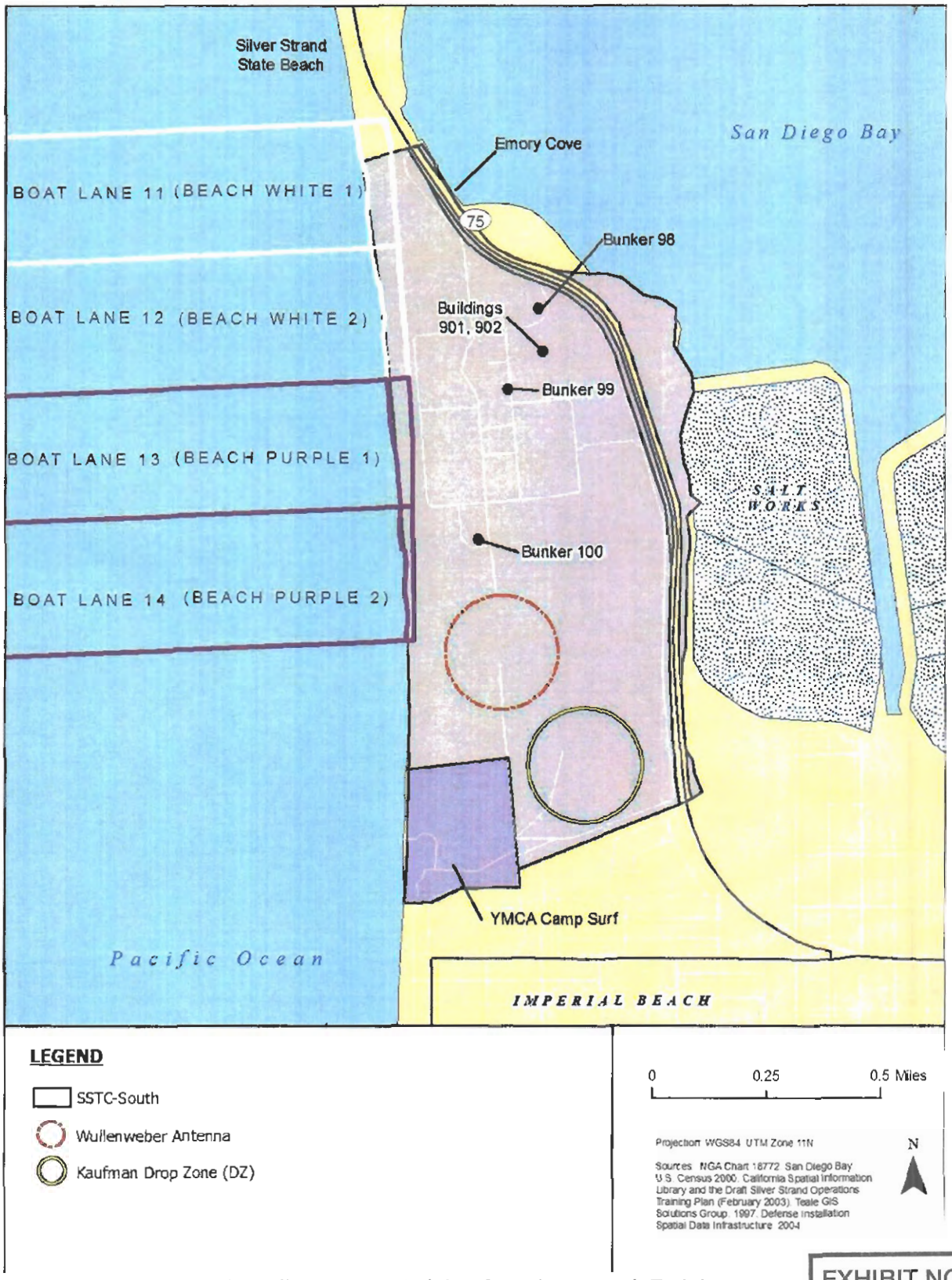
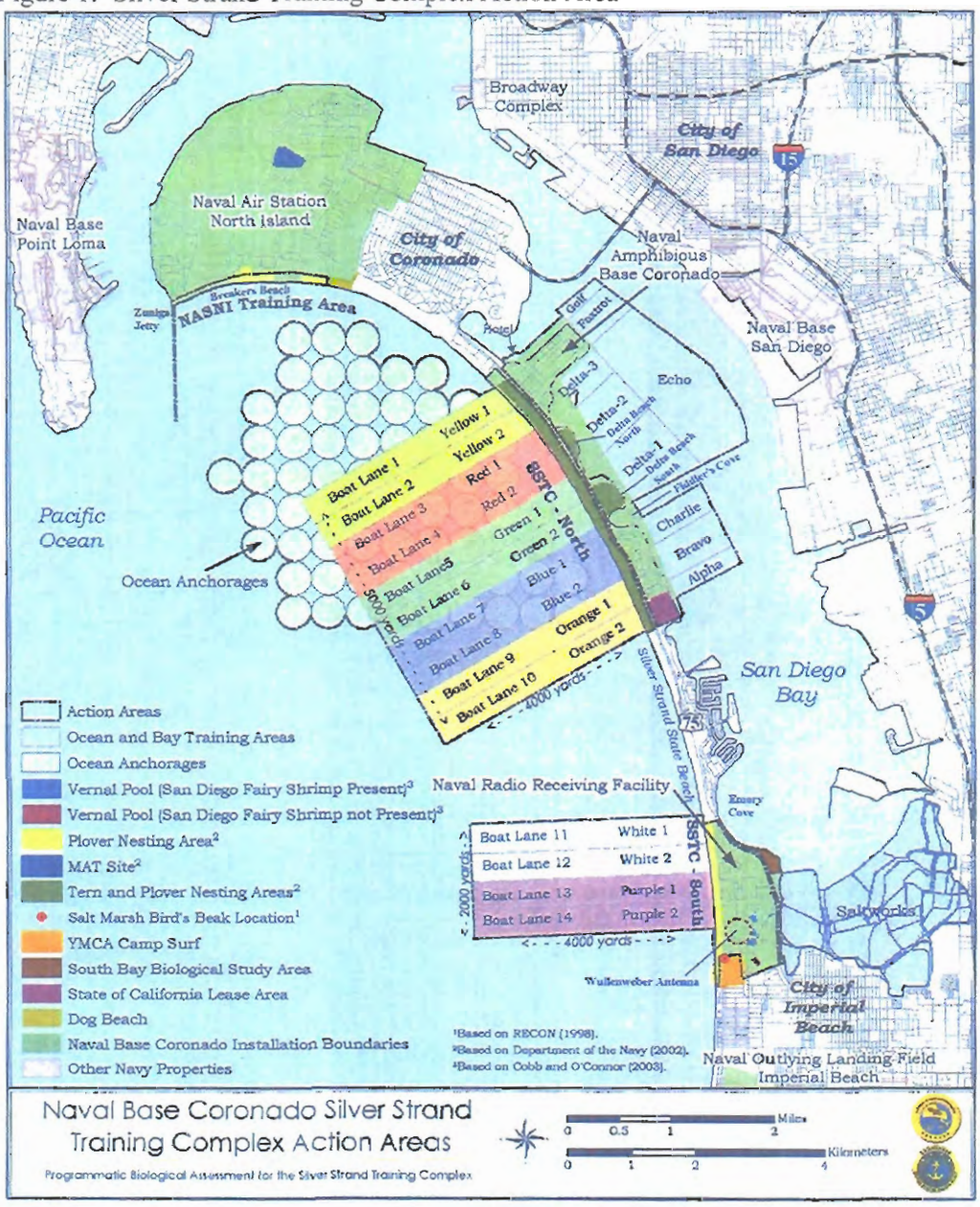


Figure 1-3: Silver Strand Training Complex – South Training Areas

EXHIBIT NO. 1c
APPLICATION NO.
CD-033-10

Figure 1: Silver Strand Training Complex Action Area



A complete description of the Navy's proposed action is provided in the BA.

EXHIBIT NO. 1d
APPLICATION NO.
CD-033-10

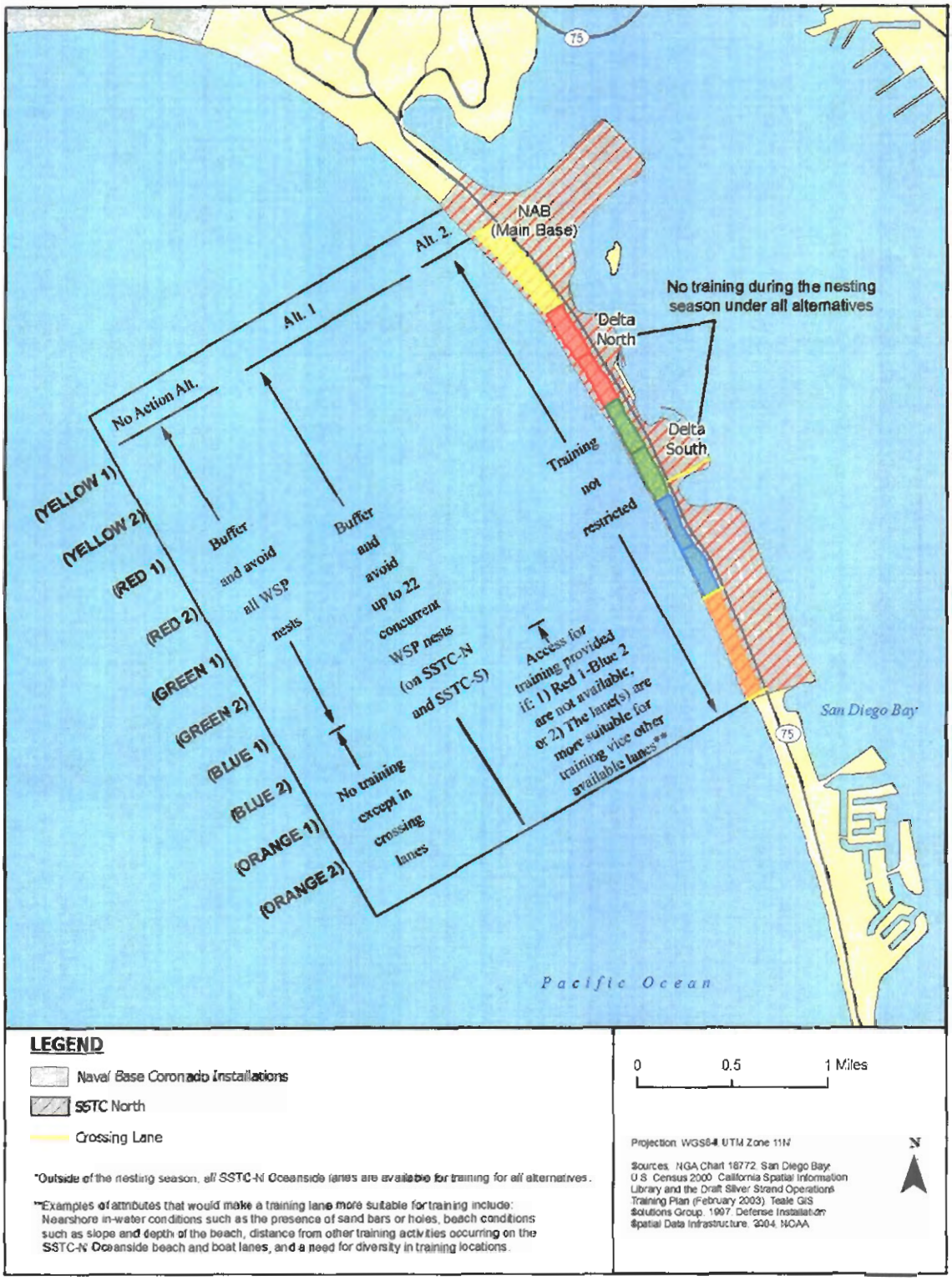


Figure 2-1: Proposed Increase in SSTC-N Beach Access and Availability for All Alternatives

EXHIBIT NO. 1e
APPLICATION NO.
CD-033-10

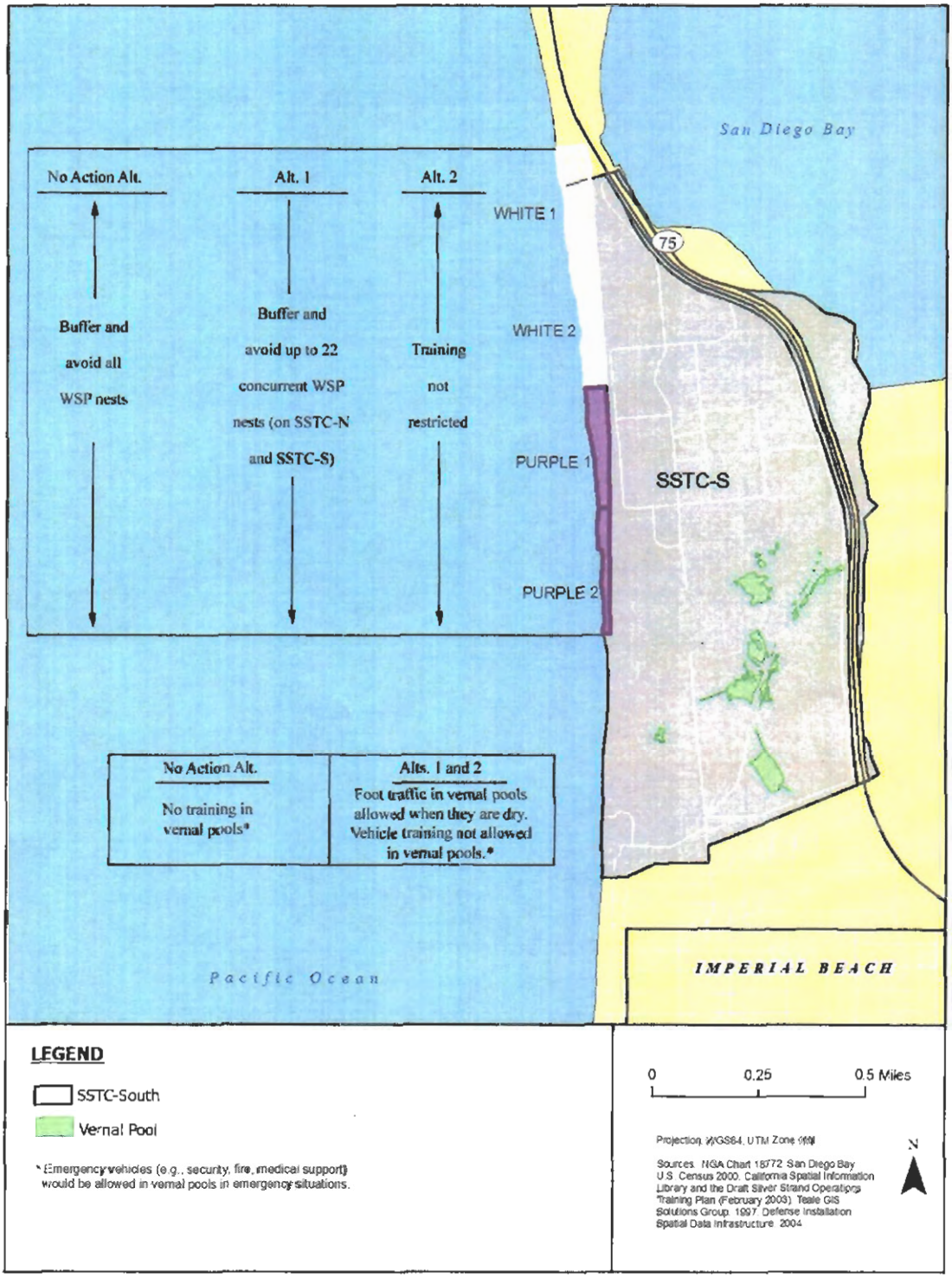


Figure 2-2: Proposed Increase in SSTC-S Beach and Inland Area Access and Availability for All Alternatives

*"Baseline" training levels identified in the table may exceed the actual baseline of training activity in any given year. The training identified as baseline represents, in most instances the maximum frequency for each activity that has occurred between 2001 and 2007.
**For analysis purposes, the Navy categorized activities into 4 groups and assigned each a number, as discussed in the "Effects of the Action" section.

Figure 1.a. Route of helicopter travel over San Diego Bay Compared to the Boundary of the South San Diego Bay Unit of San Diego Bay NWR.

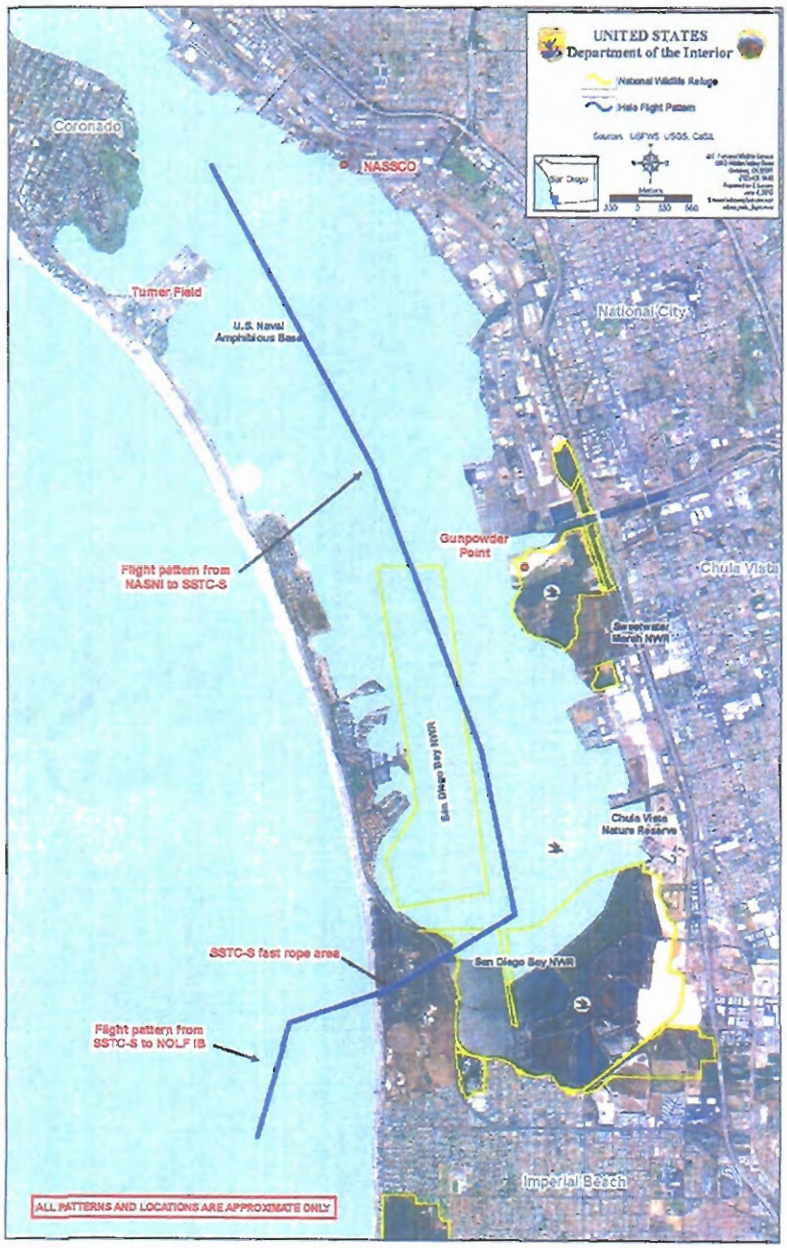


*Figure based on Latas 2010, and Service 2008e

EXHIBIT NO. 2
APPLICATION NO.
CD-033-10

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

Table 1-2: Silver Strand Training Complex – Activities by NTA

#	Activity	Description	Location	Activity Duration (days)	Activities per Year	
					Baseline	Proposed Action
NTA 1.1.2 Conduct Maneuver-Move Forces						
1	Anchoring	Surface ship or small craft crew develop proficiency in precision anchoring at designated anchorage.	All SSTC-N Boat Lanes 1-10, Breakers Beach	1	72	72
2	Towing	Surface ship or small craft crew develop proficiency in towing and being towed.	SSTC-N Boat Lanes 1-10	1	30	30
3	Moor to Buoy	Surface ship or small craft crew develop proficiency in mooring to a buoy.	SSTC-N Boat Lanes 1-10	1	36	36
NTA 1.3.1 Perform Mine Countermeasures (MCM)						
4	Parachuting	Personnel parachute from aircraft over water or land drop zones. Flares or smoke grenades may be used to signal personnel.	All SSTC Boat Lanes 1-14, SSTC-S Inland, Echo	1	216	228
5	MCM	Activities are performed from a small craft to locate and identify suspected ordnance either at mid-column or on the sea floor at a water depth of ≤ 72 feet (ft). A detachment dives to locate the suspected ordnance. Once located, a single explosive charge (10-20 pounds [lb] net explosive weight [NEW]) is placed next to the ordnance to neutralize it. The neutralized mine is then raised, towed to shore, and beached.	All SSTC Boat and Beach Lanes 1-14	1	32	58
6	Floating Mine	Personnel are inserted into the ocean via helicopter or 24-ft vessel, swim to the floating mine in water depths of less than 72 ft, and place a single explosive countercharge (less than five lb NEW) on the mine. The team retreats a safe distance prior to command detonation of a single countercharge.	All SSTC Boat Lanes 1-14	1	25	53

Table 1-2: Silver Strand Training Complex – Activities by NTA (continued)

#	Activity	Description	Location	Activity Duration (days)	Activities per Year	
					Baseline	Proposed Action
7	Dive Platoon	Divers are inserted into the ocean via helicopter or 24-ft vessel, dive to depths of 30-72 ft, and detonate sequential charges on an inert mine shape placed on the bottom with 3.5 lb NEW.	All SSTC Boat Lanes 1-14	1	8	8
8	Very Shallow Water (VSW) Operator Course	Personnel gain proficiency in the use of new equipment during diving activities. One to two RHIBs transport personnel to the site to conduct the training course.	All SSTC Boat Lanes 1-14	8	4	6
9	VSW MCM	Locating, identifying, and neutralizing mines (placing explosives on mines for the purpose of destroying them) placed either mid-column or on the sea floor at a water depth of ≤ 24 ft (10-20 lb NEW). Personnel are transported to a location in one to two RHIBs and place transponders into the water. The transponders hover over the bottom to provide divers with shallow-water navigation instruction.	All SSTC Boat Lanes 1-14, Alpha, Bravo, Charlie, Echo	1	120	156
10	Autonomous Underwater Vehicle (AUV)/ Unmanned Underwater Vehicle (UUV)	Training on use of AUVs and UUVs. One to two RHIBs are used to transport personnel to a site. Two transponders are placed in the water, with an AUV between them. AUVs and UUVs explore the area, photograph, and collect hydrographic information. After analysis is complete, appropriate Navy marine mammals are dispatched to localize and mark potential objects, followed by divers who clear the area of identified hazards. Approximately 3 percent of activities involve placing a 10- to15-lb NEW in water depths from 10 to 72 ft on the oceanside, on the bottom or up to 20 ft from the surface, to neutralize the simulated mine.	All SSTC Boat Lanes 1-14, Breakers Beach, Delta I, II, and Delta North	1	120	156

Table 1-2: Silver Strand Training Complex – Activities by NTA (continued)

#	Activity	Description	Location	Activity Duration (days)	Activities per Year	
					Baseline	Proposed Action
11	MK8 Marine Mammal/Marine Mammal Systems (MMS)	Self-Contained Underwater Breathing Apparatus (SCUBA)-assisted personnel and Navy marine mammals work together to detect specified underwater objects. Personnel work with the help of marine mammals to detect underwater objects. Approximately 10 percent of training involves the setting of a 13- or 29-lb NEW charge to detonate the objects. Sequential detonations operate at water depths of 10 to 72 ft, and are bottom laid. Single charges are laid within water depths of 24 to 72 ft, 20 ft from the surface or below.	All SSTC Boat Lanes 1-14, Breakers Beach	1	175	208
12	Mine Neutralization	Personnel are inserted via helicopter or vessel for underwater demolition training. Training consists of placing eight sequential 3.5-lb NEW explosive charges on various inert mine shapes in water depths of 30 to 72 ft to maintain qualifications.	All SSTC Boat Lanes 1-14	1	4	4
N1	Shock Wave Action Generator (SWAG)	SWAG is a tool used by EOD to disarm enemy limpet mines attached to a ship's hull. The SWAG is composed of a cylindrical steel tube, three inches long and one inch wide, containing approximately 15 grams (0.033 lb) NEW of explosives. The single explosive charge is highly focused and is equal to two diver recall devices. For SWAG training, a metal sheet containing an inert limpet mine is lowered from the side of a small vessel, such as a Landing Craft Mechanized (LCM) or Combat Rubber Raiding Craft (CRRC). Divers place a single SWAG on the mine that is located mid-water column, within water depths of 10-20 ft. A bag is placed over the mine to catch falling debris.	All SSTC oceanside Boat Lanes 1-14, Echo	1	-	90

Table 1-2: Silver Strand Training Complex – Activities by NTA (continued)

#	Activity	Description	Location	Activity Duration (days)	Activities per Year	
					Baseline	Proposed Action
N2	Surf Zone Test Detachment/ Equipment Test and Evaluation	To support clearance capability in the surf zone (out to 10 ft of water), EOD would test and evaluate the effectiveness of new detection and neutralization equipment designated for surf conditions.	All SSTC Boat and Beach Lanes 1-14, Echo	1	-	200
N3	UUV Neutralization	Training consists of placing two sequential charges consisting of a Seafox (3.3 lb NEW) or Archerfish (3.57 lb NEW) charge placed from depths of 10 ft to the bottom in water depths less than 72 ft.	All SSTC Boat and Beach Lanes 1-14	1	-	4
N4	AN/AQS-20 Mine Hunting	The training would involve an MH-60S helicopter deploying the AN/AQS-20 active high resolution, side-looking, multibeam high-frequency sonar system into the water to hunt for simulated (inert) mines along the ocean floor.	All SSTC Boat Lanes 1-14, in water depths greater than 40 ft.	1	-	200
N5	AN/AES-1 Airborne Laser Mine Detection System	The training would involve an MH-60S helicopter using a helicopter-mounted Light Detection and Ranging blue-green laser technology to detect, classify, and localize floating and near-surface moored mines in shallow water. Mines used in training are inert.	All SSTC Boat Lanes 1-14, in water depths greater than 40 ft.	1	-	48
N6	AN/ALQ-220 Organic Airborne Surface Influence Sweep (OASIS)	The training would involve an MH-60S helicopter towing the OASIS device that emulates magnetic and acoustic signatures of the ships in the water.	All SSTC Boat Lanes 1-14, in water depths greater than 40 ft.	1	-	100
N7	Airborne Mine Neutralization System (AMNS)	The training would involve an MH-60S helicopter deploying an AMNS underwater vehicle that searches for, locates, and destroys mines. The vehicle is self-propelled and unmanned. Approximately 20 percent of the training would involve the AMNS being remotely detonated (3.5-lb NEW) when it encounters a simulated (inert) mine shape.	All SSTC Boat Lanes 1-14, in water depths greater than 40 ft.	1	-	48
NTA 1.4.6 Conduct Maritime Interdiction						
13	Visit, Board, Search, and Seizure	Activity involves multi-national training consisting of interception, hailing, and armed boarding and search of a vessel underway or at anchor from another vessel.	SSTC-N Boat Lanes 1-10 Naval Base San Diego	1	30	42

Table 1-2: Silver Strand Training Complex – Activities by NTA (continued)

#	Activity	Description	Location	Activity Duration (days)	Activities per Year	
					Baseline	Proposed Action
NTA 1.5.4 Conduct Amphibious Operations						
14	Small Boat Handling	Consists of maneuvering a CRRC in a confined space. Consists of students conducting various approaches to a pier.	Foxtrot	1	94	94
15	Swimmer Conditioning – Bay and Ocean with fins	Involves timed San Diego Bay and ocean swims with fins in a variety of conditions where groups of students participate in training. Swim course prepares students with progressive difficulty and varied conditioning swims.	SSTC-N Boat Lanes 1-10, Foxtrot	1	189	189
16	Basic Reconnaissance Course Final Mission	Insertion of personnel in small groups offshore by dropping personnel and small inflatable boats via helicopter (helocasting). Each group proceeds to shore in the boats, beaches their boats, and proceeds inland. Training scenarios may include shore observation prior to landing, and clandestine movements from the surf to inshore locations.	All SSTC-S Boat and Beach Lanes 11-14, SSTC-S Inland, Waters outside Boat Lanes	1	8	8
17	Obstacle Course	Personnel navigate the obstacle course that is established on the Yellow 2 Beach on SSTC-N. The obstacle course is often combined with a run on the SSTC-N oceanside beaches.	SSTC-N Beach, Lane-Yellow 2	1	138	142
18	Hydrographic Reconnaissance	Students swim and survey underwater terrain conditions from small watercraft or near-shore insertion on reconnaissance missions to find underwater obstacles and identify conditions for a beaching party. The training may also include the clearing of obstacles. Swimmers use weights and soundings to measure depth and the activity occasionally includes foot patrols on the beach.	All SSTC Boat Lanes 1-14, Breakers Beach Delta III	1	40	44
19	Surf Observations (SUROBS)	Groups of students clandestinely patrol to a predetermined position on the beach to observe, monitor, and analyze the various surf rhythms and conditions.	All SSTC Beach Lanes 1-14	1	116	116

Table 1-2: Silver Strand Training Complex – Activities by NTA (continued)

#	Activity	Description	Location	Activity Duration (days)	Activities per Year	
					Baseline	Proposed Action
20	CRRC IBS/Surf Passage/ Boat Team Organization and Function	Groups of students show their competence in navigation of CRRCs and inflatable boat small from the beach out through the surf zone to a predetermined point, simulate evacuation and recovery, flip and right, and return to shore through the surf. Boat teams may launch from an amphibious ship up to 50 miles offshore. This is designed to develop offshore, over-the-horizon navigation skills. Students may also perform conditioned swims.	SSTC-N Boat Lanes 1-10, Breakers Beach, Foxtrot	1	72	72
21	CRRC Towing and High Speed Maneuver	Preparation of CRRCs for towing by another craft and also towing another craft. Students in boats maneuver vessels at high speeds in formations with other boats.	Echo, Foxtrot, Golf	1	8	8
22	CRRC/LCU Launch and Recover Bay and Ocean	Students launch CRRCs from a Landing Craft Utility (LCU) into the water from the SSTC-N piers or SSTC beach. The CRRCs are then recovered by personnel.	All SSTC Boat and Beach Lanes 1-14, Delta I, II, Echo	1	24	24
23	CRRC Navigation, Bay and Ocean Runs	Demonstration of competence in piloting and navigation of CRRCs in the San Diego Bay and ocean.	All SSTC Boat and Beach Lanes 1-14, Echo, Foxtrot, Golf	1	26	26
24	Amphibious Raid Course Final Mission	A maximum of 110-130 students train simultaneously. Students embark from the SSTC-N piers and transit to NASNI via landing craft that launch inflatable boats that proceed to the NASNI beaches.	Breakers Beach, Echo, Foxtrot, Golf, NASNI, San Diego Bay waters around NASNI	1	24	24
25	Amphibious Raid	May include insertion of up to 150 personnel in various mission scenarios. Personnel may be inserted onto shore via helicopter hovering or landing; Amphibious Assault Vehicles; or CRRCs launched from an amphibious ship offshore, and landing craft. When on shore, personnel activities may include reconnaissance for intelligence gathering, preparation for dive activities, manual and machine excavations, and use of small arms (blanks) and pyrotechnics.	SSTC-S Boat Lanes 11-14, SSTC-S Inland	3	2	18

Table 1-2: Silver Strand Training Complex – Activities by NTA (continued)

#	Activity	Description	Location	Activity Duration (days)	Activities per Year	
					Baseline	Proposed Action
26	Direct Action	Similar to Amphibious Raid, includes insertion of up to 90 personnel onto the shore via helicopter, CRRCs, or light wheeled vehicles. Reconnaissance, dive activities, small arms (blanks), pyrotechnics, simulated munitions, boat breaching, snipers (w/bullet traps), and beach patrols are all part of the complete activity. Personnel may proceed inland and perform live fire inside the bunkers and breaching outside the bunkers.	SSTC-S Boat Lanes 11-14, SSTC-S Inland	3	2	18
27	Craft Landing Zone (CLZ)	CLZ Team surveys and marks beach for one Landing Craft, Air Cushion (LCAC) ingress/egress. Provides personnel to safely guide LCAC to designated shore landing area.	All SSTC Boat and Beach Lanes 1-14, Breakers Beach	1	4	4
N8	Tactical Recovery of Aircraft and Personnel (TRAP)	To simulate the rescue of a downed helicopter and its crew through an amphibious raid, usually at nighttime, TRAP consists of the insertion of up to 75 personnel ashore via four to six helicopters hovering and landing. Activities include foot movement ashore, manual excavations, light-wheeled vehicles, and use of small arms (blanks) and pyrotechnics to simulate attacks.	All SSTC-S Beach Lanes 11-14, SSTC-S Inland	1	-	4
NTA 1.5.6 Conduct NSW						
28	Swimmer/CRRC Over-the-Beach (OTB) Insertions/ Extraction with Pyrotechnics/ Blanks	Raiding parties launch approximately 1,000 yards (yd) off beaches, allowing for swimmers to swim ahead and scout the beach and then allow CRRCs to proceed to the beach. May include patrols on the beach and inland, burying CRRCs in vegetation to conceal them, and use of small arms, blanks, and pyrotechnics to simulate attacks.	All SSTC Boat and Beach Lanes 1-14, SSTC-Inland	4	52	86
29	OTB Stalk	Personnel swim to the beach from CRRCs that are helo-cast into the water. SEAL team personnel then clandestinely move up the beach to scout an area.	All SSTC-S Boat and Beach Lanes 11-14, SSTC-Inland	1	16	24

Table 1-2: Silver Strand Training Complex – Activities by NTA (continued)

#	Activity	Description	Location	Activity Duration (days)	Activities per Year	
					Baseline	Proposed Action
30	Immediate Action Drills	Personnel swim to the beach from CRRCs that are helo-cast into the water. Mock enemies fire blank ammunition and use pyrotechnics; the raiding party takes evasive action in response.	All SSTC-S Boat and Beach Lanes 11-14, SSTC-S Inland	1	8	12
31	Breacher Training	Training designed to provide experience knocking down doors to breach a building or structure. Breacher training provides training for entering a building or structure using manual, compressed gas, torch, or shotgun. Conducted at SSTC-S inside the fence line, frequently temporary doors and frames are constructed to simulate exterior and interior door breaching.	SSTC-S Inland (Bunker 98, Northwest and east of Bunker 99, Bunker 99)	1-5	9	20
32	Amphibious Warfare	Comprehensive training that includes insertion onto and extraction from the beach, noncombatant evacuation, and hydrographic reconnaissance.	SSTC-N Boat and Beach Lanes 1-8, SSTC-S Boat and Beach Lanes 11-14 Bravo, Delta I, II, III, Echo, Fox, Golf, Hotel	1	50	84
33	Mobility Primary Mission Area	Personnel are inserted onto the beach via RHIBs or Mark V Special Operations Craft. Provides hands on training on gear set up configurations, on reconnaissance of the beach, and on developing an observation base.	SSTC-N Boat and Beach Lanes 1-8, SSTC-S Boat and Beach Lanes 11-14 Bravo, Delta I, II, III, Echo, Fox, Golf, Hotel	1	200	200
34	Escape and Evasion	This activity is designed to enhance boat operators' skills in escape and evasion techniques. The activity consists of simulated attacks on special operations crafts. Two RHIBs and two Mark V Special Operations Craft are used for the training.	SSTC-N Boat and Beach Lanes 1-8, Bravo	1	20	84

Table 1-2: Silver Strand Training Complex – Activities by NTA (continued)

#	Activity	Description	Location	Activity Duration (days)	Activities per Year	
					Baseline	Proposed Action
N9	Underwater Demolition Qualification/ Certification	Demolition Requalifications and Training provides teams with experience in underwater detonations by conducting detonations on metal plates near the shoreline. At water depths of 10 to 72 ft, two sequential 12.5-13.75 lb NEW charges are placed on the bottom or a single 25.5-lb NEW charge is placed at a depth of 20 ft to the bottom.	All SSTC Boat and Beach Lanes 1-14	1	-	12
N10	Vehicle Patrolling and Testing	Personnel use the beach and inland areas for driving familiarization of various vehicles, and gear configuration and setup.	SSTC-N Beach, SSTC-S Beach, SSTC-S Inland	1	-	50
N11	NSW Underwater Demolition Training	Up to 40 personnel participate in the activity, which involves small groups swimming to shore from four inflatable boats located approximately 1,000 yd offshore; boats may be beached on shore. A single charge of less than 10 lb NEW (if detonated on the bottom) or less than 3.6 lb NEW (if within five ft of the surface) is manually detonated near the shoreline in water less than 24 ft deep.	All SSTC Boat and Beach Lanes 1-14	1	-	12
NTA 2.2.3 Perform Tactical Reconnaissance and Surveillance						
35	Helicopter Rope Suspension Training/Cast & Recovery	Insertion and extraction of ground-force personnel (primarily reconnaissance teams) by helicopter into or from rough terrain or urban areas. Cast and recovery of inflatable boats and personnel into the water, rappelling and fastroping over land and water. Some activities require personnel to swim to shore from the drop site and others extract the personnel from the site.	All SSTC Boat and Beach Lanes 1-14, SSTC-S Inland Alpha, Bravo, Charlie, Delta I, II, III, Echo, Hotel, Foxtrot	1	124	154
36	Rappel & Fast Rope Training	Rappelling from the rappel tower north of the obstacle course located on Yellow Beach.	SSTC-N Beach Lane 1-Yellow	1	6	11

Table 1-2: Silver Strand Training Complex – Activities by NTA (continued)

#	Activity	Description	Location	Activity Duration (days)	Activities per Year	
					Baseline	Proposed Action
37	SEAL Delivery Vehicle/Advanced SEAL Delivery System Certification to Deploy	Designed to certify SDV Team operators for deployment, activities include Direct Action, reconnaissance, and counter-terrorism. Training may include navigation runs into and out of San Diego Bay, hydrographic reconnaissance, OTB training, combat swimmer, and underwater detonation training (a single timed charge of 10 lb or less NEW in water depths of 24 ft or less placed from mid-water column to the seafloor), that may be conducted in coordination with other training activities.	All SSTC-N Boat and Beach Lanes 1-10, Delta III, Echo, Foxtrot, Golf, Hotel	14	14	40
NTA 4.5.6 Construct, Maintain, and Operate Logistics Over-the-Shore						
38	Offshore Petroleum Discharge System (OPDS)	Consists of five training subcomponents including the Beach Termination Unit (BTU), Operation Utility Boat (OUB) Technicians, OUB Coxswain, Dive Boat Operation Technician, and Single Anchor Leg Moor (SALM) Training. This activity trains personnel in the transfer of petroleum (though only sea water is used during training) from ship to shore. From approximately one miles offshore, the OUB technicians and underwater construction team divers roll out conduit from a ship, deploy the SALM mooring which sinks and settles to the ocean floor, and use anchors at various points along the conduit to secure it to the seafloor. The conduit terminates at the shore location of the BTU manifold.	All SSTC-N Boat and Beach Lanes 1-10, Bravo Waters outside of boat lanes	25	6	6
39	Amphibious Bulk Liquid Transfer System (ABLTS)	Deployment of the ABLTS. Using warping tugs to deploy a 10,000-ft-long floating liquid (seawater) transfer conduit from a commercial tanker to a Beach Interface Unit (BIU) onshore.	All SSTC-N Boat and Beach Lanes 1-10, Bravo	15	4	5

Table 1-2: Silver Strand Training Complex – Activities by NTA (continued)

#	Activity	Description	Location	Activity Duration (days)	Activities per Year	
					Baseline	Proposed Action
40	Barge Ferry Causeway/ Coxswain Training	Navigation course for the barge ferry consisting of navigation, beaching and retracting drills, and surf handling. Beaching drills include connecting causeway sections. A barge ferry generally consists of one powered causeway section connected to one or more nonpowered sections.	All SSTC-N Boat and Beach Lanes 1-10, Bravo	1-3	34	54
41	Causeway Pier Insertion and Retraction	Bulldozers dig notches in the beach to make an anchor point for the floating pier, which is beached using a barge ferry. Pier sections are added end-to-end until the causeway extends out over the surf zone. Training is conducted on both older causeway systems and on the newer, improved Navy lighterage system.	SSTC-N Boat and Beach Lanes 3-10, Bravo	2-5	9	10
42	Elevated Causeway System (ELCAS)	A temporary pier is constructed off of the beach. The pier is designed to allow for the offload of materials and equipment from supply ships. Piles are driven into the sand with an impact hammer. Causeway platforms are then hoisted and secured onto the piles with hydraulic jacks and cranes. The ELCAS pier, including associated piles, is removed at the conclusion of training.	All SSTC-N Boat and Beach Lanes 1-10, Designated Bravo Beach training lane	8-10	2	4
43	Establish Beach Party Command Post	Establishment of a command post. Training includes using bulldozers and backhoes to dig ravines and perimeter trenches and adding camouflaging netting to provide defensive security. Latrines are set up and mobile generators are brought in for power. An observation post is set up. Mock aggressors may be dispatched to simulate an attack.	All SSTC-N Boat and Beach Lanes 1-10	4	16	16
44	Sterngate Marriage to Amphibious Ship/LCU; Embark/Debark Welldeck 1	An amphibious ship is linked with an LCU. The LCU drops its bow ramp and approaches an amphibious vessel to transfer personnel, rolling stock, and supplies without embarking the vessel. LCU Embark/Debark requires the amphibious ship to lower down by releasing ballast water to embark the LCU in the welldeck or debark from the welldeck.	All SSTC-N Boat and Beach Lanes 1-10, Waters outside Boat Lanes	1	40	40

Table 1-2: Silver Strand Training Complex – Activities by NTA (continued)

#	Activity	Description	Location	Activity Duration (days)	Activities per Year	
					Baseline	Proposed Action
45	LCU/ LCM Beaching	Personnel practice navigating the surf and beaching LCUs and LCMs and rescuing beached watercraft. Bulldozers may also assist by pushing the craft off the beach.	All SSTC Boat and Beach Lanes 1-14, Designated Bravo Beach training lane	1	60	60
46	LCU/LCM Towing/Being Towed	Training with LCUs and LCMs allow pilots to practice rescuing beached water craft via towing. Bulldozers may also assist by pushing craft off the beach.	All SSTC-N Boat and Beach Lanes 1-10, Designated Bravo Beach training lane	1	60	60
47	Communications Training	Personnel train in setting up a radio and practicing communications procedures.	All SSTC-N Beach Lanes 1-10, SSTC-S Inland Bravo, Delta I, II, III	2	1	2
48	Field Training with a Beach Camp	Provides training in the establishment and disestablishment of a self-sustaining camp of up to 850 personnel. The camp includes erection of tents (operational galley, field mess, shower units, and berthing), generators and boiling units, light panels, refrigeration units, laundry units, and water purification units. Mock aggressors may also be used to attack the campsite.	All SSTC Beach Lanes 1-14, SSTC-S Inland	14	1	2
49	Maritime Prepositioning Ships (MPS) Offload	Materials and supplies are offloaded from an amphibious ship offshore onto a Roll-on/Roll-off Discharge Facility (RRDF), a causeway platform.	All SSTC Boat and Beach Lanes 1-14, SSTC-S Inland	5	1	2
50	Reverse Osmosis Water Purification Unit (ROWPU)	ROWPU is set up on the beach and extracts seawater and converts it into potable water via reverse osmosis and chlorination. The unit includes a generator with berms constructed around it to provide support.	All SSTC Beach Lanes 1-14, SSTC-S Inland	4	4	4
51	Roll-on/Roll-off Discharge Facility (RRDF)	Causeway platforms are set up off the beach and supplies are transferred from a ship to the beach. The causeway sections are inserted onto the beach by ferry barges, which are piloted by personnel performing concurrent training.	All SSTC-N Boat and Beach Lanes 1-10, Foxtrot	5	1	2

Table 1-2: Silver Strand Training Complex – Activities by NTA (continued)

#	Activity	Description	Location	Activity Duration (days)	Activities per Year	
					Baseline	Proposed Action
52	Maritime Prepositioned Force Utility Boat (MPFUB) Operator Course	MPFUB Operator Course includes pier approaches, surf salvage, beaching and retracting on the oceanside, offshore maneuvering, towing, and offshore navigating.	All SSTC-N Boat and Beach Lanes 1-10, Designated Bravo Beach Training Lane, Delta I, II, III	9	2	2
53	Lighter, Amphibious, Resupply, Cargo 5-ton (LARC V) Operator Training	Training with LARC Vs allows pilots to practice start-up and shut-down procedures, maintenance, towing, anchoring, maneuvering on land and at sea, and surf negotiation.	SSTC-N Boat and Beach Lanes 1, 2, 5-8, Delta I, II, III	6	1	1
NTA 4.9.1 Conduct Mission Area Training						
	NSW Diving and Beach Operations					
54	Lung Automatic Rebreather (LAR) V Closed Circuit Breathing Diving	Training on use of the LAR V, which recirculates exhaust air. This allows the diver to stay submerged and remain undetected.	Alpha, Bravo, Charlie, Delta III, Echo, Fox, Golf, Hotel, Glorietta Bay, San Diego Bay, Naval Base San Diego	1	126	126
55	Open Circuit Breathing Diving	Personnel train on the use of SCUBA in the most varied underwater terrain.	All SSTC Boat and Beach Lanes 1-14, Breakers Beach, Alpha – Hotel	1	12	12
56	OTB Field Training	Personnel paddle to the beach undetected while an advance swimmer swims ahead to observe for enemy movement and signal the landing party to come ashore. The team patrols and remains prepared for unexpected situations. Afterwards, they discretely reenter the water and paddle back offshore. Held over a 5-day or night period.	All SSTC Boat and Beach Lanes 1-14, Delta I, Echo Breakers Beach	5	36	36
57	Rock Portage	Students gain proficiency in navigating around and portaging over a rock jetty. Following the small surf passage, multiple teams must carry their raft over the rock jetty formations for a realistic training experience.	All SSTC Boat and Beach Lanes 1-14, Breakers Beach and Zuniga Jetty, Coronado Rock Jetty	4	18	20

Table 1-2: Silver Strand Training Complex – Activities by NTA (continued)

#	Activity	Description	Location	Activity Duration (days)	Activities per Year	
					Baseline	Proposed Action
	NSW Land Warfare					
58	Land Patrolling	Students patrol the beach in a single file line and communicate with each other nonverbally through hand signals and gestures. Inert weapons are carried to simulate combat realism.	All SSTC Beach Lanes 1-14, SSTC Inland, Alpha	1	18	18
59	Immediate Action Drills	Small groups of trainees are required to react to various situations such as reconnaissance, or by initiating offensive and defensive measures to perceived threats during land patrolling. Personnel may use blanks, simulated munitions, and pyrotechnics to initiate action.	All SSTC Beach Lanes 1-14, SSTC Inland	1	5	6
	NSW Advanced Training					
60	OTB Insertion/Photo Reconnaissance	Personnel swim to shore, breach the perimeter beach fence, and perform photo reconnaissance on the interior of SSTC-S.	All SSTC-S Boat and Beach Lanes 11-14, SSTC Inland, Beaches outside SSTC-S fence line	1	31	31
61	Photo Image Capture	Photographing, downloading, and sending photographic images to command centers.	SSTC-S Inland	14	3	4
62	Field Skills (Observation Drills, Sketching, Range Estimation)	Timed drills in observing, sketching, and estimating range to targets.	SSTC-S Inland	1	22	24
63	Stalking, Movement, Hide-Sites	Training provides teams with the skills to clandestinely patrol an inland area and assess risks from potential enemy forces. Team members learn to camouflage themselves and move through an area undetected.	SSTC-N Boat Lanes-Red 1 and 2, SSTC-S Beach Lanes-White and Purple 1 and 2, SSTC Inland	5	8	8

Table 1-2: Silver Strand Training Complex – Activities by NTA (continued)

#	Activity	Description	Location	Activity Duration (days)	Activities per Year	
					Baseline	Proposed Action
64	Close Quarter Combat/Close Quarter Defense	Training in clearing a building or structure of enemy personnel. Personnel and occasionally military trained dogs (inserted via helicopter, CRRCs, or light-wheeled vehicles) move on the periphery, breach through doors, and move through the internal sections of a building or structure, locating and extracting individuals and securing the area for a larger team.	All SSTC-S Boat and Beach Lanes 11-14, SSTC-S Inland	1	109	198
65	Communications	Classroom instruction and a practical test, evaluation, and movement.	SSTC-S Inland	5	6	6
66	Unmanned Aircraft System (UAS) Training	Low-level take off and landing practice and training for UASs used for observation and enhanced reconnaissance.	SSTC-S Inland	5	12	12
67	Around the World	Students paddle in CRRCs from Beach Lane Yellow-1, around NASNI, to bayside SSTC, cross over to the oceanside through tunnel at Silver Strand State Beach (SSSB), and portage or paddle back to Yellow-1 during a timed interval.	All SSTC-N Boat and Beach Lanes 1-10, Alpha, Bravo, Charlie, Delta I, II, III, Echo, Foxtrot NASNI, Breakers Beach	1	6	6
NTA 4.9.4 Provide/Execute Training for U.S. and Other Nation Units and Individuals						
	NSW Physical Fitness Training					
68	Physical Training Runs	As an essential part of training, Basic Underwater Demolition / SEAL (BUD/S) running groups averaging 30-150 personnel run a variety of distances on the beach generally ranging from four to six mi. Trainees may occasionally have a military working dog participating in the physical conditioning. Timed runs also are conducted for 4- and 14-mile distances that extend outside of SSTC.	All SSTC Beach Lanes 1-14, SSSB	1	464	464
69	Physical Readiness Training	Training with timed runs along the beach, open-water swims, push-ups, and sit-ups make up near-daily physical fitness conditioning and can include organized runs of students or staff personnel of up to 100 personnel.	All SSTC-N Boat and Beach Lanes 1-10, SSTC Inland, Delta III, Foxtrot	1	280	280

Table 1-2: Silver Strand Training Complex – Activities by NTA (continued)

#	Activity	Description	Location	Activity Duration (days)	Activities per Year	
					Baseline	Proposed Action
70	Swim Training	Ocean swims in a variety of temperatures and surf conditions. Students also swim in groups for 2-, 3.5-, and 5.5-mile swims. The location of the swim depends on the ocean conditions.	All SSTC-N Boat and Beach Lanes 1-10, Alpha, Bravo, Charlie, Delta I, II, III, Waters off of SSSB and Coronado City Beach	1	170	172
71	Hell Week	Consists of a period of nonstop training revolving around learned activities: surf passage in inflatable boats, rock portage, "around the world" paddling, hydrographic reconnaissance, running, swimming, and use of the obstacle course. The existing SSTC-N demolition pit may be filled with water and used for temperature conditioning.	All SSTC Boat and Beach Lanes 1-14, Alpha-Hotel, SSTC-S Inland, NASNI Breakers Beach Waters around NASNI, SSSB, Coronado City Beach	5	6	6
72	Rucksack March	While carrying a 65-75 pound pack, students hike 5 to 14 miles within specified time limits.	All SSTC Beach Lanes 1-14, SSTC-S Inland, Coronado beach, SSSB	1	54	54
73	Monster Mash	Course consisting of a minimum 10-mile run, 2-mile swim, 3-mile boat paddle, and rock portage.	All SSTC Boat and Beach Lanes 1-14, SSTC-S Inland Coronado beach SSSB	1	6	6
NTA 4.12.6 Provide Industrial and Environmental Health Services						
74	Conduct Environmental Health Site Assessment	Usually conducted as part of another operation and typically consists of establishing a small camp and interacting with other units to provide preventative medicine to field personnel. Part of their training may include learning to collect and analyze air and soil samples in areas where operations occur.	SSTC-S Beach Lanes - Purple 1 and 2, SSTC-S Inland	3	3	3

Table 1-2: Silver Strand Training Complex – Activities by NTA (continued)

#	Activity	Description	Location	Activity Duration (days)	Activities per Year	
					Baseline	Proposed Action
NTA 6.1.1 Protect Against Combat Area Hazards						
75	Conventional Ordnance/ Improvised Explosive Device (IED) Response	On-foot search for exposed and buried inert (nonexplosive) unexploded ordnance (UXO) and IEDs. Metal detectors and hand tools are used to discover and excavate buried UXOs. After UXOs and IEDs have been properly identified, a detachment simulates neutralization of threats using render-safe procedures and simulated detonation in place.	All SSTC Beach Lanes 1-14	1	64	120
76	Land Mine Detection/ Neutralization	On-foot search for inert (non-explosive) land mines buried in the sand. Once probing techniques using hand tools and metal detection uncover buried land mines, a detachment group simulates neutralization of the mines using simulated explosives.	All SSTC Beach Lanes 1-14	1	24	45
NTA 6.3.1 Force Protection: Protect and Secure Area of Operations						
77	Field Training Exercise (e.g., SEAHAWK)	Provides training in conducting port and coastal waterborne force protection, harbor defense, and seaward security. Manning can vary from 50 to 500 personnel depending on scope and participation. Armed patrol boats conduct simulated patrol missions in the San Diego Bay. Campsites are established, including erection of tents (communication gear, conference room, operations center, operational galley, field mess, and 14-person berthing) and generators.	SSTC-S Inland Delta I, II, III, Echo, and Foxtrot San Diego Bay	1-14	53	53
NTA 6.3.3 Combat Terrorism						
78	Small Boat Attack	A small boat performs an attack in the form of runs on an anchored ship.	SSTC-N Boat Lanes 1-10, Breakers Beach	1	30	36

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

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

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

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

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

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

1.6.5.13 Long-term Site Enhancement Plan

- Develop a site enhancement plan that would include establishing dunes on the windward (west) edges of Delta North and South that would enhance this area for plovers, creating a source of sand for the least tern nesting area, and establishing a better visual barrier between SR-75 and the nesting colony. This plan could be developed as a part of the NBC Integrated Natural Resources Management Plan revision.

1.6.5.14 Vehicle Patrolling and LARC V Operator Training

- Vehicle patrolling and LARC V Operator training would not occur in Red, Blue, or Orange Beach Lanes during the nesting season.

1.7 ALTERNATIVES ELIMINATED FROM FURTHER CONSIDERATION

CDs do not typically require a discussion of the consideration of alternatives to the Proposed Action. The Navy, however, has received the California Coastal Commission's (CCC) comments on the SSTC Draft EIS and felt that inclusion of a discussion of alternatives would help the CCC in its review of the CD, and address several questions the CCC has on the Proposed Action. Therefore, a discussion of alternatives is provided below.

1.7.1 Alternate Training Complex Locations

Historically, SSTC continues to be a critical training range for the west coast naval amphibious and special warfare activities. SSTC derives its unique value and high utility for training of naval forces from its unique environment and terrain, as well as its proximity to the homeport of San Diego, other training ranges in the southwest, and military families. Local installations host naval organizations that provide military command oversight, facilities management, vessel and aircraft maintenance, depots to supply materials, and research and development services. The proximity of SSTC to equipment, personnel, facilities, and organizational services that are necessary for training at SSTC is vital to the efficient execution of Navy training. Training ranges outside of the San Diego area do not provide co-location of commands, equipment, facilities, or infrastructure, which are provided on NAB Coronado, necessary to support existing and future training to meet training and personnel tempo requirements. SSTC is critical to Navy training programs due to its unique combination of attributes that cannot be duplicated. These unique attributes and training resources are described in detail in Section 1.3.

Other military training areas located within the San Diego area, such as the Marine Corps Base Camp Pendleton, San Clemente Island, and Remote Training Site Warner Springs, do not meet the criterion necessary for amphibious and special warfare training for many reasons, including their lack of calm waters and steeper offshore bottom terrain. Further, these other training areas already sustain their own training activity schedules and priorities; thus, they would be unable to meet the tempo requirements necessary for Fleet deployment schedules.

Because of the CCC's comment on the SSTC Draft EIS to move operations to Camp Pendleton, additional clarifying detail is provided on why Camp Pendleton was found not to be an appropriate location for relocation of training because:

- Most training involves a large number of personnel, slow-moving barge-type vessels, inflatable vessels, and/or heavy equipment, all of which are stationed and maintained in housing/command facilities, piers, and yards on NAB Coronado. None of these could be quickly moved on a daily

basis back and forth from NAB Coronado to Camp Pendleton. Most basic training schedules already take the full working day without logistical preparation and transport time. Training activities are integrated with other types of activities in the same day using necessary facilities, personnel, and command infrastructure on NAB Coronado. Additional transport time back and forth from NAB Coronado and Camp Pendleton would hinder the commands' abilities to meet both tight deployment schedules and personnel tempo requirements.

- The training environment at Camp Pendleton is not appropriate for most types of training that is conducted at SSTC. For example, the underwater terrain has a much steeper gradient as it approaches the beach at Camp Pendleton. The deeper water is a safety hazard for new personnel who are learning basic skills crossing the hazardous and challenging surf conditions. Camp Pendleton is a more appropriate environment for integrated training exercises where personnel are more experienced in handling the rough surf conditions.
- Camp Pendleton does not offer 3.9 nm of coastline necessary for relocation of Navy training. Most of Camp Pendleton's coastline is characterized by sensitive natural resources, some similar to those at SSTC, which makes those areas unavailable for Navy training. Camp Pendleton's remaining available coastline is already heavily scheduled for Marine Corps training, and would not be able to sustain the additional load of SSTC training.
- Camp Pendleton does not offer calm water necessary for most types of training. New personnel need to begin learning in calmer, safer waters, and only after they have training in these areas is it possible to transition into the rougher ocean surf waters. SSTC offers large open areas of calm San Diego Bay water where multiple commands can simultaneously train safely.

For the reasons outlined above, alternate training locations have been eliminated from further consideration.

1.7.2 Training Relocation to SSTC-S

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

SSTC-S beach lanes do not have the same physical attributes as their northern counterparts. The four Boat Lanes are too shallow in depth and do not provide adequate space for many activities, resulting in restricted maneuvering areas. The surf in front of SSTC-S is also characterized by more sand bars, reducing its accessibility for landing craft, and there are no charted anchorage sites or moorings, which are required for some training activities. Training activities involving groups on foot originating out of housing and/or classrooms on SSTC-N would be infeasible because of the additional travel distance to SSTC-S, between two and six miles each way. Many training activities require facilities on SSTC-N that are not available on SSTC-S, including the extensive obstacle course, rappel tower, dining facilities, and housing facilities on SSTC-N. This alternative, therefore, does not allow for the full range of required training elements at a single location.

In addition, the time required for planning, logistics, and transport would be increased if activities were relocated to SSTC-S. Increased time would be necessary to work with training schedules, planning around lack of immediate highway access, and procuring and storing logistical transport vehicles. In addition, more logistical time is involved in transporting the equipment and transition vessels berthed on NAB Coronado bayside around NASNI to arrive at the designated training site. As a result, training times would increase and training schedule requirements for fleet deployment schedules would not be met.

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

1.7.3 Training Reductions

Reductions in training from current levels at SSTC would not support the Navy's ability to meet training requirements consistent with the FRTP. A reduction in the types, or tempo of training activities available at SSTC would mean that local units/users would have to routinely travel to other range complexes to fulfill training requirements. As outlined in Section 1.2, this is not a feasible alternative. For these reasons, this alternative has been eliminated from further consideration.

1.7.4 Simulated Training

An alternative that would rely entirely on computer-simulated training would not meet the purpose and need for the Proposed Action (Section 1.4). Although computer simulation is used to enhance combat performance, sailors and marines must be able to practice communicating, maneuvering, operating, repairing equipment, and firing weapons in as high-stress and realistic an environment as is possible, for days at a time, in order to achieve necessary levels of proficiency. Currently, the Navy (and Marine Corps) makes use of computer-simulated virtual training environments—the Navy conducts command and control activities without operational forces (constructive training) where possible. These training methods have substantial value in achieving limited training objectives. Computer technologies provide excellent tools for implementing a successful, integrated training program while reducing the risk and expense associated with military training. Virtual and constructive training, however, are an addition to, not a substitute for, live training. Unlike live training, simulated training does not provide the requisite level of training or realism necessary to attain combat readiness; and simulated training cannot replicate the high-stress environment encountered during an actual contingency situation. Therefore, this alternative was eliminated from further consideration.

1.7.5 Construction and Use of Demolition Pit at SSTC-S

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

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

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

- NP = Number of pairs needed rangewide to maintain a viable population = 5,000 pairs, as provided in most recent population viability assessment (Akcakaya et al. 2003).
- R = Ratio between nests observed statewide in a given year (8,173 nests in 2006) and the average between the estimated minimum and maximum number of breeding pairs statewide in the same year [(7,006 pairs + 7293 pairs) / 2], using 2006 data provided in the California Department of Fish and Game California Least Tern Breeding Survey (Marschalek 2007) (i.e. 8,173 nests / 7,149.5 = 1.143 nests/pair).
- NBCF = Fraction of rangewide nests maintained on NBC lands = 1,605 nests on NBC/8,173 nests rangewide = 0.196, using data provided in the 2006 California Department of Fish and Game California Least Tern Breeding Survey (Marschalek 2007).
- Nesting Threshold for the Least Tern = NP x R x NBCF = 5000 pairs x 1.143 nests/pair x 0.196 = 1,120 nests.

During consultation with the USFWS, this criterion was eliminated from consideration and replaced with different criterion (Section 1.5.5). The USFWS felt that the criterion was too complicated, and that a nesting threshold would not be scientifically defendable.

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

Currently, the Navy buffers and marks avoidance areas around each western snowy plover nest established on SSTC. The Navy considered placing caps on the number of concurrent western snowy plover nests buffered at SSTC, due to a concern that an increase in western snowy plover nesting population would adversely affect training.

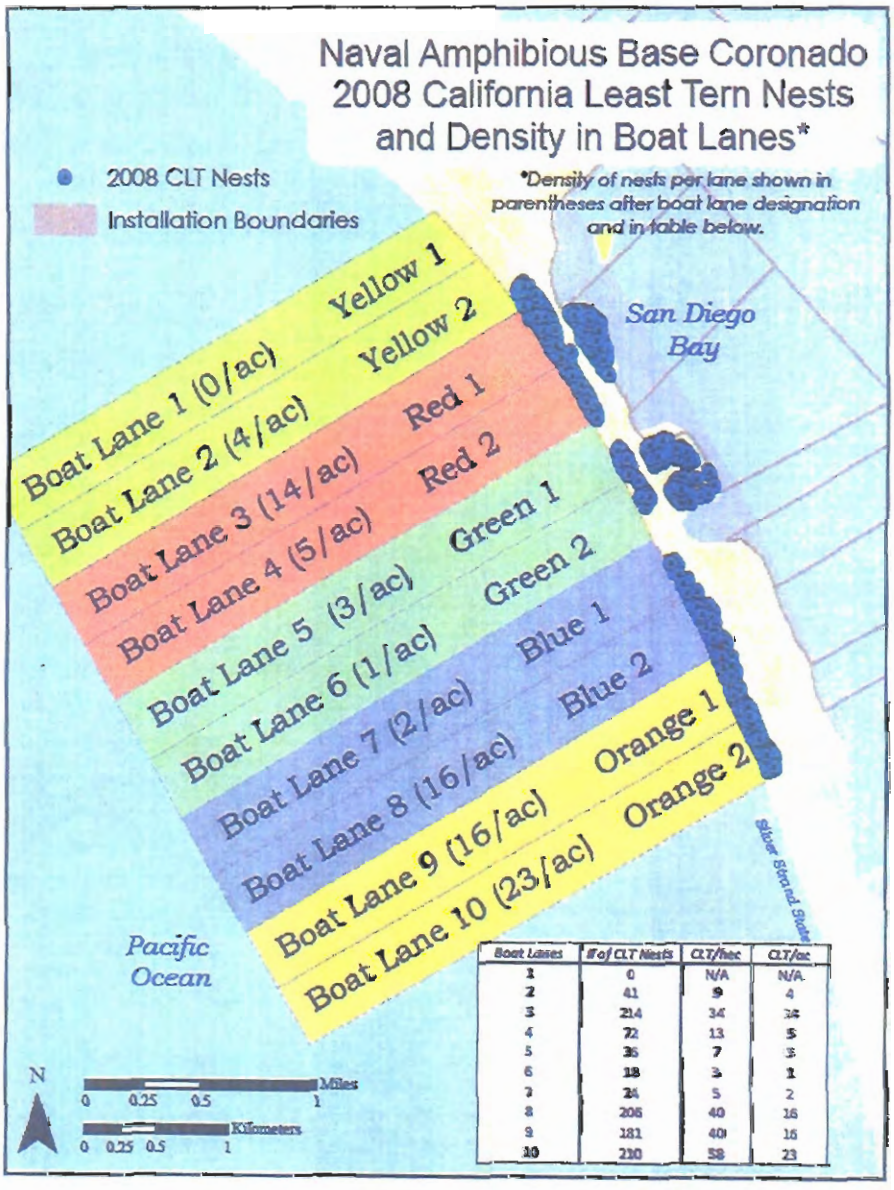
Under current training conditions, Navy training officers are notified of the location of the nests or buffers and plan their training activities to avoid entering the buffer areas. A few training activities, such as individual basic physical fitness activities, may be able to work around the training buffers. These activities incorporate identifying and avoiding plover nest buffer areas into the activity. Other training does not require use of beach areas and thus would not be affected by the presence of plovers. Most other training activities, however, are unable to operate around the buffers. The buffers are artifacts on the beach that do not occur in real world wartime situations, and adversely affect the value of training (e.g., presence of the plover nests restrict flexibility for maneuvering across the beach and inhibit real-time, tactical decision-making). Activities involving heavy equipment and vessels require large unconstrained

maneuvering space without encumbrances, precluding areas with buffered plover nests. To accommodate training requirements for these activities, the activities are often shifted in their entirety to the north or south, away from the buffers, so that personnel or equipment will not encounter the buffers. Under current conditions, this approach is feasible. Where needed, training activities can and are moved to other available training lanes that are free of plover nests or contain a maximum of two plover nests at one time. SSTC has historically typically had less than 22 maximum active nests at one time.

The Navy considered creating an avoidance cap of more than 22 concurrent western snowy plover nests, but found that approach could render some training lanes unusable. Twenty-two concurrent nests would translate into approximately two concurrent nests in each viable lane on SSTC (i.e., 14 training lanes excluding Beach Lanes 1, 5, and 6, which have not historically had nests due to the shallow beach and hummocks). If plover nests increase, buffering each nest will constrain the available beach area such that the beach will not adequately support military readiness training activities. Two nests per training lane at the same time by themselves could encumber 60 m of the 500-m beach lane width (12 percent). If the nests happen to be spaced closely together and/or close to the edge of the lane, the area in between the nests or between the nests and the edge of the lane may also become unusable for training (e.g., if there are 100 m between the nests and 50 m between the nests and the edge of the lane, then about 40 percent of the lane could be rendered unusable). Snowy plovers are not colony breeders and prefer to distance their nesting activities as far as they can from other nesting plovers. As such, plover nests are more likely to be evenly spaced and encumber larger, rather than smaller sections of the training beach. Also, as discussed above, many training activities require that an additional buffer be provided away from the staked buffers to ensure that the stakes are not visible or an encumbrance to personnel being trained. Adding a third nest per training lane could potentially render the entire lane unusable. With the anticipated increase in training tempo of the SSTC training beaches (see Section 1.5.1), training activities may not be able be moved to other less encumbered beach lanes like they can be and are under current conditions.

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

Figure 7. California Least Tern 2008 Nest Density at SSTC-N Beach Lanes*



* *Tern nest numbers in each lane in Figure 7 vary from those presented in Table 10, because this figure was derived from GIS data*

EXHIBIT NO. 6a
APPLICATION NO.
CD-033-10

Figure 6a. California Least Tern and Western Snowy Plover 2008 Nest Distribution at SSTC-N Beach Lanes Red 1 to Green 2.

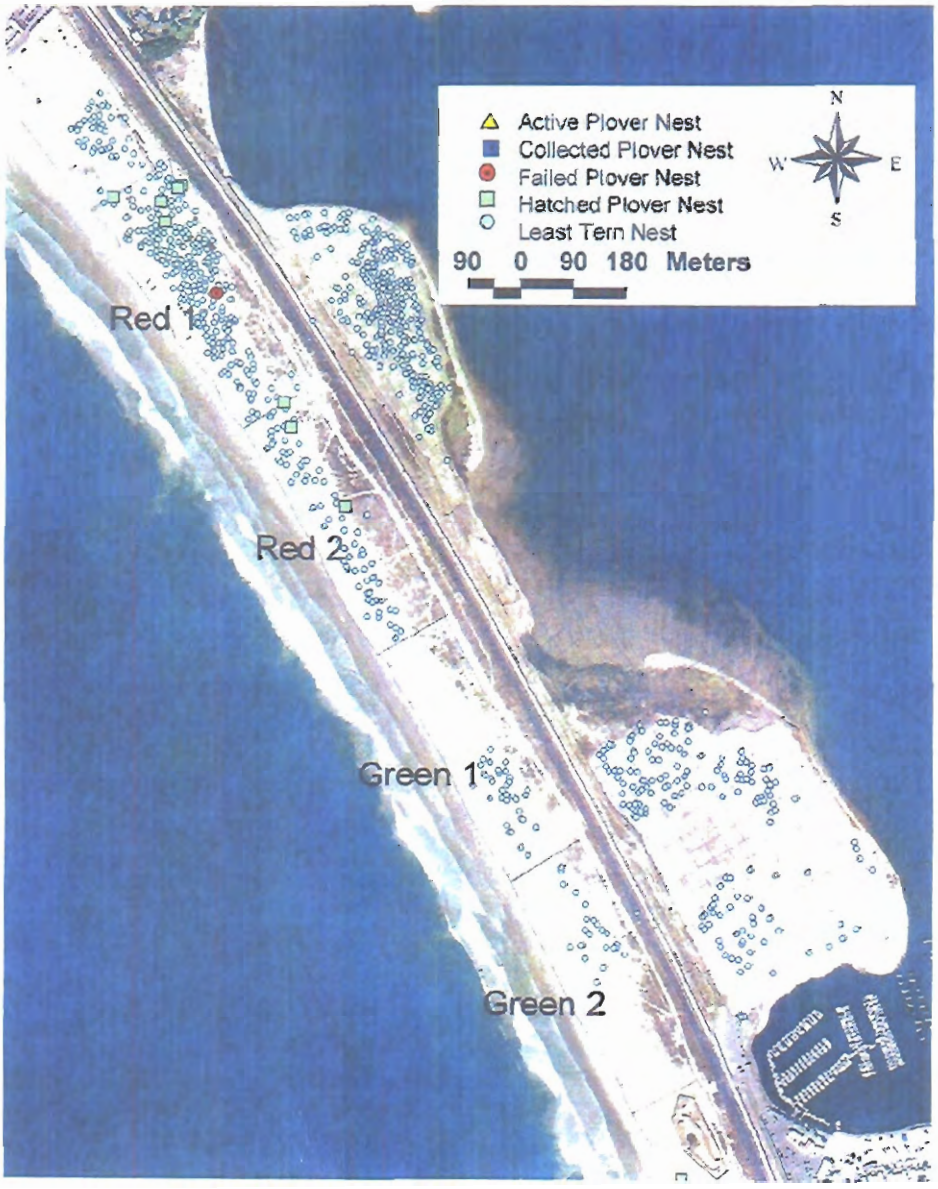


EXHIBIT NO. 6b
APPLICATION NO.
CD-033-10

Figure 6b. California Least Tern and Western Snowy Plover 2008 Nest Distribution at SSTC-N Beach Lanes Blue 1 to Orange 2.

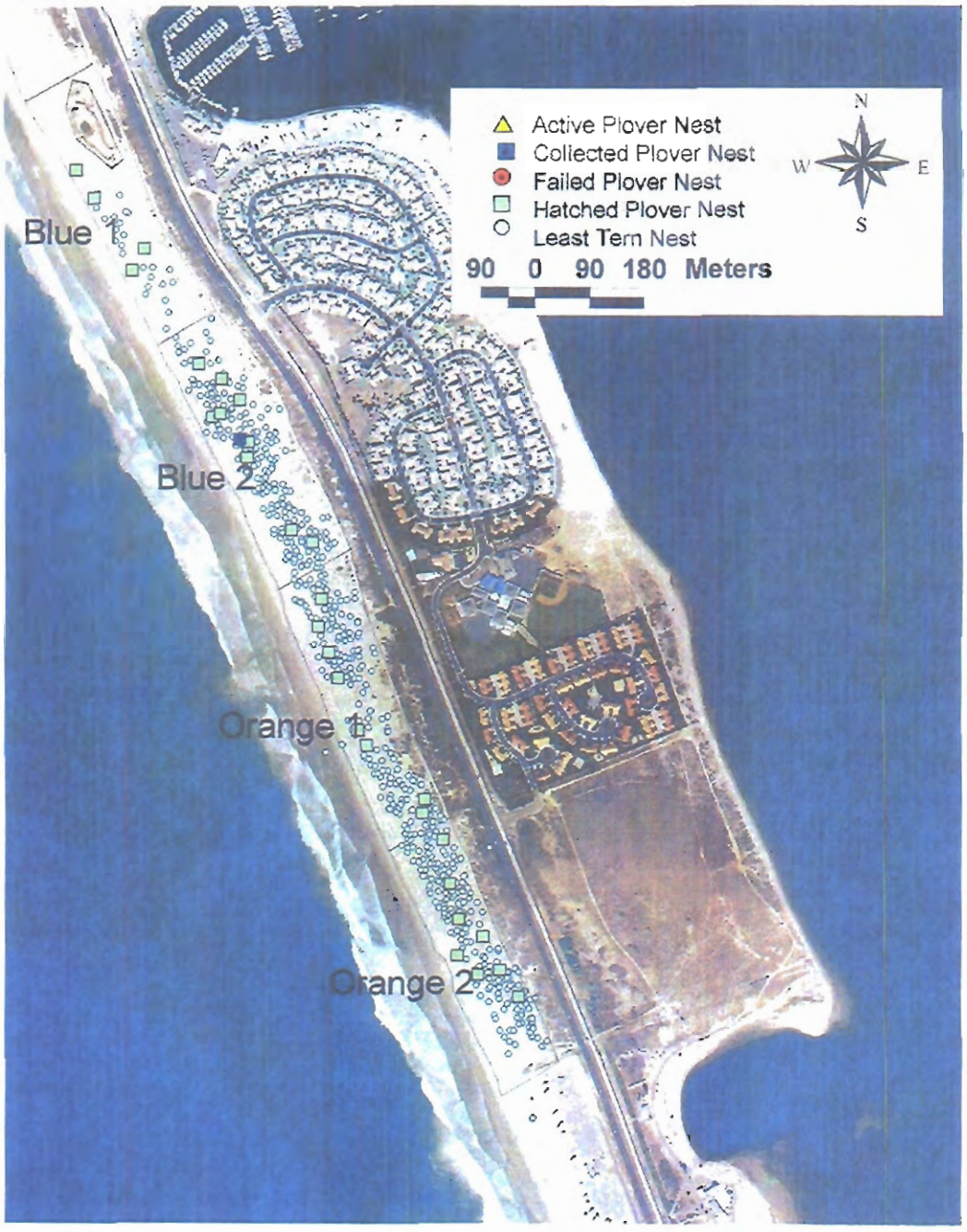


EXHIBIT NO. 6
APPLICATION NO.
CD-033-10

Figure 10. Location of Vernal Pools at SSTC-S

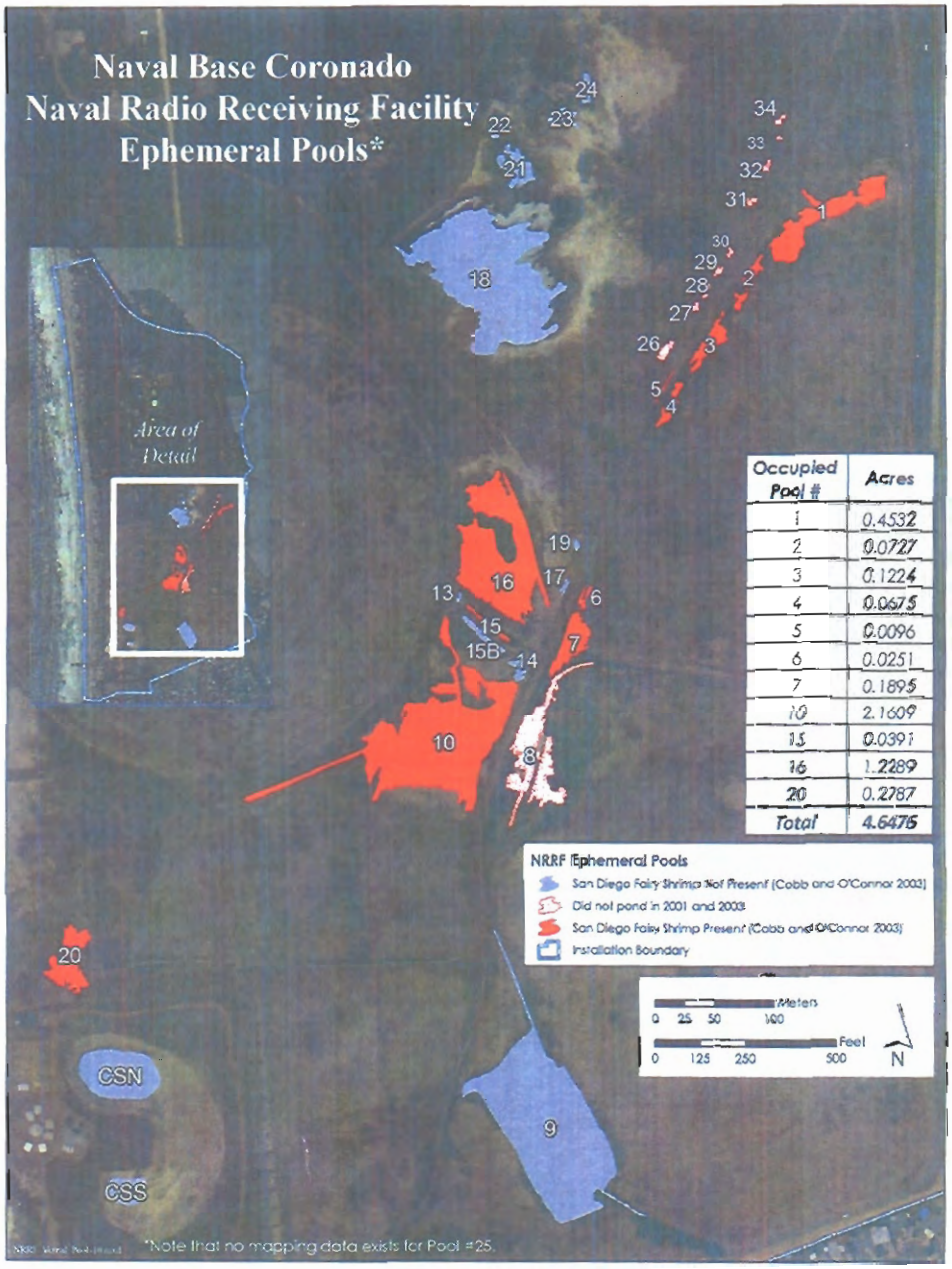


EXHIBIT NO. 7
APPLICATION NO.
CD-033-10

1

Table 2-1: Reasonably Foreseeable Effects on the Coastal Zone

Mission Area	No.	Activity	Effects by Resource								
			SSTC-S Beach[1]	SSTC Waters[2]	Water Quality	Marine Mammals	Eelgrass	Plover Nesting	Tern Nesting	Fish	Sea Turtles
Maneuver – Move Forces	1	Anchoring									
	2	Towing									
	3	Moor to Buoy									
Mine Counter-measures	4	Parachuting		x	x						
	5	MCM	x	x	x	x		x	x	x	x
	6	Floating Mine		x	x	x		x	x	x	x
	7	Dive Platoon		x	x	x		x	x	x	x
	8	VSW Operator Course									
	9	VSW MCM		x		x				x	x
	10	AUV/UUV		x		x				x	x
	11	MK8 Marine Mammal/MMS		x	x	x				x	x
	12	Mine Neutralization		x	x	x		x	x	x	x
	N1	SWAG		x	x	x				x	x
	N2	Surf Zone Test Detachment/ Equipment Test and Evaluation		x	x	x		x	x	x	x
	N3	UUV Neutralization		x	x	x		x	x	x	x
	N4	AN/AQS-20 Mine Hunting		x							
	N5	AN/AES-1 ALMDS		x							
	N6	AN/ALQ-220 OASIS		x							
	N7	AMNS		x	x	x				x	x
Maritime Interdiction	13	Visit, Board, Search, and Seizure									
Amphibious Operations	14	Small Boat Handling									
	15	Swimmer Conditioning – Bay and Ocean with fins		x				x	x		
	16	Basic Reconnaissance Course Final Mission	x	x				x			
	17	Obstacle Course						x	x		
	18	Hydrographic Reconnaissance	x	x				x	x		
	19	SUROBS						x	x		
	20	CRRC IBS/Surf Passage/ Boat Team Organization and Function		x				x	x		

Table 2-1: Reasonably Foreseeable Effects on the Coastal Zone (continued)

Mission Area	No.	Activity	Effects by Resource								
			SSTC-S Beach[1]	SSTC Waters[2]	Water Quality	Marine Mammals	Eelgrass	Plover Nesting	Tern Nesting	Fish	Sea Turtles
Amphibious Operations (continued)	21	CRRC Towing and High Speed Maneuver									
	22	CRRC LCU Launch and Recover- Bay and Ocean						x	x		
	23	CRRC Navigation, Bay and Ocean Runs						x	x		
	24	Amphibious Raid Course Final Mission	x					x	x		
	25	Amphibious Raid	x	x	x			x			
	26	Direct Action	x	x	x			x			
	27	Craft Landing Zone	x	x				x	x		
	N8	Tactical Recovery of Aircraft and Personnel	x	x	x			x			
Naval Special Warfare (NSW)	28	Swimmer/CRRC OTB Insertions/ Extraction with Pyrotechnics/ Blanks	x	x	x			x	x		
	29	OTB Stalk	x					x			
	30	Immediate Action Drills	x		x						
	31	Breacher Training									
	32	Amphibious Warfare	x		x			x	x		
	33	Mobility Primary Mission Area	x		x						
	34	Escape and Evasion			x			x	x		
	N9	Underwater Demolition Qualification/ Certification		x		x				x	x
	N10	Vehicle Patrolling and Testing						x	x		
	N11	NSW Underwater Demolition Training		x		x		x	x	x	x
Reconnaissance and Surveillance	35	HRST/Cast & Recovery		x	x						
	36	Rappel & Fast Rope Training									
	37	SDV/ASDS Certification to Deploy		x	x	x		x	x	x	x

Table 2-1: Reasonably Foreseeable Effects on the Coastal Zone (continued)

Mission Area	No.	Activity	Effects by Resource								
			SSTC-S Beach[1]	SSTC Waters[2]	Water Quality	Marine Mammals	Eelgrass	Plover Nesting	Tern Nesting	Fish	Sea Turtles
Logistics Over-the-Shore	38	OPDS		x			x	x	x	x	
	39	ABLTS		x			x	x	x	x	
	40	Barge Ferry Causeway/ Coxswain Training		x			x	x	x	x	
	41	Causeway Pier Insertion and Retraction		x			x	x	x	x	
	42	ELCAS		x		x	x	x	x	x	
	43	Establish Beach Party Command Post						x	x		
	44	Sterngate Marriage to Amphibious Ship/LCU; Embark Debark Welldeck		x							
	45	LCU/ LCM Beaching	x	x			x	x	x	x	
	46	LCU/LCM Towing/Being Towed		x			x	x	x	x	
	47	Communications Training						x	x		
	48	Field Training with a Beach Camp	x		x			x	x		
	49	MPS Offload						x	x		
	50	ROWPU	x					x	x		
	51	RRDF		x			x	x	x	x	
	52	MPFUB Operator Course		x			x	x	x	x	
	53	LARC V Operator Training		x				x	x		
NSW – Diving and Beach Operations	54	LAR V Closed Circuit Breathing Diving									
	55	Open Circuit Breathing Diving									
	56	OTB Field Training	x	x	x			x	x		
	57	Rock Portage	x	x				x	x		
NSW – Land Warfare	58	Land Patrolling	x		x			x	x		
	59	Immediate Action Drills	x		x			x	x		

1

Table 2-1: Reasonably Foreseeable Effects on the Coastal Zone (continued)

Mission Area	No.	Activity	Effects by Resource								
			SSTC-S Beach[1]	SSTC Waters[2]	Water Quality	Marine Mammals	Eelgrass	Plover Nesting	Tern Nesting	Fish	Sea Turtles
NSW – Advanced Training	60	OTB Insertion/Photo Reconnaissance	x		x			x			
	61	Photo Image Capture									
	62	Field Skills (Observation Drills, Sketching, Range Estimation)			x						
	63	Stalking, Movement, Hide-Sites						x			
	64	CQC/CQD	x					x			
	65	Communications									
	66	UAS Training									
	67	Around the World		x							
NSW – Physical Fitness Training	68	Physical Training Runs	x					x	x		
	69	Physical Conditioning Training									
	70	Swim Training		x							
	71	Hell Week	x	x	x						
	72	Rucksack March	x								
	73	Monster Mash	x								
Industrial and Environmental Health Services	74	Conduct Environmental Health Site Assessment	x								
Combat Area Hazards	75	Conventional Ordnance/IED Response	x					x	x		
	76	Land Mine Detection/ Neutralization	x					x	x		
Protect and Secure Area of Operations	77	Field Training Exercise (e.g., SEAHAWK)									
Combat Terrorism	78	Small Boat Attack									

Note: [1]Effects on public use of SSTC-S beaches below the mean high tide line; [2]Effects on public recreation in Pacific Ocean and San Diego Bay waters.

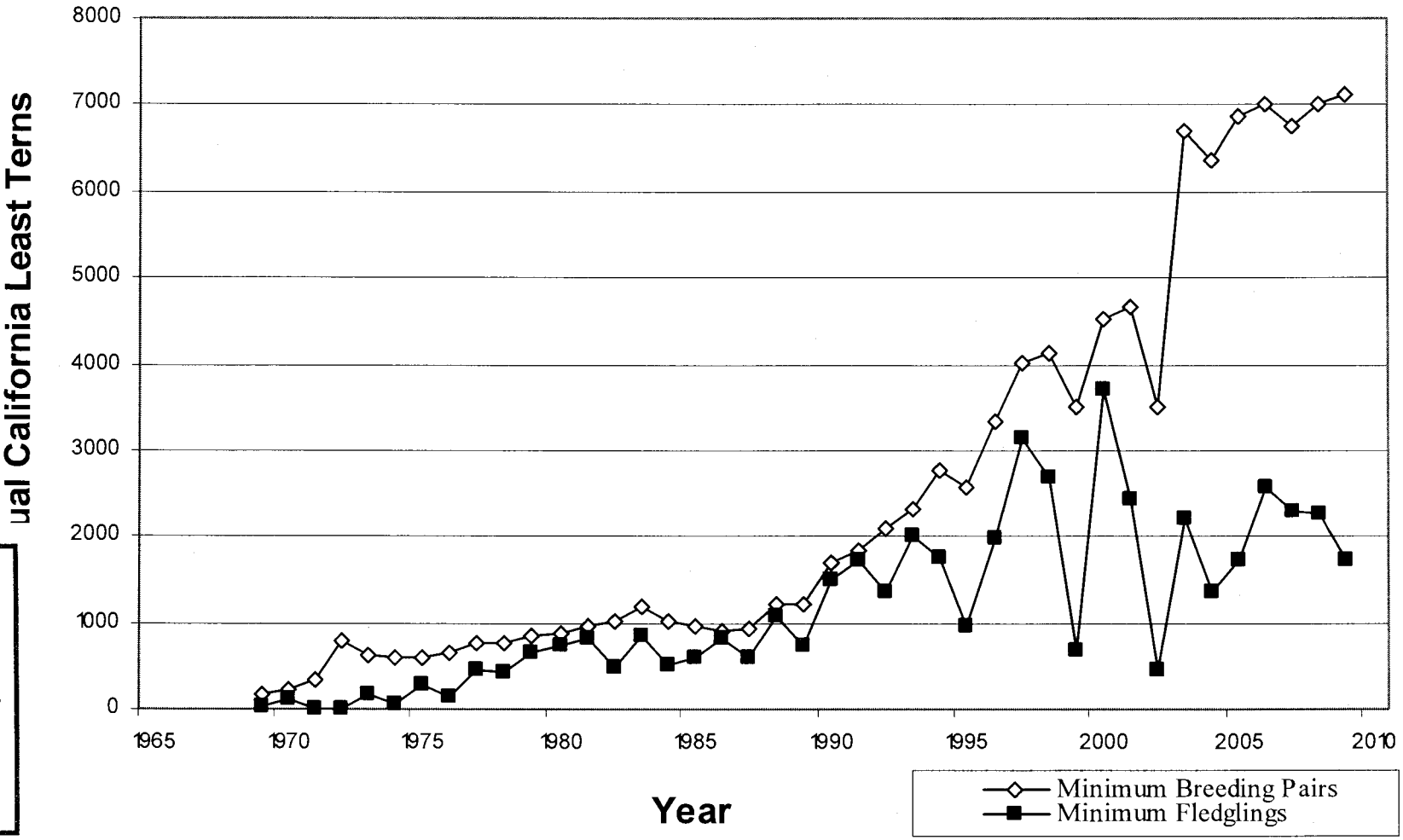


EXHIBIT NO. 9
APPLICATION NO. CD-033-10

Figure 2. Number of documented California least tern breeding pairs and fledglings in California during annual surveys, 1969-2009. (Data from: Craig 1971; Bender 1974a, 1974b; Massey 1975, 1988, 1989b; Atwood *et al.* 1977; Jurek 1977; Atwood *et al.* 1979; Collins 1984, 1986, 1987; Gustafson 1986; Johnston and Obst 1992; Obst and Johnston 1992; Caffrey 1993, 1994, 1995b, 1997, 1998: Keane 1998, 2000, 2001; Patton 2002, 2004 unpubl. Table; Marschalek 2005, 2006, 2007, 2008, 2009).

Table 10. Number and Distribution of California Least Tern Nests in Action Area

	1994	95	96	97	98	99	2000	01	02	03	04	05	06	07	08	09
							Delta Beaches (Bayside)									
Delta N	*210*	*177*	*224*	*349*	*337*	*344*	*229*	*271*	*257*	*285*	*263*	*351*	*223*	*224*	*295*	*413*
Delta S	*18*	*1*	*21*	*25*	*80*	*81*	*70*	*81*	*84*	*216*	*195*	*215*	*155*	*156*	*174*	*235*
Delta Beach Totals	**228**	**178**	**245**	**374**	**417**	**425**	**299**	**352**	**341**	**501**	**458**	**566**	**378**	**380**	**469**	**648**
							SSTC-N Beach (Oceanfront)									
Yellow 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Yellow 2	0	0	0	0	0	0	0	0	0	0	0	0	44	47	52	69
Red 1	0	0	0	0	1	0	0	0	0	9	*24*	70	206	142	231	248
Red 2	0	0	8	6	18	28	19	33	30	61	*50*	47	89	59	77	84
Green 1	0	13	21	27	68	101	81	*101*	*116*	*155*	*141*	108	56	32	37	29
Green 2	*1*	18	54	*46*	*48*	*58*	*54*	75	46*	71	*35*	42	19	19	22	23
Blue 1	0	0	1	0	0	6	6	7	8*	14	*13*	27	41	31	24	16
Blue 2	0	0	0	11	41	57	101	*126*	*108*	*138*	*130*	*97*	*232*	*132*	*209*	*221*
Orange 1	0	0	0	1	6	15	36	*69*	*57*	*69*	*69*	*77*	*145*	*146*	*173*	*152*
Orange 2	0	0	0	0	2	13	33	*52*	*36*	*106*	*115*	*102*	*215*	*174*	*230*	*251*
SSTC-N Beach Totals	**1**	**31**	**84**	**91**	**184**	**278**	**330**	**463**	**401**	**623**	**577**	**570**	**1047**	**782**	**1055**	**1093**
Total in Active Training Lanes	**0**	**31**	**84**	**45**	**136**	**220**	**276**	**115**	**84**	**155**	**0**	**294**	**455**	**330**	**443**	**469**
Totals in Protected Areas, Including Delta Beaches	*229*	*178*	*245*	*420*	*465*	*483*	*353*	*700*	*658*	*1124*	*913*	*842*	*970*	*832*	*1081*	*1272*
Action Area Totals	**229**	**209**	**329**	**465**	**601**	**703**	**629**	**815**	**742**	**1124**	**1035**	**1136**	**1425**	**1162**	**1524**	**1741**

- The number of nests, as recorded in this table, is greater than the number of tern pairs, because terns may re-nest after failure. For comparison, pair estimates for 2008 were 267 for Delta N, 162 for Delta S, and 906 for SSTC-N beach.
- The area that has protected from human disturbance has changed throughout the years. For each year, the italicized text and numbers highlight the areas that were marked and avoided (i.e., protected from human disturbances). Delta Beaches were protected in all years.

Table 1-3: Expanded Locations of Training Activities

#	Activity	Current Locations	Expanded Locations
1	Anchoring	All SSTC-N Boat Lanes 1-10	All SSTC-N Boat Lanes 1-10, Breakers Beach
19	SUROBS	All SSTC-N Beach Lanes 1-10	All SSTC Beach Lanes 1-14
31	Breacher Training	SSTC-S Inland (Bunker 98, Bunker 99 Interior)	SSTC-S Inland (Bunker 98, Northwest and east of Bunker 99, Bunker 99)
48	Field Training with a Beach Camp	All SSTC-N Beach Lanes 1-10	All SSTC Beach Lanes 1-14, SSTC-S Inland
49	MPS Offload	All SSTC-N Boat and Beach Lanes 1-10	All SSTC Boat and Beach Lanes 1-14, SSTC-S Inland
50	ROWPU	All SSTC-N Beach Lanes 1-10	All SSTC Beach Lanes 1-14, SSTC-S Inland
55	Open Circuit Breathing Diving	All SSTC-N Boat and Beach Lanes 1-10, Breakers Beach, Alpha-Hotel	All SSTC Boat and Beach Lanes 1-14, Breakers Beach, Alpha-Hotel
57	Rock Portage	All SSTC-N Boat and Beach Lanes 1-10, Breakers Beach, Zuniga Jetty, Coronado Rock Jetty	All SSTC Boat and Beach Lanes 1-14, Breakers Beach, Zuniga Jetty, Coronado Rock Jetty
75	Conventional Ordnance/ IED Response	All SSTC-N Beach Lanes 1-10	All SSTC Beach Lanes 1-14
76	Land Mine Detection/ Neutralization	All SSTC-N Beach Lanes 1-10	All SSTC Beach Lanes 1-14

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

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

1.5.5.2 Oceanside Beach Lanes 1 through 14

The Navy proposes to limit the number of western snowy plover (*Charadrius alexandrinus nivosus)* nests that will be marked and buffered for avoidance on SSTC-N and SSTC-S oceanside beaches to no more than 22 nests at one time. Staking would continue to mark the perimeter of a buffer zone with a diameter of 30 meters (m) or less around the western snowy plover nests. If more than 22 western snowy plover

Because the Navy will prohibit driving of vehicles off of established roads at SSTC-S Inland, no take of fairy shrimp is authorized or exempted for off-road vehicular activity at SSTC-S Inland.

EFFECT OF THE TAKE

In the accompanying biological opinion, we determined that the level of anticipated incidental take of California least terns, western snowy plovers, and San Diego fairy shrimp is not likely to result in jeopardy to these species.

REASONABLE AND PRUDENT MEASURES

The Service believes that the following reasonable and prudent measures are necessary and appropriate to minimize the impact of incidental take of California least terns, western snowy plovers, and San Diego fairy shrimp.

California Least Tern and Western Snowy Plover

1. The Navy will minimize the potential for incidental take of least tern and snowy plover nests and chicks at SSTC-N and SSTC-S Beaches during the breeding season;

2. The Navy will monitor training activities to ascertain the impact of training activities on least tern and snowy plover distribution within the action area and report any observed incidental take to the Service annually.

San Diego Fairy Shrimp

3. The Navy will use scheduling and/or planning measures to minimize the potential for incidental take of San Diego fairy shrimp;

4. The Navy will establish the baseline distribution and abundance of San Diego fairy shrimp and condition of their vernal pool habitat at SSTC-S Inland and monitor training activities to ascertain the impact of training activities on San Diego fairy shrimp distribution and abundance within the action area. The Navy will report the monitoring results and any observed incidental take to the Service annually, and

5. The Navy will manage the vernal pools occupied by San Diego fairy shrimp to minimize any training impacts detected by monitoring.

TERMS AND CONDITIONS

To be exempt from the prohibitions of section 9 of the Endangered Species Act, the Navy must ensure that their military personnel, including all agents and contractors anticipated herein, comply with the following terms and conditions, which implement the reasonable and prudent

measures described above and outline the required reporting/monitoring requirements. These terms and conditions are non-discretionary.

California Least Tern and Western Snowy Plover

The following terms and conditions implement reasonable and prudent measures 1 and 2:

1.1 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 to the maximum extent consistent with training needs.

1.2 The Navy will mark and buffer, as described in the proposed action, 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.

1.3 Under baseline conditions, the southern 3 beach lanes are marked to facilitate avoidance of tern and plover nests. Since the Navy has determined that the level of marking done under baseline conditions presents an impediment to training, the Navy will develop a marking strategy to delineate least tern and snowy plover nesting areas that does not encumber training activities. Such a marking strategy may entail signage affixed to existing beach lane sign posts and a limited number of additional markers, as determined appropriate by Navy staff.

1.4 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.

1.5 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.

1.6 NBC Natural Resources staff will brief all dog handlers, annually, or more frequently if necessary, of the following guidelines pertaining to the use of military working dogs on SSTC beaches.

1.6.1 Military working dogs and 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.

1.6.2 If physical conditioning on soft pack sand is necessary, handlers and military working dogs will run on the sand road (SSTC-N) or within 20 feet of the hard pack sand to reduce the disturbance and impact to nesting tern and plovers.

1.6.3 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 3 beach lanes until: a) completing a study to evaluate the effects of military working dogs on terns and plovers and b) coordinating with the Service to develop conservation measures to minimize any additional effects.

1.6.4 If military working dog training is requested as part of Platoon OTB activities at SSTC-N, the Platoon OTB activities will be scheduled in beach lanes Yellow 1, the northern half of Yellow 2, Green 1 or Green 2, pending the results of the Navy's study to evaluate the response of terns and plovers to military working dog presence.

1.6.5 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.

1.7 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.

2.1 The Navy will include the following information in the yearly reports to be submitted to the Service 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; g) the fledging numbers at NASNI, SSTC-N, and SSTC-S; and h) any measures taken to prevent additional tern or plover death or injury.

2.2 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.

San Diego Fairy Shrimp

The following terms and conditions implement reasonable and prudent measures 3, 4 and 5:

3.1 The Navy will avoid vernal pools occupied by San Diego fairy shrimp and their watersheds when designating parachute drop zones in SSTC-S Inland. The Navy will identify the vernal pools and assure that drop zones are located at least 30 m (100 ft) from each occupied pool.

3.2 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.

3.3 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) 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.

3.4 The Navy will assure that military dogs do not enter vernal pools at SSTC-S Inland year round.

4.1 The Navy will mark pools to facilitate monitoring, and monitor the occupied vernal pools and their watersheds at the SSTC-S Inland to determine the baseline and ongoing conditions regarding: San Diego fairy shrimp distribution and abundance; botanical resources; topography; hydrology; and water chemistry (including salinity). The Navy will submit a draft monitoring plan to the Service and allow the Service at least 30 days to review and approve this plan. The plan will include a map of SSTC-S Inland training area boundaries and vernal pools and their watersheds, and the following provisions to establish baseline conditions: a) focused invasive plant survey including visual/photopoint inspection of vernal pools and their watersheds; b) plant, topographic, hydrological and water quality surveys/data; and c) protocol fairy shrimp surveys of the vernal pools. The plan will outline the qualifications necessary for personnel that determine if all pools in a given unit are "dry", as well as the methodology for determining that the pools are dry. The plan will include the following provisions for monitoring ongoing conditions to determine if training impacts have occurred: a) focused invasive plant monitoring and visual/photopoint inspection of vernal pools and their watersheds annually; b) plant, topographic, hydrological and water quality monitoring every 2 years; and c) protocol fairy shrimp surveys of the vernal pools every 3 years. Annual monitoring reports will identify management measures to minimize any training impacts detected by monitoring (e.g., spread of invasive weeds, change in pool topography). The plan will identify measures to minimize the potential for adverse effects to fairy shrimp from weed abatement, pool restoration or pool augmentation. The results of each year's monitoring will be submitted to the Service annually. Baseline monitoring will be completed prior to initiating training activities in or around the vernal pools at SSTC-S Inland.

4.2 The Navy will install markers that indicate the pool number (as presented in DoN 2003) to aid monitoring.

5.1 The Navy will implement management measures identified in annual monitoring reports to minimize any impacts detected by monitoring (e.g., invasive weed control, correcting changes in pool topography).

CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the Act directs Federal agencies to use their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information. The recommendations provided here relate only to the proposed action and do not necessarily represent complete fulfillment of the Navy's responsibility for these species, pursuant to section 7(a)(1) of the Act.

1. We recommend that the Navy continue marking and avoiding suitable nesting habitat at the southern 3 beach lanes. As an option to the marking that has been successfully implemented and conducted in accordance with past consultations, we suggest markers be installed around the nesting area in a manner that accommodates linear travel along a corridor parallel to the beach crest. The markers could then be temporarily removed to accommodate training exercises that require use of one or more of the southern 3 beach lanes to meet the Navy's current need for increased training flexibility.

2. We recommend that the Navy continue to mark all plover nests on SSTC-N and SSTC-S Beaches with a buffer and avoid the buffered nest sites until they are not being used by plovers (e.g. until approximately 15 days post-hatch). If such marking cannot be done as in past consultations, we suggest that the size and configuration of buffered areas be adjusted to avoid impacts to training activities or that the Navy implement the measures used to move plover nests out of beach crossing lanes, to gradually relocate the plover nest so it does not affect the training activity.

3. Recreational use of the SSTC-Beach is occurring on the SSTC-Beaches and reducing the habitat suitability for snowy plovers and least terns. Recreational use of the beaches is counter to the NBC INRMP and the current proposed action. We recommend that the Navy obtain jurisdiction over SSTC-N Beach to facilitate improved enforcement within this area. We also recommend that the Navy improve delineations of base boundaries and increase enforcement to reduce the non-training uses of the Navy's beaches at SSTC. Specifically, we recommend that the Navy improve the delineation by: a) installing improved signage adjacent to the Carnation Avenue beach crossover, the jetty at SSTC-S, and the beach between SSTC-N and SSSB; b) installing a kiosk at Camp Surf, with security personnel stationed at the site to educate civilians about the need to keep dogs on leash and remain outside the boundaries of SSTC-S Navy-administered land; c) citing

violators and recording the number of violations, in collaboration with State Parks Rangers, City of Coronado Police, and Lifeguards; and d) installing a fence between Highway 75 and SSTC-N Beach to reduce the recreational trespass and other unauthorized entry. We recommend that the Navy improve enforcement by: a) preventing public access to SSTC-S where plovers nest; b) coordinating with the patrol assigned to Silver Strand State Beach (SSSB), the Imperial Beach Police Department, and the Coronado Police Department to enforce leash laws on any beach segments that are under State jurisdiction adjacent to the SSTC; c) contracting or hiring at least one full-time seasonal security position or Department of Defense Warden to eliminate recreational trespass and other unscheduled use onto the SSTC-N and SSTC-S Beaches.

4. Under the proposed action, the Navy, in coordination with the Service, will develop a Long Term Habitat Enhancement Plan for SSTC that will include portions of the Delta Beaches, SSTC-S, and SSTC-N Beach. In addition, cleanup and remediation activities are likely to be necessary at South Delta Beach (MRP site 5). We recommend that prior to initiating the breeding season training use of the southern 3 beach lanes at SSTC-N Beach, the Navy develop and implement the Long Term Habitat Enhancement Plan and remediate MRP Site 5. In this manner, additional suitable habitat will be available to offset the loss of habitat rendered unsuitable by increased frequency and extent of military training activity.

5. Plover habitat at NASNI Beach is increasingly affected by human uses, including dog walking, yet this area adjoins the currently designated "Coronado Dog Beach." The Coronado Dog Beach is within walking distance of the residences and Navy Lodge at NASNI. We recommend that the Navy re-establish the "no dogs" rule at NASNI Beach to improve conditions for the snowy plover. Individuals stationed on base could exercise dogs within Coronado Dog Beach to improve conditions for the plover and help the Navy meet the commitment to manage adequate habitat at NASNI to support 12 to 13 pairs of plovers (FWS-SDG-3908.3).

6. Increased foot traffic is expected at NASNI Beach as a result of Navy Lodge Expansion and increases in training. As foot traffic increases, less undisturbed area will be available for foraging plover chicks and adults at NASNI Beach. We recommend that the Navy reduce foot traffic at the western end of NASNI Beach, which lies within the surface danger zone of the small arms range, to improve the condiions for plovers. To reduce foot traffic into this area, we recommend that the Navy improve signage and improve delineation and enforcement of existing restrictions on pedestrian access. If these measures prove ineffective, we recommend that the Navy install a fence between the recreational beach and the western end of the NASNI Beach.

7. We recommend that the Navy, as previously recommended by the Service (FWS-SDG-3908.3), coordinate with the Army Corps of Engineers or other entities regarding sand replenishment on the western end of the NASNI Beach. This beach is used for plover nesting and foraging under baseline conditions; however, the narrow width of the beach results in inundation under high tides. Widening this beach by sand replenishment would

increase the area available for plover nesting and foraging that is not subject to recreational foot traffic.

8. We recommend that if lands adjacent to SSTC become available for acquisition or lease, the Navy explore the potential for acquisition or lease of these areas for their conservation and buffer values. Acquisition or lease of adjacent lands would allow the Navy to buffer training areas from adjacent recreational use and provide added ability to accomplish conservation objectives while reducing encumbrances on training areas.

9. We recommend that the Navy fence the limits of vernal pools that are occupied by the San Diego fairy shrimp at SSTC-S Inland. Fencing the pool boundaries would facilitate avoidance of the pools during training exercises.

10. This consultation on the effects of Navy training activities at SSTC has been complicated by the uncertainties associated with the frequency and location of training activities that occur under baseline conditions. The Navy has produced scheduling models that we used to project the future intensity of beach use and resulting impacts. However, uncertainty remains regarding the baseline distribution of training activities as it relates to the observed least tern and snowy plover nesting distribution, and the future training patterns and associated impacts of the proposed action. Based upon the available data, training activities at historical and proposed levels, if managed appropriately, appear compatible with persistence of the least tern and western snowy plover at SSTC. To improve future assessment of training activities and associated effects to the tern and plover, we recommend that the Navy annually report the timing, number, type and distribution of training activities in each training lane during the tern and plover breeding seasons, to the extent consistent with national security. This information may then be compared to that year's distribution of least terns and snowy plovers at SSTC-N when the Service and the Navy conduct a post-breeding season assessment of incidental take within the action area. Information about training will be useful to determine if any observed population declines were caused by training activities or some other factor such as predation.

REINITIATION NOTICE

This concludes formal consultation on the proposed action. As provided in 50 CFR § 402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and if (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action.

We appreciate the Navy's efforts to improve the status of the endangered and threatened species on the Silver Strand Training Complex while implementing its military mission. We also

Table 3. Regional productivity comparison, 2009.

Region	Breeding Pairs**	Proportion of Total	Fledglings**	Proportion of Total	Fledgling:Pair*
San Francisco Bay Area (w/Bufferlands)	417	0.059	327	0.188	0.784
San Luis Obispo/Santa Barbara/King Counties	59	0.008	69	0.040	1.169
Ventura County	619	0.087	217	0.125	0.351
Los Angeles/Orange County	1551	0.218	557	0.321	0.359
San Diego County	4482	0.629	565	0.326	0.126
Total	7128	1.000	1735	1.000	0.243

* This is not the minimum fledgling-to-breeding pair ratio since the maximum number of pairs is not used.
** Breeding pair and fledgling numbers represent the minimum number recorded if a site reported a range of abundance.

As in the past, the number of breeding pairs generally corresponds more closely to the number of nests, eggs, and chicks than the number of fledglings (Table 4). Camp Pendleton, Naval Base Coronado, Batiquitos Lagoon Ecological Reserve, and Pt. Mugu had the highest number of breeding pairs, nests, eggs, and chicks in the state in 2009. The five sites with the most fledglings produced differed due to different survival rates at each site. Bufferlands (2.00), Vandenburg AFB (1.19), and Oceano Dunes (1.12) are the only three sites that had a minimum fledgling-to-pair ratio greater than one.

Table 4. Top five nesting sites with highest observed number of breeding pairs, nests, eggs, chicks and fledglings (actual number observed in parenthesis).

Breeding Pairs	Nests	Eggs	Chicks	Fledglings
Camp Pendleton (1639)	Naval Base Coronado (1741)	Camp Pendleton (3031)	Naval Base Coronado (2184)	Bolsa Chica (265)
Naval Base Coronado (1463)	Camp Pendleton (1718)	Naval Base Coronado (3002)	Camp Pendleton (2123)	Alameda Point (252)
Batiquitos (576)	Batiquitos (649)	Batiquitos (1178)	Batiquitos (975)	Batiquitos (212)
Pt. Mugu (495)	Pt. Mugu (628)	Pt. Mugu (1081)	Pt. Mugu (593)	Camp Pendleton (179)
Huntington Beach (413)	LA Harbor (435)	Huntington Beach (759)	Huntington Beach (578)	Pt. Mugu (133)

A few sites constituted the majority of breeding activity for the state in 2009, which is a trend observed in the past (Caffrey 1994, 1995b, 1997, 1998; Marschalek 2005, 2006, 2007, 2008, 2009). Five sites (Camp Pendleton, Naval Base Coronado, Batiquitos Lagoon Ecological Reserve, Pt. Mugu, and Huntington State Beach) had over 400 minimum breeding pairs, which

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Naval Facilities Engineering Command, Southwest
Attention: Mr. Kent Randall
Silver Strand Training Complex EIS
1220 Pacific Highway, Building 1, 5th Floor
San Diego, CA 92132

March 30, 2010

Re: Silver Strand Training Complex Draft Environmental Impact Statement

I have attempted to submit my comments via the website and encountered the 5,000 character limitation. I am emailing my comments to Mr. Randall and will also mail a copy of my comments which will be postmarked March 30, 2010 but clearly will not be received on this date as called for on the website. Given the length of the document and the complexity of the issues the limited comment space does not seem adequate.

I appreciate the opportunity to comment and while I have been employed as a contractor privileged to work with the endangered birds at Naval Base Coronado I am making my comments as a private individual using only publicly available information. I applaud the Navy's many years of efforts on behalf of natural resources at their facilities at NBC. The military and particularly the Navy deserve the primary credit for increases in the population of the California least tern having pioneered the methods and set the standards that are now applied at successful sites throughout the range. Because of their outstanding efforts the Navy has been given significant regulatory acknowledgement to address the constraints imposed by the presence of such species as the least tern and the Western snowy plover. The benefits to the terns of this bargain and the significance of these efforts were clear in 2009, when NBC supported 22 percent of the least tern nesting attempts in California. NBC also supported the second largest population of nesting snowy plovers in Recovery Unit 6 and fledged as many young as sites with larger populations.

This Environmental Impact Statement (EIS) represents a lengthy effort to identify Navy training needs and points of conflict between endangered species' management and to address potential resolution of those conflicts. However, the document does not satisfy the National Environmental Policy Act (NEPA) mandate to provide clear and complete effects analysis. Among the critical missing information is a thorough description of the current status of the California Least Tern and the Western Snowy Plover neither of which is faring well. Also, not included is a discussion of the importance of the affected areas to the survival and recovery of these species. The absence of an adequate discussion of these issues in the EIS does not inform the public regarding the potential consequences of the proposed actions.

The absence of the Biological Opinion (BO), the U.S. Fish and Wildlife Service's (FWS) review and response to the proposed actions, from this Draft EIS fatally handicaps the ability of the public to review the consequences of the proposed actions. The outcome of a jeopardy determination is unknown and the

analysis supporting that determination is not available. The discussion of the complexity of the endangered species issues, e.g., downward population trends, plover adult mortality, unresolved predator issues, variation in management approaches, lack of control of public access, and perhaps most importantly the take allowances, reasonable and prudent alternatives and terms and conditions that will be applied to minimize loss, is not provided in the EIS and will be accessible at best only in the Biological Opinion. The EIS should I do not believe the public can adequately evaluate the impacts of the proposed alternatives until that BO is included. The 30-day time period between circulation of a Final EIS and publication of the Record of Decision would be inadequate to review the relationship between the Biological Opinion and the proposed actions and therefore the EIS should be re-circulated as a Draft including the Biological Opinion or a Supplemental EIS should be prepared and re-circulated as a Draft to allow the provision of adequate information for the public to make informed decisions.

Since 2001, Least Tern reproductive success in San Diego County has been declining with the steepest drops being seen at sites around San Diego Bay. This downward population trend is not addressed in the EIS. Methods for calculating population figures are under review and are relevant to providing a clear picture of the status of the species prior to approval of increased adverse effects. In 2009, only 72 young least terns fledged from Naval Base Coronado sites from 3,232 eggs laid and 2,364 chicks hatched. The losses are in no way attributable to the Navy, which has been diligent in attempting to reduce the predation that is the primary cause of these losses but it is nonetheless in this context that increased take is being sought by the Navy. It is NBC's 22 percent of the statewide population that suffered near complete reproductive failure in 2009. Both the increasing reliance on NBC and San Diego County military facilities to support the tern population and the declining populations at these sites suggests a need for the most diligent evaluation of projects that may adversely affect these birds. The status of the tern population and its current instability is information that is fundamental in an adequate environmental document. An emergency update of the California Least Tern Recovery Plan would serve the Navy and the public well by addressing the dynamic population numbers of the Least Tern and reconciling inconsistent interpretations of the status of the species.

In 2009, NBC supported almost one third of the snowy plover nesting population in San Diego County. Unfortunately, while the population numbers have wavered , breeding bird survey results in 2009 showed the entire coastal population from Washington to San Diego to be down by 12 percent from what was recorded in 2005 despite aggressive management efforts throughout the range. The minimum number of pairs at NBC in 2009 was only 35. In addition to problems of predation and habitat loss, in San Diego there has been a continuing occurrence of unexplained adult mortality with 15 adults found sick or dead at NBC in 2009 alone. This gloomy context needs to be clearly provided in the EIS to enable the public to evaluate the potential consequences of project approval. The breeding population goals identified in the 2007 Recovery Plan are far from being met in Southern California's Recovery Unit 6 with the only areas moving toward those goals being those that will be affected by this project proposal.

Knowing how dramatically the nest numbers of the terns on the beach increased at NAB Ocean, I can understand that someone unfamiliar with plover biology might be fearful of the same kind of problem arising with the plovers. However, their nesting strategies are completely different. Neither snowy plovers nor any of their relatives nest in dense colonies anywhere in the world.

The snowy plover population in Recovery Unit 6 is unstable, has not met the Recovery Unit goals, and needs more aggressive management not less. The call for a cap on the number of plover nests to be protected is seemingly contrary to the mandate to recover this species. The justification offered for the cap suggests a misunderstanding of how plover nests are protected and does not take advantage of other opportunities to support training and minimize take. In 2.1.3.7. in the discussion of the proposed cap, protecting no more than 22 simultaneously active plover nests in SSTC-S and N combined, is identified as the only way to prevent the presence of protected plover nests from rendering the beach lanes unusable.

This is apparently based on some assumptions which are not correct or are not likely to occur. While the worst-case scenario could occur in which three plover nests would be established in a line at the crest 30m apart, this would not result in establishment of protected areas that would preclude the use of a beach lane. The size and configuration of the buffers provided for the plover nests is not to exceed 30m on a side but is often much smaller . The presence of 3 simultaneously active nests in the training lanes occurred twice in 2009 once in Yellow 2 and once in Red 1, the most heavily used training beaches at NAB Ocean. The calculation that 22 simultaneous nests would equal 2 nests per training lane is somewhat misleading as plover nests have historically been established in 9 of the 10 beach lanes at NAB Ocean and five of six beach lanes at NRRF (4 of them are training lanes) = ~1.67 nests per lane.

The provision of protected beach lanes has resulted in a clear concentration of plover nests in the protected lanes with 60 percent of the nests at NAB Ocean being established in those protected areas in 2009, achieving the goal of minimizing the effects of plovers on training and maximizing their nesting potential. Adding training in the protected lanes may disperse nesting into fully active training lanes and increase the likelihood of plover loss while decreasing the protection provided. The creation of the protected areas was a minimization measure which was successful but removal of protection should require more mitigation not lessen the existing protection with a cap. Without the Biological Opinion it is not possible to know how FWS has viewed this adverse result, what additional take if any would be allowed, how the allowance is justified, and what compensation is required to mitigate for the increased vulnerability.

In many weeks, three of the training lanes at a time supported two active plover nests each. The calculation that 2 nests would obstruct 12 percent of a lane is misleading. While 60m is approximately 12% of the length of a lane, even if the nests were lined up in a way that resulted in a 60m long line the actual acreage of the area protected by maximum buffers provided for two nests is only 0.4 acres (30mx30m square) – only 3 percent of the acreage of the smallest training lane.

The protected beach lanes offer a benefit in concentrating plover nesting and tern nesting contributing to a reduction in the number of nests in the regularly used training lanes and the potential for interference with training. Nesting density was higher in the protected beach lanes (8, 9, and 10) with a maximum of 5 simultaneous active plover nests occurring in a single lane at one time. Even with 5 simultaneous active nests protected by the maximum 30m square buffers the smallest beach lane would have no more than 8 percent of the lane lost to the protected plovers.

Even with 22 nests, simultaneously active, in beach training lanes with each given the maximum 30m square the acreage removed from training availability would be less than 4.4 acres of the 191+ acres available (128 – NAB Ocean; 63.9 – SSTCS). If all 22 simultaneously active nests were established only at NAB Ocean, using the maximum buffer they would occupy 3 percent of the training lane acreage. If the number of simultaneously active nests were doubled to 44 but the buffer was halved the area occupied between SSTCS and SSTCN would still be only 2 percent of the beach. This is but one minimization measure that might be recommended if needed. Again, the absence of the Biological Opinion does not allow the public to evaluate the consequence of the proposed actions.

Knowing how dramatically the nest numbers of the terns on the beach at NAB increased, I can understand that someone unfamiliar with plover biology might be fearful of the same kind of problem arising with the snowy plovers. However, their nesting strategies are different with a small number of birds relying on repetitive nesting. This is not a species that nests in large or dense colonies. Even the current density found at NBC is exceptional. Management alternatives should be based on sound biology.

There is not adequate compensation identified for increased losses of terns and plovers that may occur as a result of heightened training tempo in what are the most concentrated nesting areas, The lack of

adequate compensation is of particular concern in light of the continued reproductive failures at these sites for the last eight years.

The level of unrestricted public use of all the training areas is not accurately portrayed with the beaches at NAB Ocean being described as closed to the public when there is continual recreational activity. The beaches at NAB Ocean are used constantly by the public coming both from Coronado and from Silver Strand State Beach as well as by people from nearby military housing. Despite military presence, suspected vandalism of snowy plover nests and take of snowy plover chicks has been documented at NRRF. Vandalism of Navy property in the training lanes is also a regular occurrence. Off-leash dogs are constantly present at NRRF. The signs providing rules and identifying training areas are few, many of them have fallen down, some are covered with graffiti, and all are ignored. There is currently little to no enforcement by military personnel of restrictions on recreational activity. The ability to control public recreational activity is critical to any successful resources program regardless of the project alternative approved.

I applaud the efforts the Navy has expended in its management of endangered species at NBC and it is the Navy's demonstrated ability to support both training and natural resources that has set the standard for resource management.

Sincerely,

Elizabeth Copper

The severity of physiological effects decreases with decreasing exposure (acoustic or blast-wave) and/or increasing distance from the sound source. The same generalization does not consistently hold for behavioral effects because they do not depend solely on received sound levels. Behavioral responses also depend on an animal's learned responses, innate response tendencies, motivational state, the pattern of the sound exposure, and the context in which sounds are presented. However, to provide a tractable approach to predicting acoustic impacts that is relevant to the terms of behavioral disruption described in the MMPA; it is assumed herein that the severity of behavioral effects also decreases with decreasing sound exposure and/or increasing distance from the sound source. Figure 3.9-1 shows the relationships between severity of effects, source distance, and sound exposure as defined in this EIS.

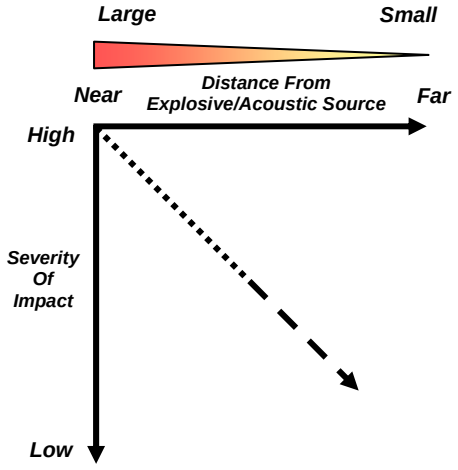

Figure 3.9-1: Relationship between severity of Effects, Source Distance, and Exposure Level

3.9.2.2.4 Level A and Level B Harassment

Categorizing potential effects as either physiological or behavioral effects allows them to be related to the harassment definitions. For military readiness activities, MMPA Level A harassment includes any act that injures or has the significant potential to injure a marine mammal or marine mammal stock in the wild. Injury, as defined in this LOA request and previous rulings (NOAA 2001, 2002a, 2008b, 2008c), is the destruction or loss of biological tissue from a species. The destruction or loss of biological tissue will result in an alteration of physiological function that exceeds the normal daily physiological variation of the intact tissue. For example, increased localized histamine production, edema, production of scar tissue, activation of clotting factors, white blood cell response, etc., may be expected following injury.

Therefore, this EIS assumes that all injury is qualified as a physiological effect and, to be consistent with prior actions and rulings (NOAA 2001, 2008b, 2008c), all injuries (slight to severe) are considered MMPA Level A harassment. Public Law 108-136 (2004) amended the MMPA definitions of Level B harassment for military readiness activities, which applies to this action. For military readiness activities, MMPA Level B harassment is defined as "any act that disturbs or is likely to disturb a marine mammal or marine mammal stock by causing disruption of natural behavioral patterns including, but not limited to, migration, surfacing, nursing, breeding, feeding, or sheltering to a point where such behaviors are abandoned or significantly altered." Unlike MMPA Level A harassment, which is solely associated with physiological effects, both physiological and behavioral effects may cause MMPA Level B harassment.

For example, some physiological effects (such as TTS) can occur that are non-injurious but that can potentially disrupt the behavior of a marine mammal. These include temporary distortions in sensory tissue that alter physiological function, but that are fully recoverable without the requirement for tissue replacement or regeneration. For example, an animal that experiences a temporary reduction in hearing

sensitivity suffers no injury to its auditory system, but may not perceive some sounds due to the reduction in sensitivity. As a result, the animal may not respond to sounds that would normally produce a behavioral reaction. This lack of response qualifies as a temporary disruption of normal behavioral patterns—the animal is impeded from responding in a normal manner to an acoustic stimulus. The harassment status of slight behavior disruption has been addressed in workshops, previous actions, and rulings (NOAA 2001, 2008b, 2008c; DoN 2001a). The conclusion is that a momentary behavioral reaction of an animal to a brief, time-isolated acoustic event does not qualify as MMPA Level B harassment. A more general conclusion, that MMPA Level B harassment occurs only when there is "a potential for a significant behavioral change or response in a biologically important behavior or activity," is found in recent rulings (NOAA 2002a, 2008b, 2008c). Public Law 108-136 (2004) amended the definition of MMPA Level B harassment for military readiness activities, which applies to this action. For military readiness activities, MMPA Level B harassment is defined as "any act that disturbs or is likely to disturb a marine mammal or marine mammal stock by causing disruption of natural behavioral patterns…to a point where such behaviors are abandoned or significantly altered."

Although the temporary lack of response discussed above may not result in abandonment or significant alteration of natural behavioral patterns, the acoustic effect inputs used in the acoustic model assume that temporary hearing impairment (slight to severe) is considered MMPA Level B harassment. Although modes of action are appropriately considered, the conservative assumption used here is to consider all hearing impairment as harassment from TTS. As a result, the actual incidental harassment of marine mammals associated with this action may be less than predicted via the analytical framework.

To assess the potential for harassment, two quantities are of interest:

- The number of animals with probability of being present in the zone of influence (ZOI) for injury but not detected.
- The expected number of marine mammals within various radii of the detonation point (i.e., ZOI ranges for mortality, injury, and behavioral disruption) is included in the considerations. This quantity is ordinarily referred to as "incidental take."

For this EIS, estimates of the numbers of species within the harassment zones and exposed to the various sound sources were calculated assuming that none of the current mitigation measures routinely used for SSTC activities were implemented. Harassment that may result from Navy activities described in this EIS is unintentional and incidental to those activities.

3.9.2.2.5 Harassment Zones

The volumes of ocean in which Level A and B harassment are predicted to occur are described as harassment zones. All animals predicted to be in a zone are considered "exposed" within the applicable harassment category.

The Level A harassment zone extends from the source out to the distance and exposure where slight injury is predicted to occur. The acoustic exposure that produces slight injury is the threshold value defining the outermost limit of the Level A harassment zone. A dual criterion approach promulgated by NMFS rulemaking was used to determine potential impact ranges for Level A (Table 3.9-2). Criterion included 100 percent mortality, which could occur from either maximum shock wave pressure or bulk cavitation, and slight injury. Slight injury included onset gastro-intestinal tract injury, which could occur from maximum shock wave pressure, and onset permanent threshold shift (PTS) which could occur from either maximum shock wave pressure or weighted energy flux density. Use of the threshold associated with the onset of slight injury (onset PTS) as the most distant point and least injurious exposures account of all more serious injuries by inclusion within the Level A harassment zone.

The Level B harassment zone begins just beyond the point of slightest injury and extends outward from that point. It includes all animals that may potentially experience Level B harassment. Physiological effects extend beyond the range of slightest injury to a point where slight temporary distortion of the most sensitive tissue occurs, but without destruction or loss of that tissue. The animals predicted to be in this zone experience Level B harassment by virtue of temporary impairment of sensory function (i.e., altered physiological function) that can disrupt behavior. Beyond that distance, the Level B harassment zone continues to the point at which no biologically significant behavioral disruption is expected to occur. Onset of temporary impact criterion included onset TTS which could occur from either maximum shock wave pressure or weighted energy flux density.

3.9.2.2.6 Auditory Tissues as Indicators of Physiological Effects

The mammalian auditory system consists of the outer ear, middle ear, inner ear, and central nervous system. Sound waves are transmitted through the outer and middle ears to fluids within the inner ear. The inner ear contains delicate electromechanical hair cells that convert the fluid motions into neural impulses that are sent to the brain. The hair cells within the inner ear are the most vulnerable to overstimulation by noise exposure (Yost 1994). Very high sound levels may rupture the eardrum or damage the small bones in the middle ear (Yost 1994). Lower level exposures may cause permanent or temporary hearing loss—called a noise-induced threshold shift or simply threshold shift (TS) (Miller 1974; Ward 1997). A TS may be permanent, called a permanent threshold shift (PTS), or temporary, called a TTS. Still lower exposures may result in auditory masking interfering with an animal's ability to hear other concurrent sounds.

A TTS is a result of auditory system fatigue following stimulation. The fatigue is believed to be caused by temporary changes in neural function, hair-cell function, and reductions in oxygen availability within the inner ear fluids. Collectively, these qualify as physiological changes that would exceed the normal daily variation in physiological function specific to those components of the auditory system. A PTS results from injury, which may occur at multiple levels of the auditory system. Tissue destruction can produce both localized and distributed variations in physiology depending on the type, location, and magnitude of the injury. With respect to auditory tissues, destruction of tissues associated with PTS would, at a minimum, result in localized changes in the physiology of the tissue that exceeds its normal daily variation in physiological function. Therefore, both TTS and PTS are physiological effects.

The amount of TS depends on the amplitude, duration, frequency, and temporal pattern of the sound exposure. Threshold shifts increase with the amplitude and duration of sound exposure. For continuous sounds, exposures of equal energy would lead to approximately equal effects (Ward 1997). For intermittent sounds, less TS occurs from continuous exposure with the same energy; further, some recovery occurs between exposures (Kryter et al. 1966, Ward 1997). The relationships between sound exposure parameters and resulting TS are not well understood for impulsive sounds. The TSs from impulsive sounds are more difficult to characterize than TSs from continuous-type sounds, in part because of the wide variety of impulsive sound waveforms that may be encountered (Hamernik et al. 1991).

The magnitude of TS normally decreases with the amount of time post-exposure (Miller, 1974). The amount of TS just after exposure is called the initial TS. If the TS eventually returns to zero (i.e., the threshold returns to the pre-exposure value), the TS is a TTS. Because the amount of TTS depends on the time post-exposure, it is common to use a subscript to indicate the time in minutes after exposure (Quaranta et al. 1998). For example, TTS_2 means a TTS measured two minutes after exposure. If the TS does not return to zero but leaves some finite amount of TS, that remaining TS is a PTS. The distinction between PTS and TTS is based on whether there is a complete recovery of TS following a sound exposure.

3.9.2.2.7 Mortality and the Level A Harassment Zone

Within the Level A harassment zone is a sub-region in which animals exposed to the blast are not expected to survive. Marine mammals can be killed by underwater explosions due to the response of air

cavities, such as the lungs and bubbles in the intestines, to the shock wave (Elsayed 1997, Elsayed and Gorbunov 2007). The criterion for mortality used in this EIS is the onset of extensive lung hemorrhage. Extensive lung hemorrhage is considered debilitating and potentially fatal as a result of air embolism or suffocation. In this EIS, all marine mammals within the calculated radius for onset of extensive lung injury (i.e., onset of mortality) are counted as lethal exposures. The range at which onset of extensive lung hemorrhage is expected to occur is greater than the ranges at which 50 to 100 percent lethality would occur from closest proximity to the charge or from presence within the bulk cavitation region. (The region of bulk cavitation is an area near the surface above the detonation point in which the reflected shock wave creates a region of cavitation within which smaller animals would not be expected to survive.) Because the range for onset of extensive lung hemorrhage for smaller animals exceeds the range for bulk cavitation and all more serious injuries, all smaller animals within the region of cavitation and all animals (regardless of body mass) with more serious injuries than onset of extensive lung hemorrhage are accounted for in the lethal exposures estimate. The calculated maximum ranges for onset of extensive lung hemorrhage depend upon animal body mass, with smaller animals having the greatest potential for impact, as well as water column temperature and density.

3.9.2.2.8 Injury and the Level A Harassment Zone

The remainder of the Level A harassment zone, which extends beyond the sub-region defining lethal exposures, encompasses all remaining non-lethal injuries that could potentially occur to marine mammals as a result of blast exposure. The criteria used to define the outer edge of the Level A harassment zone is the range at which PTS begins to occur (onset PTS). The auditory system consists of delicate tissues (e.g., hair cells) that are sensitive to pressure changes and responsive to sound exposures that are well below levels likely to cause trauma to non-auditory, air containing structures. PTS is non-recoverable and must result from the destruction of tissues within the auditory system (e.g., tympanic membrane rupture, disarticulation of the middle ear ossicles, and hair-cell damage).

Therefore, PTS qualifies as an injury and is classified as Level A harassment under the wording of the MMPA.

Onset PTS is indicative of the minimum level of injury that can occur due to sound exposure. All other forms of trauma would occur closer to the sound source than the range at which onset PTS occurs.

3.9.2.2.9 TTS and the Level B Harassment Zone

The Level A harassment zone extends from the detonation point outward to that point where the slightest injury may occur. Therefore, the Level B harassment zone begins just beyond the point at which the slightest amount of injury occurs and extends outward to the distance and exposure where the onset of TTS is expected to occur. Consistent with previous NMFS rulings, single, time-isolated impulsive events such as that described in this EIS are considered incapable of causing significant behavioral disruption at levels below those causing TTS. Because of the transient nature of the sources used in this action, the limited number of detonations, and temporal spacing of detonations, no significant behavioral effects that qualify as Level B harassment would occur in this action (NMFS 2009a, 2009b). As a result, only physiological effects need be considered in the development of harassment criteria. The Level B harassment zone only includes the region in which TTS is predicted to occur. TTS is recoverable and, as in recent rules (NMFS 2009a, 2009b), is considered to result from the temporary, non-injurious distortion of hearing-related tissues. In this EIS, the smallest measurable amount of TTS (onset TTS) is taken as the best indicator for slight temporary sensory impairment. The acoustic exposure associated with onset TTS is used to define the outer limit of the portion of the Level B harassment zone attributable to physiological effects. This follows from the concept that hearing loss potentially affects a marine mammal's ability to react normally to the sounds around it; it potentially disrupts normal behavior by preventing it from occurring. Therefore, the potential for TTS qualifies as a Level B harassment that is mediated by physiological effects upon the auditory system.

3.9.2.2.10 Level B Behavioral Effects

This EIS defines behavioral effects as variations in an animal's behavior that exceed the normal daily variation in behavior, do not meet the definition of a physiological effect, and which follow an anthropogenic sound exposure. Level B harassment includes only those acts which disturb or are likely to disturb by causing disruption of behavioral patterns to the point where those patterns are abandoned or significantly altered. Previous actions and rules (NMFS 2009a, 2009b, DoN 2008a, DoN 2008b) have concluded that a momentary behavioral reaction of an animal to a brief, time-isolated acoustic event does not qualify as Level B harassment. That Level B harassment occurs only when there is "a potential for a significant behavioral change or response in a biologically important behavior or activity" (NMFS, 2002). This conclusion is further supported by the National Defense Authorization Act of 2004 (Public Law [PL] 108-136) for actions involving military readiness, as defined in Section 11.

The short-duration events proposed for this action are brief and time-isolated. In this EIS and consistent with prior rules (e.g., NMFS 2009a, 2009b), they are considered incapable of causing behavioral effects beyond slight, momentary disruption and are unlikely to have any significant biological impact upon exposed animals. Furthermore, the transient nature of impulsive sources proposed for this action, the limited number of detonations required for the completion of the action, the temporal spacing of detonations (on the order of days), and the dynamic and patchy nature of offshore animal distributions makes it unlikely that any animal would be exposed to more than one acoustic event. These conclusions are considered as limiting factors in the development of harassment zones for this proposed action.

3.9.2.2.11 Auditory Masking

Natural and artificial sounds can disrupt behavior by masking, or interfering with an animal's ability to hear other sounds. Masking occurs when the receipt of a sound is interfered with by another coincident sound at similar frequencies and at similar or higher levels. If the second sound were man-made, it could be potentially harassing—according to the MMPA—if it disrupted hearing-related behavior such as communications or echolocation. It is important to distinguish TTS and PTS, which persist after the sound exposure, from masking, which occurs during the sound exposure. Because masking (without a resulting TS) is not associated with abnormal physiological function, it is not considered a physiological effect in this EIS, but rather a potential behavioral effect.

The most intense underwater sounds in the proposed action are those produced by detonations and pile driving. Given that the energy distribution of detonations and pile driving cover a broad frequency spectrum, sound from these sources would likely be within the audible range of most marine mammals. However, the time scale of the shots is very limited; the pulse lengths are short, the repetitions of the shots are few, and the total time per year during which detonations occur is small. The probability for any detonation or pile driving resulting from this proposed action masking acoustic signals important to the behavior and survival of marine mammal species is negligible. Additionally, for reasons outlined above, any masking event that did occur would be considered transient and insignificant and would not qualify as Level B harassment. Masking effects are not considered as contributing to exposure estimates in this EIS.

3.9.2.3 Criteria for Assessing Marine Mammal Response to Underwater Detonations

The effects of an at-sea explosion on a marine mammal depends on many factors, including the size, type, and depth of both the animal and the explosive charge; the depth of the water column; the standoff distance between the charge and the animal; and the sound propagation properties of the environment. Potential impacts can range from brief acoustic effects (such as behavioral disturbance), tactile perception, physical discomfort, slight injury of the internal organs and the auditory system, to death of the animal (Yelverton et al. 1973, O'Keeffe and Young 1984, DoN 2001). Non-lethal injury includes slight injury to internal organs and the auditory system; however, delayed lethality can be a result of individual or cumulative sublethal injuries (DoN 2001a). Short-term or immediate lethal injury would

result from massive combined trauma to internal organs as a direct result of proximity to the point of detonation (DoN 2001a).

In this EIS, several standard acoustic metrics (Urick 1983) are used to describe the thresholds for predicting potential physical impacts from underwater pressure waves:

- Total energy flux density or Sound Exposure Level (SEL). For plane waves (as assumed here), SEL is the time integral of the instantaneous intensity, where the instantaneous intensity is defined as the squared pressure divided by the impedance of sea water. Thus, SEL is the instantaneous pressure amplitude squared, summed over the duration of the signal and has dB units referenced to 1 micropascal squared second (μPa^2-s).
- 1/3-octave SEL. This is the SEL in a 1/3-octave frequency band. A 1/3-octave band has upper and lower frequency limits with a ratio of 21:3, creating bandwidth limits of about 23 percent of center frequency.
- Positive impulse. This is the time integral of the initial positive pressure pulse of an explosion or explosive-like wave form. Standard units are Pascal seconds (Pa-sec), but pounds per square inch milliseconds (psi-ms) also are used.
- Peak pressure. This is the maximum positive amplitude of a pressure wave, dependent on charge mass and range. Units used here are psi, but other units of pressure, such as μPa and Bar, also are used.

This section summarizes the marine mammal impact criteria used for the subsequent modeled calculations. The following terminology is used in this section:

- Criterion, Specific impact that could be used to represent a broad type of impacts (mortality, injury, harassment). For example, onset of severe lung injury (extensive lung hemorrhage) is used in this EIS as a criterion for the onset of mortality.
- Threshold. The specific level of sound pressure, impulse, or energy needed to cause the specific impact stated in a criterion.
- Range. The maximum horizontal distance from the detonation point where the threshold level is predicted to occur.

To assess the effects of underwater explosions at SSTC, two types of criteria are necessary, those for mortality injury (i.e. Level A harassment) and those for non-injurious physiological and/or behavioral disruption (i.e. Level B harassment). The SSTC criteria are based on those numeric criteria as specified by NMFS in recent NMFS rule making (NMFS 2009a, 2009b), which involved a single, underwater detonations isolated in time. These criteria are presented in Table 3.9-2.

3.9.2.3.1 Harassment Threshold for Sequential Detonations

There may be rare occasions when sequential underwater detonations are part of a static location event. For sequential detonations, accumulated energy over the entire training time is the natural extension for energy thresholds since energy accumulates with each subsequent shot.

For sequential detonations, the acoustic criterion for behavioral harassment is used to account for behavioral effects significant enough to be judged as harassment, but occurring at lower sound energy levels than those that may cause TTS. The behavioral harassment threshold is based on recent rulemaking from NMFS (NMFS 2009a, 2009b) for the energy-based TTS threshold.

The research on pure tone exposures reported in Schlundt et al. (2000) and Finneran and Schlundt (2004) provided the pure-tone threshold of 192 dB as the lowest TTS value. This value is modified for

explosives by (a) interpreting it as an energy metric, (b) reducing it by 10 dB to account for the time constant of the mammal ear, and (c) measuring the energy in 1/3 octave bands, the natural filter band of the ear. The resulting TTS threshold for explosives is 182 dB re 1 mPa^2-s in any 1/3 octave band. As reported by Schlundt et al. (2000) and Finneran and Schlundt (2004), instances of altered behavior in the pure tone research began 5 dB lower than those causing TTS. The behavioral harassment threshold is derived by subtracting 5 dB from the 182 dB re 1 mPa^2-s in any 1/3 octave band threshold, resulting in a 177 dB re 1 μPa^2-s behavioral disturbance harassment threshold for multiple successive explosives.

Table 3.9-2: Marine Mammal Effects Criteria For Underwater Detonations From Explosives < 2,000 lbs Net Explosive Weight

	Criterion	Criterion Definition	Threshold	Comments
Mortality	**Mortality** Onset of extensive lung injury	**Shock Wave** Goertner's modified positive impulse, indexed to the surface	I = 42.9 (M/34)1/3 psi-msec *calculated to be* 30.5 psi-msec	For all size classes of marine mammals
Level A Harassment	**Slight Injury** Onset of slight lung injury	**Shock Wave** Goertner's modified positive impulse, indexed to the surface	I = 19.7 (M/42)1/3 psi-msec *calculated to be* 13 psi-msec	For all size classes of marine mammals
	Slight Injury 50% tympanic membrane rupture	**Shock Wave** Total SEL, for any single exposure	205 dB re:1μPa^2-sec	All marine mammals
Level B Harassment	**Physiological Disruption** TTS	**Sound Exposure** Greatest SEL in any 1/3-octave band, over all exposures	182 dB re1μPa^2-sec	Greatest SEL for frequencies ≥ 100 Hz for odontocetes and ≥ 10 Hz for mysticetes
	Physiological Disruption TTS	**Sound Exposure** Peak pressure, for any single exposure	23 psi	All marine mammals
	Behavioral Disruption Non-TTS	**Sound Exposure** Greatest SEL in any 1/3-octave band, over all exposures	177 dB re:1μPa^2-sec	Greatest SEL for frequencies ≥ 100 Hz for odontocetes and ≥ 10 Hz for mysticetes

3.9.2.4 Acoustic Modeling of the Marine Environment

In context of ocean sounds within and adjacent to the SSTC, anticipated ocean noise can be characterized as either:

1) Ambient noise as a combination of natural noise from breaking waves, spray, bubble formation and collapse, molecular thermal agitation, rainfall, and biologics (fish sounds, snapping shrimp sounds, marine mammal vocalizations, etc.), and often indistinct anthropogenic (human made) noise from passing vessels, small powered boats, aircraft overflights, etc.

2) Point source anthropogenic noise produced by a single, identifiable source usually close to the point of reference (e.g., an underwater explosion at SSTC, temporary pile driving).

3.9.2.4.1 Multiple Indistinguishable Sources: Ambient Noise

More detailed discussions on ambient ocean noise are provided in Richardson et al. 1995, Deane 1997, 2000, NRC 2003, Hildebrand 2005 , Hildebrand 2009, which list specific case studies highlighting the sources and frequency content of natural and anthropogenic ocean noise sources. With the exception of sonar, many of these sources are applicable and contribute to ambient noise within the SSTC. Surf noise, biological noise, large vessel and small boat traffic, and aircraft overflights are likely to be the most dominant ambient noise sources within SSTC (Richardson et al. 1995, Deane 1997, Deane 2000, Hildebrand 2009).

Wenz (1962) provided a generalized portrait of ocean noise used to predict, model, and understand the noise level from unidentifiable sources. These curves provide a noise spectrum level (units are dB re $1\mu Pa^2/Hz$) that an idealized receiver with omni-directional reception capabilities may experience at a particular moment depending on location. Although ambient noise is always present, the individual sources that contribute to it do not necessarily create sound continuously. For example, rain is periodic, and wind speeds change with weather patterns. Seasonal trends are likely related to changes in average wind speeds with season (McDonald et al. 2006). Given the near shore distribution of the training areas within the SSTC, surf zone noise (breaking waves, etc.) is likely to be a constant ambient noise source. In the northern hemisphere, ambient noise in deep water can be dominated by shipping, particularly at frequencies between 5 and 500 Hz (Richardson et al. 1995, NRC 2003, Hildebrand 2009). By most estimates, there has been an increase of underwater noise associated with increased commercial shipping traffic, especially in areas near major ports. Several studies have documented an approximate equivalent 3 dB per decade increase in ocean noise attributed to commercial shipping (Hildebrand 2005, McDonald et al. 2006, Hildebrand 2009). In terms of logarithmic scaling used in sound measurements, this 3 dB increase is equivalent to a doubling of noise energy levels every 10 years over the last few decades.

Distant and localized shipping traffic approaching San Diego Bay can contribute to the general acoustic environment over a wide frequency range and large geographic area. However, it should be noted that shallow water noise levels from shipping traffic are highly variable primarily because of differences in local acoustic propagation and seafloor absorption characteristics in shallow water vice deep water (MacDonald et al. 2009). While the distribution and timing of shipping traffic is not uniform, this type of ambient ocean noise is prevalent in and around major ports including San Diego (Heitmeyer et al. 2004).

3.9.2.4.2 Single Discrete Sources: Underwater Explosions

Chemical explosives create a bubble of expanding gases as the material burns. The bubble can oscillate underwater or, depending on charge-size and depth, be vented to the surface in which case there is no bubble-oscillation with its associated low-frequency energy. Explosions produce very brief broadband pulses with rapid rise-time, high zero-to-peak pressures, and intense noise for an “instant” of time, sometimes described as impulse. To evaluate the nature of possible exposure-response relationships, criteria were developed by the U.S. Navy specifically for underwater explosions.

The impacts of an underwater explosion to a marine mammal are dependent upon multiple factors including the size, type, and depth of both the animal and the explosive. Depth of the water column and the distance from the charge to the animal also are determining factors as are boundary conditions that influence reflections and refraction of energy radiated from the source. Potential impacts can range from brief acoustic effects, tactile perception, and physical discomfort to both lethal and non-lethal injuries. Disturbance of ongoing behaviors could occur as a result of noninjurious physiological responses to both the acoustic signature and shock wave from the underwater explosion. Nonlethal injury includes slight injury to internal organs and auditory system.

The severity of physiological effects decreases with decreasing sound exposure and/or increasing distance from the sound source. Injuries to internal organs and the auditory system from shock waves and intense impulsive noise associated with explosions can be exacerbated by strong bottom-reflected pressure pulses in reverberant environments (Gaspin 1983, Ahroon et al. 1996). The same generalization applies to behavioral effects, but is complicated by the fact that behavioral responses also depend on an animal's learned responses, innate response tendencies, motivational state, pattern of the sound exposure, and the context in which the sound is presented. The relationship between severity of effects, source distance, and exposure level, as defined in this evaluation, was depicted previously in Figure 3-10.1.

Behavioral responses to exposure from at-sea explosions can range from no observable response to panic, flight and possibly more significant responses as discussed previously (Southall et al. 2007, NOAA 2009). It has been long recognized that the intensity of the behavioral responses exhibited by marine mammals depends on a number of conditions including the age, reproductive condition, experience, behavior (foraging or reproductive), species, received sound level, type of sound (impulse or continuous) and duration of sound (Reviews by Richardson et al. 1995, Wartzok et al. 2003, Cox et al. 2006, Nowacek et al. 2007, Southall et al. 2007). Many behavioral responses may be short term (seconds to minutes) and of little immediate consequence for the animal such as simply orienting to the sound source. Alternatively, there may be a longer term response over several hours such as moving away from the sound source. In addition, some responses have the potential life function consequences such as leading to a stranding or a mother-offspring separation (Baraff and Weinrich 1994, Gabriele et al. 2001). The louder the sound source the more intense the response although duration, context, and disposition of the animal are also very important (Southall et al. 2007). According to the severity scale response spectrum proposed by Southall et al. (2007), responses classified as from 0-3 are brief and minor, those from 4-6 have a higher potential to affect foraging, reproduction, or survival and those from 7-9 are likely to affect foraging, reproduction and survival. Sonar and explosive mitigation measures (sonar power-down or shut-down zones and explosive exclusion zones) would likely prevent animals from being exposed to the loudest sonar sounds or explosive effects that could potentially result in TTS or PTS and more intense behavioral reactions on the response spectrum.

While there are little data on the consequences of sound exposure from underwater detonations on vital rates of marine mammals, exposure to sounds resulting from Navy underwater explosive training would be brief as each event is discrete and separate in time and space from other similar events. In addition, the overall size of the explosives used at the SSTC is much smaller that those used during larger Fleet ship and aircraft training events.

Predictive software incorporates specific bathymetric and oceanographic data to create accurate sound field models for each source type. Oceanographic data such as the sound velocity profiles, bathymetry, and seafloor properties directly affect the outcome of an ocean acoustic propagation model. Depending on location, seasonal variations, and the oceanic current flow, dynamic oceanographic attributes such as the sound velocity profile (SVP), i.e., the differences in sound velocity at different depths, can change dramatically.

For predicting sound and pressure fields at SSTC, underwater explosions were simulated using the Reflection and Refraction in Multilayered Ocean/Ocean Bottoms with Shear Wave Effects (REFMS) model. Spreading (losses) of the SEL, 1/3-octave bands of SEL, maximum positive impulse, and peak pressures for each device and Alternative were modeled. The prediction of sound and pressure fields at SSTC for underwater explosions in VSW is addressed in Section 3.9.2.3.3

The training at SSTC takes place in a shallow-water environment where propagation of shock waves and sound energy are constrained by boundary conditions at the surface and sea floor (Figure 3-10.2). A hypothetical source is shown below the sea surface and above the seabed, indicating how energy from the

explosion reaches a sub-surface receiver via multiple paths. An iso-speed water column was used for illustrative purposes, indicating no refraction of paths from changes in sound speed.

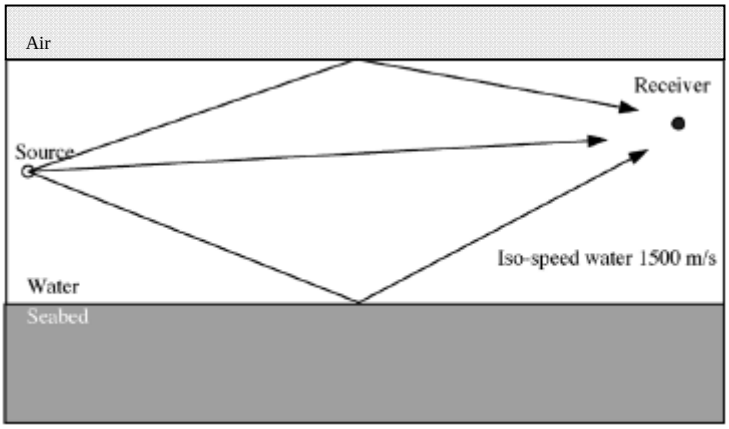

Figure 3.9-2: Generalized Pathways of Shock Waves and Sound Energy
(Adapted from Siderius and Porter 2006).

Determining the ZOI for the thresholds in terms of total SEL, impulse, peak pressure and 1/3-octave bands SEL must treat the sequential explosions differently than the single detonations. Two factors are involved for the sequential explosives that deal with the spatial and temporal distribution of the detonations as well as the effective accumulation of the resultant acoustics. In view of the ZOI determinations, the sequential detonations are modeled as a single point event with only the SEL summed coherently. These accumulations are coherent because no time or space changes occur between successive explosions as well as no mammal movement. More specifically, the ZOIs of peak pressure and impulse for the Marine Mammal Systems, Dive Platoon, Qual/Cert, Mine Neutral and unmanned underwater vehicles (UUV) Neutral activities were all evaluated as single events whereas the SELs were summed coherently as $10*\log10(n^2p^2)$ where n is the number of equal sequential charges and p is the sound pressure per charge. Note that each value of the resultant sound exposure level is scaled by the reference units $1\mu Pa^2$-s.

SVP of all twelve months were acquired from the Naval Oceanographic Office (NAVOCEANO) web site for the SSTC site. Unfortunately, these profiles do not lie within the SSTC ROI. The closest SVP point record is approximately five miles west (seaside) of area SSTC-N, which has a much deeper water column and different sound velocities. However, local and much shallower measurements of the sound velocity (SV) were acquired from the underwater explosive tests conducted near the Naval Amphibious Base. Although these SV measurements are even shallower than those required for the SSTC water depths, the most significant observation is the overall lower SV levels compared to those from the NAVOCEANO website. The latter levels were approximately and nearly uniformly 100 feet per second higher (approximately two percent) than the former measurements.

To reconcile this discrepancy, several sensitively tests were performed to quantify the relative influence of the SV levels on the final ZOI determinations as well as the mammal exposures via the same governing predicted acoustic characteristics. Essentially, a two percent increase in SV gave statistically the same change (two percent) in ZOI, which was not threshold independent due to the differences in SV from month to month. Given this low percentage, the REFMS model was modified to allow uniform adjustments in the SVP and density of the water column. This adjustment was applied to all NAVOCEANO profiles (one for each month).

After adjusting each SVP, the corresponding ZOIs were computed by the modified REFMS model and tabulated for each given threshold. To report representative values for both the warm and cold seasons, mean and standard deviation statistics were calculated using the tabulated May-October and November-April results, respectively.

For the present determination of ZOIs for each threshold, improvements were made to the REFMS tool to allow multiple two-dimensional (depth/range) computational points concurrently. In the simulations that involved deep waters concurrent with deep charge depths, the lung injury is treated differently when choosing these discrete points. This treatment is necessary to concentrate points near the surface when applying Goertner's (1982) model for lung injury. But for the SSTC site where the water depths are 72 feet or less, the selected discrete computational points of depth and range were consistent for all thresholds (Table 3.9-3).

Table 3.9-3: Selected Discrete Computational Points of Depth and Range

Depth (feet)	Range (nm)
1.64	0.0043
3.28	0.0087
6.56	0.0148
9.84	0.027
16.4	0.0415
24.3	0.688
30.0	0.1
40.0	0.2
56.0	0.3
72.0	0.4

where depth points greater than 24 feet were adjusted to accommodate the particular water depth. This two-dimensional (range and depth) distribution gave more than 60 discrete points of REFMS results for evaluating the ZOIs of each threshold based on peak positive impulse (psi-ms), peak pressure (psi) and SEL in 1/3-octave bands (dB re: 1 μPa^2-s) and total SEL (dB re: 1 μPa^2-s).

3.9.2.4.3 Very Shallow Water Underwater Detonations

Measurements of pressure-wave propagation are available for detonations in deep and shallow water, but only fragmentary data exist for propagation in VSW near shorelines between the shoreline and 24 foot depth. The lack of data is due to the complicated nature of the VSW environment as well as to substantial differences between different VSW sites. In VSW, surface- and bottom-boundary effects have more influence on propagation than in deeper water. At the point of detonation, the geometry of the short water column dictates that a charge must be close to one or both of these boundaries. More likely surface blowout can dissipate energy and diminish bubble formation with its attendant oscillation effects while detonations closer to the bottom may have considerable energy absorbed by the bottom as well. Further, as pressure waves propagate laterally through the VSW column, they reflect off surface and bottom boundaries more often over a given distance than in deeper waters and VSW boundaries exert their influence more frequently over that distance. Refraction of the pressure waves, determined by the SVP, acts as it does in deeper water, but thermal layering and mixing of layers that determine the SVP may be more complicated and dynamic in VSW. In summary, reliable prediction of pressure wave propagation in all situations requires knowledge of the charge size, type, and position as well as boundary and water column conditions, but in VSW, the relative contributions of these variables may differ considerably from those in deeper waters.

The best mathematical models of underwater explosive-pressure propagation take into account the variables just described. However, the lack of empirical validation data for VSW has resulted in the use of less complete models with untested assumptions as well as more complete models with untested assumptions and extreme values of those variables. Occasionally, these practices produced extreme over- and underestimation of propagation and consequent effects on marine mammals, neither of which facilitate realistic, practical regulatory compliance policy. To address the variables of concern and garner an understanding of the effects of underwater detonations, the Navy collected and analyzed empirical data from underwater detonations conducted during training events. Because bottom conditions factor heavily into the amount of energy propagating through the water column, explosive tests were conducted at actual ordnance training sites so that, in addition to providing basic data to test theoretical issues, the tests would also provide applied knowledge about the acoustic properties of specific beach approaches in which explosive training and tests are conducted.

Measurements of the propagated pressures in live-fire tests during single-charge exercises at SSTC were conducted in 2002 and 2003 as part of a study to evaluate underwater explosive propagation models in VSW (NSWC/Anteon Corp., Inc. 2005). Relevant results and conclusions are described in this EIS and details of the procedures, results, and conclusions may be found in the NSWC report. The measurements made in those tests provided an in-place characterization of pressure propagation for the training exercises as they are actually conducted at the SSTC. As the empirical measurements closely matched conservative model predictions, those model predictions were used to establish mitigation ranges for explosive exercises in VSW of 25 feet depth or less at the SSTC.

During the tests, 2 and 15 pound charges of C4 explosives were detonated in 15 feet of water with charges laying on the bottom or two feet off the bottom at SSTC. Peak-pressures (unfiltered) and energies – between 100 Hz and 41 kHz - in 1/3-octave bands of highest energies from each detonation were measured in three locations relative to the charges: 1) within feet of the charge to measure the actual output of each blast and bottom reflection, 2) 250 feet seaward, and 3) at about 1000 feet seaward. The small 2 pound charges at SSTC were measured only within feet of the charge or at a range of 525 feet from the charge.

In the tests, the position of single charges - on and 2 feet off the bottom – affected the propagated peak-pressures. Off-bottom charges produced consistently greater peak-pressures than on-bottom charges as measured at about 200, 500, and 1000 ft distances. Off-bottom 15 pound charges in 15 feet of water produced between 43 – 67 percent greater peak-pressures than on-bottom charges (NSWC/Anteon Corp. Inc. 2005). The exercises in the Proposed Action for SSTC use on-bottom placement for charges up to 29 pounds of C4, while off-bottom charges are limited to 3.6 pounds or less of C4 or equivalent.

Additionally, the data from VSW at the SSTC sites are suggestive of a trend that is not seen in explosions occurring in deeper water where charges are located in the upper portion of the water column. For most of the single charge detonations, measuring gages located at greater distance and depth in the water column showed lower peak-pressures and energies whereas, , the highest pressures and energies are measured at the deepest depths due to reflection and refraction of pressure waves. While suggestive, the findings are not conclusive in that the deepest gages did not extend all the way down to the bottom and no general conclusion could be drawn (NSWC/Anteon Corp. Inc. 2005).

Measurements during single-charge exercises produced empirical data that were predicted by the propagation models. At about 1000 feet seaward, peak-pressure varied from 11-17 pounds per square inch (psi) at different depths, and energies between 100 Hz and 41 kHz in the 1/3-octave bands of highest energies varied from about 175-186 dB re 1 $\mu Pa^2 \cdot sec$ at different depths. From the measurements, it was determined that the range at which the dual criteria for onset-TTS would be expected to occur in small odontocetes matched the range predicted by a conservative model of propagation that assumed a boundary-less medium and equal sound velocity at all depths in the range – i. e., an “iso-velocity” model.

Based on the empirical propagation data and iso-velocity model predictions, the mitigation range for physiological disruption (TTS) for exercises with charge-weights of 20 pounds or less of C4 on the bottom and for charge-weights of 3.6 pounds or less off the bottom at SSTC is determined to be a 1,300 ft radius out from the site of the detonation with the shoreward half of the implied circle being truncated by the shoreline and extremely shallow water immediately off shore.

Predictions made by the REFMS model were found to be unstable across the distances considered under the conditions of VSW with bottom or near bottom charge placement, reflective bottom, and a non-refractive water column – i. e., equal sound velocity at all depths (NSWC/Anteon Corp. Inc., 2005). The source of instability in the REFMS predictions is most likely due to the nature of VSW wherein the ratio of depth to range is very small – a known problem for the REFMS predictive ray-tracing. Reflective and placement conditions within the model may contribute as well. REFMS was developed for large explosives in deep water and has been validated there, but overestimates sound propagation in VSW, and overestimates exposures to marine mammals that might occur in VSW. As mentioned, the peak-pressures and 1/3-octave band energies for the VSW bottom at SSTC were just as well predicted by the simpler iso-velocity model. In iso-velocity conditions, peak pressure follows a power law over distance as do the dominant frequency and energy at that frequency. Predictions of the iso-velocity model for detonations in an unbounded (equivalent to off-bottom), homogeneous medium (a free acoustic field) appear in Figure 3.9-3.

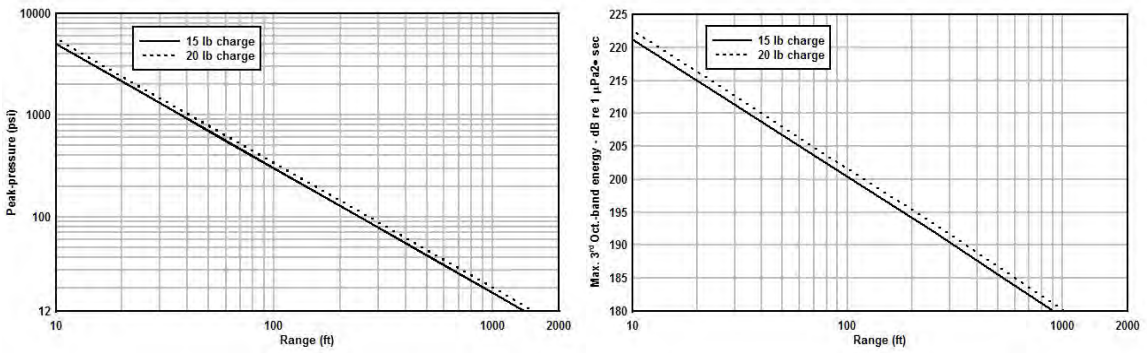

Figure 3.9-3: Iso-velocity Predictions of Peak Pressure and Energy in the 1/3-Octave-band of Highest Energy Above 100Hz as a Function of Range for 15- and 20-pound Charges of C4 Explosive

3.9.2.5 Estimating Marine Mammal Exposures to Underwater Detonations

The methodology for analyzing potential impacts from explosives is presented in Section 3.9.2.3, which explains the model process, describes how the impact threshold resulting from Navy-NMFS consultations are derived, and discusses relative potential impact based on species biology.

The Navy acoustic exposure model process uses REFMS to assess potential exposure of marine mammals to explosions. Results are based upon extensive precomputations over the range of acoustic environments that might be encountered in the operating area. REFMS was used to estimate marine mammal exposures in both shallow water (24 to 72 feet) and VSW (zero to 24 feet). While REFMS may not be as precise as the iso-velocity model in VSW, it overestimates the exposures that might occur and provides a conservative estimate of exposures.

The acoustic model includes four steps used to calculate potential exposures:

1. Identify unique acoustic environments that encompass the operating area. Parameters include depth and seafloor geography, bottom characteristics and sediment type, wind and surface roughness, sound velocity profile, surface duct, sound channel, and convergence zones.
2. Compute transmission loss (TL) data appropriate for each sensor type in each of these acoustic environments. Propagation can be complex, depending on a number of environmental parameters listed in step one, as well the amount of explosive material detonated.
3. Use that TL to estimate the total sound energy received at each point in the acoustic environment.
4. Apply this energy to predicted animal density for that area to estimate potential acoustic exposure.

The exposures predicted from modeling rely on many factors but are influenced greatly by assumptions, methods, and criteria used. The following list is not exhaustive but reveals several features of the technical approach that influence exposure prediction. Assumptions, caveats, and limitations are grouped below by topic. However, to put these exposures in context, the following caveats are listed below:

1. Significant scientific uncertainties are implied and carried forward in any analysis using marine mammal density data as a predictor for animal occurrence within a given geographic are.
2. There are limitations to the actual model process based on information available (animal densities, animal depth distributions, animal motion data, impact thresholds, and supporting statistical models).

3.9.2.5.1 Model Assumptions

- The tempo of training activities was divided evenly throughout the year with two oceanographic season, defined as warm and cold at this location, each having ½ total events for simulated purposes.
- No two training activities occur the same day.
- Each training activity was treated as an isolated event.
- The minimum time separation was used when time between blasts were controlled; however, actual temporal relationships between explosions can be longer depending on conditions (set-up, weather, etc.).
- The numbers of individual training activities shown in Tables 3.7-9 and 3.7-10 represent range schedule maximums with range operation time fully booked.

3.9.2.5.2 Biological Data Assumptions

Marine mammal occurrence within any geographic area including southern California is highly variable, and many cetacean species respond to oceanographic variability by changing their distribution rather than exhibiting changes in survival and reproductive success (Forney 2000, Ferguson and Barlow 2001, Benson et al. 2002, Tynan 2005, Redfern 2006). For some species, distribution may be highly influenced by small scale features over both short and long-term time scales (Ballance et al. 2006, Etnoyer et al. 2006, Ferguson et al. 2006, Skov et al. 2007). Unfortunately, the understanding of the ecological processes determining marine mammal distributions at some large scale and most small scale processes is incomplete.

Given the uncertainties in marine mammal density estimation and localized distributions, the U.S. Navy's acoustic impact models cannot currently be used to predict the occurrence of marine mammals within specific regions of southern California. To resolve this issue and allow modeling to proceed, animals are assumed to be uniformly distributed within the SSTC. This process does not account for animals that move into or out of the region based on foraging and migratory patterns, and adds a significant amount of variability to the model predictions.

- Mean animal densities were used during exposure calculations and took into account the worst-case water depth, animal depth, and sound speed profile.
- Density estimates were derived from marine mammal survey data gathered elsewhere in the southern California in water depths of less than 1000 meters, which may over-estimate actual localized densities within the shallow waters of SSTC.
- Animal travel (i.e. movement) taken into account for activities with multiple or sequential explosions (requiring the summation of received energy).
- Animal movement within the virtual SSTC environment was two-dimensional (2D) in nature and did not take into account depth as a dimension; therefore, animals were assumed to be in the water column where the effect of the explosions was greatest.

3.9.2.5.3 Criteria Assumptions

The quantitative exposure modeling methodology produces numbers of individuals exposed to the effects of underwater explosions exceeding the thresholds used. All estimated exposures are seasonal averages (mean) plus one standard deviation (σ) using one-half of the yearly training tempo. This provides a conservative approach to estimating exposures typical of training during a single year. Mitigation methods were not quantified and implementation is not reflected in exposure estimates. Results from acoustic impact exposure models should be regarded as exceedingly conservative estimates that are strongly influenced by limited biological data. While the numbers generated from these models provide predictions of marine mammal exposures for consultation with NMFS, the short duration and limited geographic extent of explosive events does not necessarily mean that these exposures will ever be realized.

3.9.2.5.4 Model Results Explanation

Acoustic exposures are evaluated based on their potential direct effects on marine mammals, and these effects are then assessed in the context of the species biology and ecology to determine if there is a mode of action that may result in the acoustic exposure warranting consideration as a harassment level effect.

A large body of research on terrestrial animal and human response to airborne sound exists, but results from those studies are not readily extendible to the development of behavioral criteria and thresholds for marine mammals. For example, “annoyance” is one of several criteria used to define impact to humans from exposure to industrial sound sources. Comparable criteria cannot be developed for marine mammals because there is no scientifically acceptable method for determining whether a nonverbal animal is annoyed (NRC 2003). Further, differences in hearing thresholds, dynamic range of the ear, and the typical exposure patterns of interest (e.g., human data tend to focus on eight hour-long exposures) make extrapolation of human sound exposure standards inappropriate. At the present time there is no general scientifically accepted consensus on how to account for behavioral effects on marine mammals exposed to anthropogenic sounds including explosions (NRC 2003, NRC 2005). NRC (2005) acknowledges “there is not one case in which data can be integrated into models to demonstrate that noise is causing adverse affects on a marine mammal population.”

3.9.2.6 Estimating Marine Mammal Exposures from Pile Driving Activites

Noise associated with ELCAS installation activities includes a loud impulsive sound derived from driving piles into the soft sandy substrate of the SSTC waters to temporarily support a causeway of linked pontoons. Two hammer-based methods will be used to install/remove ELCAS piles: impact pile driving for installation and vibratory driving for removal. The impact hammer is a large metal ram attached to a crane. A vertical support holds the pile in place and the ram is dropped or forced downward. The energy is then transferred to the pile which is driven into the seabed. The ram is lifted by a diesel power source.

At the end of the training, a vibratory hammer attached to the pile head will be used to remove piles by applying a rapidly alternating force to the pile by rotating eccentric weights about shafts, resulting in an upward vibratory force on the pile. The vertical vibration in the pile disturbs or "liquefies" the sediment next to the pile causing the sediment particles to lose their frictional grip on the pile.

Since 1997, NMFS has been using generic sound exposure thresholds to determine when an activity in the ocean that produces impact sound (i.e., pile driving) result in potential take of marine mammals by harassment (70 CFR 1871). NMFS is developing new science-based thresholds to improve and replace the current generic exposure level thresholds, but the criteria have not been finalized (Southall et al. 2007). Current NMFS criteria (70 FR 1871) regarding exposure of marine mammals to underwater impulsive sounds (e.g., impact pile driving) is that cetaceans exposed to sound levels of 180 dB root mean squared (RMS in units of dB re 1 µPa) or higher and pinnipeds exposed to 190 dB RMS or higher are considered to have been taken by Level A (i.e., injurious) harassment. Marine mammals (cetaceans and pinnipeds) exposed to impulse sounds of 160 dB RMS but below injurious thresholds (i.e, 180 or 190 dB) are considered to have been taken by Level B behavioral harassment. Marine mammals (cetaceans and pinnipeds) exposed to continuous noise of 120 dB RMS (e.g., vibratory pile driving) or above are considered to have been taken by Level B behavioral harrassment.

The methodology for analyzing potential impacts from ELCAS activities is similar to that of analyzing explosives, which is presented in Section 3.9.2.5. The ELCAS analysis includes two steps used to calculate potential exposures:

1. Estimate the zone of influence for Level A injurious and Level B behavioral exposures for both impact pile driving and vibratory pile removal using the practical spreading loss model.
2. Estimate the number of species exposed using species density estimates (Table 3.9-1) and estimated zones of influence.

The practical spreading loss model is used to estimate the attenuation of underwater sound over distance. NOAA and USFWS have accepted the use of the practical spreading loss model to estimate transmission loss of sound through water for past pile driving calculations (California Department of Transportation [CADOT] 2009). The formula for this propagation loss can be expressed as:

$$TL = F * \log (D1/D2)$$

Where:

TL = transmission loss (the sound pressure level at D1 minus the sound pressure level at D2, in RMS, dB re 1µPa)

F = attenuation constant

D1 = distance at which the targeted transmission loss occurs

D2 = distance from which the transmission loss is calculated

The attenuation constant (F) is site-specific factor based on several conditions, including water depth, pile type, pile length, substrate type, and other factors. Measurements conducted by the CADOT and other consultants (Greeneridge Science) indicate that the attenuation constant (F) can vary from 5 to 30. For pile driving sounds that are higher frequency (e.g., smaller-diameter steel piles), the transmission loss can be higher than losses associated with piles that predominantly produce lower frequencies (e.g., larger diameter piles). Small-diameter steel H-type piles have been found to have high F values in the range of 20 to 30 near the pile (i.e., between 10 and 20 meters) (CADOT 2009). In the absence of empirically measured values at SSTC, the F value for SSTC is assumed to be on the low (conservative) end of the small-diameter steel piles (F=20).

The exposures predicted from ELCAS assessment rely on many factors but are influenced greatly by assumptions, methods, and criteria used. The following list of assumptions, caveats, and limitations is not exhaustive but reveals several features of the technical approach that influence exposure prediction:

1. Significant scientific uncertainties are implied and carried forward in any analysis using marine mammal density data as a predictor for animal occurrence within a given geographic area.
2. The assessment conservatively assumed that all ELCAS training would occur along the oceanside of SSTC. In actuality, they are also conducted in the Bravo Beach training area on the Bayside of SSTC-N. Marine mammals are rarely encountered within this southern portion of San Diego Bay, and given this lack of occurrence, exposures to marine mammals during ELCAS training in the Bay is not expected. By assuming that all ELCAS training would occur on the oceanside of SSTC-N, exposure estimates may overrepresent actual potential exposures. For example, the estimates may be double of what they might actually be if half of the ELCAS training was to occur on the Bayside.
3. Marine mammal are assumed to be uniformly distributed within the ocean waters adjacent SSTC.
4. The tempo of training activities was divided evenly throughout the year with two oceanographic seasons, defined as warm and cold at this location, each having ½ total events for simulated purposes.
5. There are data limitations. Some of the data supporting the analysis was derived from other projects with different environmental and project conditions (animal densities, pile driving source levels, and transmission loss parameters).

The ELCAS exposure assessment methodology is an estimate of the numbers of individuals exposed to the effects of ELCAS activities exceeding NMFS established thresholds. Of significant note in these exposure estimates, mitigation methods were not quantified within the assessment and successful implementation of mitigation is not reflected in exposure estimates. Results from acoustic impact exposure assessments should be regarded as conservative estimates that are strongly influenced by limited biological data. While the numbers generated from the ELCAS exposure calculations provide conservative overestimates of marine mammal exposures for consultation with NMFS, the short duration and limited geographic extent of ELCAS training would further limit actual exposures.

3.9.2.7 Other Effects Considered

There is the potential for non-auditory impacts on marine mammals from direct physical injury from underwater detonations or collisions with vessels. The use of currently implemented monitoring and marine mammal safety zones (as defined in the next section) during mine detonation activities can prevent such impacts on marine mammals. Vessel operators avoid surface obstructions during transit and combined with low transit speeds, minimize the potential of collision with a marine mammal.

3.9.2.8 No Action Alternative

3.9.2.8.1 Underwater Detonations

Small explosives, up to 20 pounds, will be used as part of exercises to neutralize simulated mines as well as qualification/certification training. Under the No Action Alternative and presented in Section 3.8.2.2.3 (Table 3.8-11), the exercises are conducted up to 103 times a year in the offshore boat lanes at SSTC. As indicated in Section 3.4, Hazardous Materials and Waste (Table 3.4-3), the major byproducts of these detonations are nitrogen, carbon dioxide, water, and carbon monoxide. Only trace amounts of organic compounds would be left following an underwater detonation of explosives. At such concentrations, these substances would not affect water quality and would have no direct effect on marine mammals.

Severity of an effect often is related to the distance between the sound source and a marine mammal and is influenced by source characteristics (Richardson and Malme 1995). For SSTC, zones of exposure were estimated for the different charge weights, charge depths, water depths, and seasons. These ZOI calculated ranges are shown in Table 3.9-4. For single detonations, the ZOI were calculated using the range associated with onset TTS while for those events with multiple charges the calculation was based on the non-TTS behavior disruption. Calculating the zones of influence in terms of total SEL, 1/3-octave bands SEL, impulse, and peak pressure for sequential (10 sec timed) and sequential detonations (> 30 minutes) were slightly different than the single detonations. For the sequential explosives, ZOI calculations considered spatial and temporal distribution of the detonations, as well as the effective accumulation of the resultant acoustic energy. To calculate the ZOI, sequential detonations were modeled such that explosion SEL were summed incoherently to predict zones while peak pressure was not.

Based on the modeling approach applied, as discussed in Section 3.9.2.4, and without consideration of current mitigation measures, activities under the No Action Alternative injury (Level A harassment) to marine mammals is not anticipated. However, underwater detonation activities could result in non-injurious (Level B) harassment to cetaceans and pinnipeds. For evaluation of TTS, a dual criteria is used, allowing one value to be presented as a TTS exposure level. This TTS dual criterion reduces the TTS to a single exposure level where the maximum truncated value is picked under the SEL (182 dB) or peak pressure (23 psi) column. Specifically, 78 annual exposures to pressure from underwater detonations could result in TTS (Level B harassment, Table 3.9-5). Of these 78 annual exposures, 52 exposures could result in TTS for bottlenose dolphins and 26 exposures could result in TTS for California sea lions due to pressures from underwater detonations. Exposures for harbor seals and gray whales are not anticipated due to low species density and the limited zone of influence of the underwater detonations. As mentioned previously, these exposure modeling results are estimates of marine mammal underwater detonation sound exposures without consideration of standard mitigation and monitoring procedures. Table 3.9-5 summarizes the species exposure levels for all detonations over an entire year in the SSTC ROI.

In addition to possible exposures that could result in TTS, modeling indicates that the No Action Alternative could also result in the potential for 68 non-physiological behavioral exposures. While physiological impacts were predicted for all activities, non-physiological behavioral impacts were predicted only for those exercises which involved multiple detonations during a training scenario. Coastal bottlenose dolphins were predicted to have a similar number of non-physiological behavioral exposures in both the warm (16) and cold (24) seasons, while California sea lions were predicted to have a higher number of non-physiological behavioral exposures during the cold season (24) than in the warm season (4).

Table 3.9-4: Maximum Underwater Detonation Zones of Influence for "No Action" Alternative

Underwater Detonation Operation	Charge Weight Used[1]	Season	Level B Harrassment	Level A Harrassment		Mortality
			Onset of TTS[2] / Non-TTS[3] (yards)	Onset of slight lung injury (13.0 psi-msec) (yards)	50% TM rupture (205 dB re 1µPa^2-sec) (yards)	Onset of extensive lung injury (30.5 psi-msec) (yards)
Mine Countermeasures	20	Warm	470	360	80	80
		Cold	450	160	80	80
Floating Mine	≤ 5	Warm	240	20	80	20
		Cold	260	20	80	20
Unmanned Underwater Vehicle Activities	20	Warm	440	360	80	80
		Cold	400	150	80	80
Marine Mammal Systems Activities (sequential)	13	Warm	330/380	130	70	80
		Cold	410/430	140	70	80
Marine Mammal Systems Activities (individual)	13	Warm	320	130	60	80
		Cold	350	140	70	80
Dive Platoon[4] (mid-depth)	3.5	Warm	330/430	70	130	40
		Cold	410/610	70	130	40
Dive Platoon[4] (bottom)	3.5	Warm	330/470	80	90	50
		Cold	370/560	90	90	50
Mine Neutralization[4]	3.5	Warm	330/470	80	90	50
		Cold	370/560	90	90	50

[1] Charge weights are listed in pounds
[2] Maximum ZOE based on greatest range from dual criteria (182 dB re 1µPa^2-sec or 23 psi)
[3] Behavioral Disruption Non-TTS (listed only for (sequential detonations)
[4] Sequential Detonations

To reduce the potential for behavioral or physiological damage such as TTS, or tissue injury, a safety zone would be established each detonation area. As discussed in Section 3.9.1.7, operations would not be conducted if marine mammals are present in the safety zone. The safety zone for VSW underwater detonations (in zero to 24 feet of water), would be the largest zone of influence as discussed in Section 3.9.2.4.3 (1,300 feet). The safety zone for shallow water underwater detonation activities (in 24 to 72 feet of water depth) would be based on the largest zone of influence shown in Table 3.9-4: 1,410 feet (470 yards). This type of mitigation would likely prevent animals from being exposed to the loudest explosive effects that could potentially result in behavioral, TTS or PTS and more intense behavioral reactions. The implementation of the current mitigation and monitoring procedures in the SSTC, as described in Section

3.9.2.7, will minimize the potential for impacts to individual marine mammals or marine mammal stocks from underwater detonations.

Table 3.9-5: Modeled Estimates of Exposed Species from Underwater Detonations Without Implementation of Mitigation Measures: No Action Alternative

Species			NO ACTION ALTERNATIVE: Season Average Mammals Exposure (All Sources)			
			Level B Behavior (MSE only)	Level B TTS	Level A Injury	Level A Mortality
			177 dB	182 dB / 23 psi	205 dB / 13.0 psi-ms	30.5 psi-ms
Cetaceans	Gray Whale	Warm	-	-	-	-
		Cold	0	0	0	0
	Coastal Bottlenose Dolphin	Warm	16	26	0	0
		Cold	24	26	0	0
Pinnipeds	California Sea Lion	Warm	4	0	0	0
		Cold	24	26	0	0
	Harbor Seal	Warm	0	0	0	0
		Cold	0	0	0	0
Total Exposures			68	78	0	0

3.9.2.8.2 Aircraft Activities

Various types of helicopters are regularly used in training exercises throughout the ROI. These aircraft overflights produce airborne noise and some of this energy is transmitted into the water. Marine mammals could be exposed to noise associated with aircraft overflights while at the surface or while submerged. In addition to sound, marine mammals could react to the shadow of a low-flying aircraft and/or, in the case of helicopters, surface disturbance from the downdraft.

Transmission of sound from a moving airborne source to a receptor underwater is influenced by numerous factors and has been addressed by Urick (1972), Young (1973), Eller and Cavanagh (2000), Laney and Cavanagh (2000), and others. Sound is transmitted from an airborne source to a receptor underwater by four principal means:

1. Direct path, refracted upon passing through the air-water interface.
2. Direct-refracted paths reflected from the bottom in shallow water.
3. Lateral (evanescent) transmission through the interface from the airborne sound field directly above.
4. Scattering from interface roughness due to wave motion.

Aircraft sound is refracted upon transmission into water because sound waves move faster through water than through air (a ratio of about 0.23:1). Based on this difference, the direct sound path is totally reflected if the sound reaches the surface at an angle more than 13 degrees from vertical. As a result, most of the acoustic energy transmitted into the water from an aircraft arrives through a narrow cone with a 26-degree apex angle extending vertically downward from the aircraft (Figure 3.9-4). The intersection of this cone with the surface traces a "footprint" directly beneath the flight path, with the width of the footprint being a function of aircraft altitude.

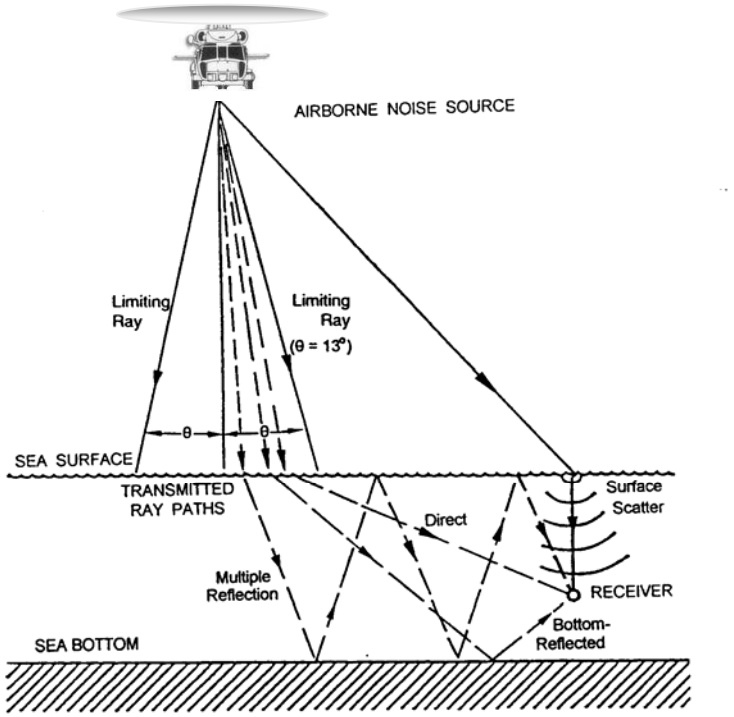

Figure 3.9-4: Characteristics of Sound Transmission through Air-Water Interface

Helicopter overflights can occur throughout SSTC for a variety of training exercises, such as mine countermeasure activities (Activities 4, 6, 7, and 12, Table 2-1), amphibious activities (Activities 16, 25, 26, Table 2-1), and Naval Special Warfare (NSW) activities (Activities 29 and 30, Table 2-1). Unlike fixed-wing aircraft, helicopter training activities can occur at low altitudes (approximately 100 feet) over the water, which increases the likelihood that marine mammals would respond.

Very little data are available regarding reactions of cetaceans to helicopters. One study observed that sperm whales showed no reaction to a helicopter until the whales encountered the downdrafts from the propellers (Clarke 1956). Other species such as bowhead whales and beluga whales show a range of reactions to helicopter overflights, including diving, breaching, change in direction or behavior, and alteration of breathing patterns, with belugas exhibiting behavioral reactions more frequently than bowheads (38 and 14 percent of the time, respectively) (Patenaude et al. 2002). These reactions were less frequent as the altitude of the helicopter increased to 150 m or higher.

Helicopter activities would have the greatest impact when flying low and hovering at altitudes down to 100 feet. Noise modeling indicates that the predicted sound level at a depth of 1 foot resulting from the overflight of an SH-60 helicopter at 100 feet would be approximately 100 to 118 dB re 1 µPa (frequencies

of 20 Hz and 5 kHz). This could cause some marine mammals to dive and move away from the aircraft. For example, gray whales will react 10 percent of the time to helicopter sounds transmitted underwater in excess of 115 dB re 1 µPa and react 50 percent of the time to sounds in excess of 120 dB re 1 µPa (Moore and Clarke 2002). Given the variable and sparse seasonal density of gray whales (Table 3.9-1), the probability of a helicopter overflight occurring over a migrating whale is low. Aircraft overflights over a cetacean in the water may elicit short-term reactions such as a dive, but they are highly unlikely to disrupt overall behavioral patterns such as migrating, nor would they be likely to result in serious injury.

One seal species (harbor) and one sea lion species (California) occur regularly within the ROI. Helicopters are used in studies of several species of seals hauled out and is considered an effective means of observation (Gjertz and Børset 1992; Bester et al. 2002; Bowen et al. 2006), although they have been known to elicit behavioral reactions such as fleeing (Hoover 1988). Jehl and Cooper (1980) indicated that low-flying helicopters, humans on foot, sonic booms, and loud boat noises were the most disturbing influences to pinnipeds. In other studies, harbor and other species of seals and sea lions showed no reaction to helicopter overflights (Gjertz and Børset 1992). However, there are no known haul-out locations for these two species within the SSTC. Additionally, the typical flight path of aircraft used in training activities does not overlap any known haul-out locations for harbor seals or sea lions. Thus, the likelihood of a harbor seal or California sea lion being hauled out and underneath the flight path of an aircraft is extremely low. It is possible that an animal could be temporarily hauled out on a buoy or dock and aircraft overflights may elicit short-term reactions such as flushing into the water, but they are highly unlikely to disrupt overall behavioral patterns such as foraging or breeding as the disturbance is transient and short-term in nature, allowig the animal to return to it's previous behavioral state. Similarly, aircraft overflights of pinnipeds in the water may elicit short-term reactions such as startle or alert reactions. However, they are highly unlikely to disrupt overall behavior patterns such as migrating, breeding, feeding and sheltering, nor would they be likely to result in serious injury.

Marine mammals exposed to low-altitude helicopter overflights under the No Action Alternative could exhibit short-term behavioral responses, but not to the extent where natural behavioral patterns would be abandoned or considerably altered. Helicopter overflights are not expected to result in chronic stress because it is extremely unlikely that individual animals would be repeatedly exposed. As such, helicopter overflights are not expected to result in Level A or Level B harassment as defined by the MMPA and helicopter overflights over territorial waters would have no notable effect on marine mammals.

3.9.2.8.3 Marine Vessels

Overview

A variety of vessels including standard and amphibious ships, small boats, and hovercraft (collectively referred to as vessels) will be used for SSTC activities. Vessel movements have the potential to affect marine mammals by directly striking or disturbing individual animals. The probability of vessel and marine mammal interactions occurring in the ROI is dependant upon several factors including numbers, types, and speeds of vessels; the regularity, duration, and spatial extent of activities; the presence/absence and density of marine mammals; and protective measures implemented by the Navy. Activities involving vessel movements occur intermittently and are variable in duration, ranging from a few hours up to two weeks. Under the No Action Alternative, marine vessels both mechanically driven and self-propelled are utilized in 41 of the 78 training activities (Activities 1- 3, 5 -14, 16, 18, 20 - 28, 32 - 35, 37 - 41, 44 - 46, 49, 51 - 53, 57, 77, 78, Table 2-1). The vast majority of these exercises use less than five marine vessels, both mechanically driven and self-propelled (Appendix C). These activities are widely dispersed throughout the marine areas of SSTC, which encompasses approximately 15 nm^2. Consequently, as these operations are spread throughout the year, as well as on any particular day of training activities, the density of ships within the ROI at any given time is extremely low.

Disturbance Associated with Vessel Movements

Marine mammals are frequently exposed to vessels due to research, ecotourism, commercial and private fishing traffic, and government activities. The presence of vessels has the potential to alter the behavior patterns of marine mammals. It is difficult to differentiate between responses to vessel sound and visual cues associated with the presence of a vessel; thus, it is assumed that both play a role in prompting reactions from animals. Anthropogenic sound has increased in the marine environment over the past 50 years (Richardson et al. 1995; NRC, 2003) and can be attributed to vessel traffic, marine dredging and construction, oil and gas drilling, geophysical surveys, sonar, and underwater explosions.

Marine mammals react to vessels in a variety of ways. Some respond negatively by retreating or engaging in antagonistic responses (breaching, fluke-slapping, etc.) while other animals ignore the stimulus altogether (Watkins, 1986; Terhune and Verboom, 1999). The predominant reaction is either neutral or avoidance behavior, rather than attraction behavior. For example, species of delphinids can vary widely in their reaction to vessels. Many exhibit mostly neutral behavior, but there are frequent instances of observed avoidance behaviors (Hewitt 1985; Würsig et al. 1998). In addition, approaches by vessels can elicit changes in behavior, including a decrease in resting behavior or change in travel direction (Bejder et al. 2006). Alternately, some of the delphinid species exhibit behavior indicating attraction to vessels. This can include solely approaching a vessel (David, 2002), and species such as common, rough-toothed and bottlenose dolphins are frequently observed bow riding or jumping in the wake of a vessel (Norris and Prescott, 1961; Shane et al. 1986; Würsig et al. 1998; Ritter 2002). These behavioral alterations are short-term and would not result in any lasting effects.

Gray whale responses to noise include changes in swimming speed and direction to move away from the sound source; abrupt behavioral changes from feeding to avoidance, with a resumption of feeding after exposure; changes in calling rates and call structure; and changes in surface behavior, usually from traveling to milling (e.g., Moore and Clarke 2002). Gailey et al. (2007) reported no apparent behavioral disturbances for gray whales in response to low-frequency seismic survey.

Marine vessels are one of the most frequent sources of sound in the marine environment within SSTC. Vessel noise is caused by both engine noise transmission through the hull and cavitations from propellers producing both narrow and broadband sounds. Hovercraft were recorded in the frequency ranges of 50 to 2000 Hz with a source level up to 121 dB re 1 µPa (Richardson et al. 1995). Recordings of a Griffon 2000TD hovercraft passing a hydrophone at full power in Prudhoe Bay, Alaska indicated broadband (10 to 10,000 Hz) levels reaching 133 dB re 1 µPa (Blackwell and Greene 2005), with most spectral energy centered around 87 Hz.

The probability of Landing Craft, Air Cushion (LCAC) and marine mammal interactions occurring in the ROI is dependant upon several factors including the regularity, duration, and spatial extent of activities; the presence/absence and density of marine mammals; and protective measures implemented by the Navy. Activities involving LCAC occur four times a year, involve small numbers of vessels, and occur along the boat and beach lanes of SSTC-N and SSTC-S. Consequently, the density of ships within the ROI during LCAC activities is extremely low, which when combined with the low densities of marine mammals, minimizes disturbance effects on marine mammals in the area; therefore, any effects would be extremely localized.

Sound produced may also be produced by vessels involved in the ELCAS training. Vessel noise is a combination of narrowband, tonal sounds at specific frequencies with broadband sounds with energy spread as a continuum across a wide range of frequencies up to 100 kHz (Greene and Moore, 1995). Source levels of boats used during SSTC ELCAS are expected to be low with small boats using outboards (120-150 dB) to tugboats working with barges (140 – 160 dB).

Marine vessel traffic related to the SSTC activities would pass near marine mammals only on an incidental basis. Most of the studies mentioned previously examine the reaction of animals to vessels that approach and intend to follow or observe an animal (i.e., whale watching vessels, research vessels, etc.). Reactions to vessels not pursuing the animals, such as those transiting through an area or engaged in training exercises, may be similar but would likely result in less stress to the animal because they would not intentionally approach animals. Cetacean species pay little attention to transiting vessel traffic as it approaches, although they may engage in last minute avoidance maneuvers (Laist et al. 2001). As previously noted, quick avoidance maneuvers are short-term alterations and are not expected to permanently impact a marine mammal.

Vessel movements under the No Action Alternative are not expected to result in chronic stress because, as discussed above, Navy vessel density in the ROI would remain low and the Navy implements mitigation measures to avoid marine mammals. General disturbance associated with vessel movements is not expected to result in Level A or Level B harassment as defined by the MMPA and vessel disturbances are highly unlikely to disrupt overall behavior patterns such as migrating, breeding, feeding and sheltering, of marine mammals in the ROI.

Vessel Collisions with Marine Mammals

Ship strikes are known to affect large whales in southern California waters. The most vulnerable marine mammals are those that spend extended periods of time at the surface in order to restore oxygen levels within their tissues after deep dives. These species are primarily large, slow moving whales. Smaller marine mammals (for example, bottlenose dolphins) move quickly throughout the water column and are often seen riding the bow wave of large ships.

After reviewing historical records and computerized stranding databases for evidence of ship strikes involving baleen and sperm whales, Laist et al. (2001) found that accounts of large whale ship strikes involving motorized boats date back to at least the late 1800s. Ship collisions remained infrequent until the 1950s, after which point they increased. Laist et al. (2001) concluded that most strikes occur over or near the continental shelf, that ship strikes likely have a negligible effect on the population status of most whale populations, but that for small populations or segments of populations the impact of ship strikes may be significant. However, in the near-shore waters of the ROI, any large whale appearing in the shallow water boat lanes would be readily apparent. Between 1975 and 2002, only two ship strikes of gray whales have been reported in the waters offshore of Point Loma, only one of which was attributed to naval activities.

Small numbers of California sea lions, harbor seals, or bottlenose dolphin may encounter Navy vessels in the SSTC. Given the low density of Navy ships in the ROI, the likelihood that a vessel collision would occur under the No Action Alternative is very low. Vessel collisions in territorial waters are highly unlikely and do not represent a notable source of effect on marine mammals.

3.9.2.8.4 Amphibious and Beach Activities

This section deals primarily with amphibious and beach activities that may have a potential to impact marine mammals. Beach and inland activities have a low potential for impact on marine mammals because there are no breeding or haul-out areas within the SSTC ROI. The following sections address those Amphibious and Beach activities that may affect the marine mammals expected to occur at SSTC.

ELCAS/Pile Driving

Pile driving will be conducted during installation of the ELCAS which is constructed to provide a quick and temporary pier structure for offloading Navy vessels. Under the No Action Alternative, ELCAS activities occur twice a year and occur either bayside at Bravo Beach, or oceanside at SSTC-North. Pile installation occurs over a period of approximately 10 days. Approximately 101 piles are driven in a typical ELCAS training event, with around 250 to 300 impacts per pile, and each pile taking on average 10 minutes to install. At the end of the training, a vibratory hammer attached to the pile head will be used to remove piles. Removal takes approximately 15 minutes per pile over a period of around 3 days.

The methodology for assessing impacts of pile installation and removal during ELCAS training on marine mammals is discussed in Section 3.9.2.6. It describes NMFS established Level A and B harassment thresholds, the practical spreading loss model, and the methodology for estimating ZOIs and marine mammal exposures for ELCAS pile driving and removal.

Actual noise levels of ELCAS pile driving at SSTC depend on the type of hammer used, the size and material of the pile, and the substrate the piles are being driven into. Using known equipment, installation procedures, and applying certain constants derived from other west coast measured pile driving, predicted underwater sound levels from ELCAS pile driving can be calculated. The ELCAS uses 24-inch diameter hollow steel piles, installed using a diesel impact hammer to drive the piles into the sandy on-shore and near-shore substrate at SSTC. For a dock repair project in Rodeo, California in San Francisco Bay, RMS underwater sound level for a 24 inch steel pipe pile driven with a diesel impact hammer in less than 4.6 m (15 ft) of water depth was measured at 189 dB re 1uPa from approximately 10 m (33 ft) away. RMS sound level for the same type and size pile also driven with a diesel impact hammer, but in greater than 11.0 m (36 ft) of water depth, was measured to be 190 to 194 dB RMS during the Amoco Wharf repair project in Carquinez Straits, Martinez, California (CADOT 2009). The areas where these projects were conducted have a silty sand bottom with an underlying hard clay layer, which because of the extra effort required to drive into clay, would make these measured pile driving sound levels louder (more conservative) than they would if driving into SSTC's sandy substrate. Given the local bathymetry and smooth sloping sandy bottom at SSTC, ELCAS piles will be driven in water depths of 11 m (36 ft) or less. Therefore, for the purposes of this analysis, both the Rodeo repair project (189 RMS) and the low end of the measured values of the Amoco Wharf repair projects (190 RMS) are considered to be reasonably representative of sound levels that would be expected during ELCAS pile driving at SSTC.

Using an this estimated RMS measurement of 190 dB re 1uPa at 10 m (33 ft), the circular zone of influence (ZOI) surrounding a 24-inch steel diesel-driven pile can be estimated to have a radius of 1,040 feet for the Level B behavioral harassment threshold (160 RMS) and 105 feet for Level A injurious harassment for cetaceans (180 dB RMS) and 33 feet for Level A injurious harrassment for pinnipeds (190 dB RMS) (Table 3.9-3). It should be noted that ELCAS pier construction starts with piles being driven near the shore and extends offshore. Near the shore, the area of influence would be a semi-circle and towards the end of the ELCAS (approximately 1,200 feet from the shore) would be a full circle. The above calculated area of influence conservatively assumes that all ELCAS piles driven are all driven offshore at SSTC, producing a circular zone of influence.

Noise levels derived from piles removed via vibratory extractor are different than those driven with an impact hammer. Steel pilings and a vibratory driver were used for pile driving at the Port of Oakland (CADOT 2009). Underwater sound levels during this project for a 24-inch steel pile in 11 m (36 ft) of water depth was field measured to be 160 dB RMS. The area where this projects was conducted has a harder substrate, which because of the extra effort required to drive the pile, would make these measured pile driving sound levels louder (more conservative) than they would if driving into SSTC's sandy substrate. Conservatively using this RMS measurement for SSTC, the zone of influence (ZOI) for a 24-inch steel pile removed via a vibratory extractor out to the 120 dB RMS Level B behavioral harassment

threshold can be estimated to be 3,280 feet (Table 3.9-3). Additionally, the distances to the 180 dB RMS Level A harassment threshold for cetaceans and the 190 dB RMS Level A harassment threshold for pinnipeds can be estimated as 3 and 1 feet, respectively. As discussed above, the above calculated area of influence conservatively assumes that all ELCAS piles driven are all driven offshore at SSTC, producing a circular zone of influence.

Table 3.9-3: Maximum Zones of Influence for ELCAS Activities

	Level B (Continuous noise)	Level B (Impulse)	Level A (Cetaceans)	Level A (Pinnipeds)
	120 dB RMS	160 dB RMS	180 dB RMS	190 dB RMS
Installation (Pile Driving)	N/A	1,040 ft	105 ft	33 ft
Removal (Vibratory)	3,280 ft	N/A	3 ft	1 ft

Based on the assesments conducted, using the methodology discussed in Section 3.9.2.5, and without consideration of current mitigation measures, activities under the No Action Alternative are not anticipated to expose marine mammals to injury (Level A harassment). However, ELCAS activities could result in limited non-injurious (Level B) harassment to cetaceans and pinnipeds during pile removals. Specifically, no annual exposures are predicted from pile installation activities, but nine annual exposures (6 bottlenose dolphins, 3 harbor seals) from pile removal activities could result in Level B harassment (Table 3.9-6). Exposures are not expected for California sea lions or gray whales. As mentioned previously, these exposure modeling results are estimates of marine mammal ELCAS sound exposures without consideration of standard mitigation and monitoring procedures.

Table 3.9-6: Estimates of Exposed Species to ELCAS Activities Without Implementation of Mitigation Measures: No Action Alternative

Species			NO ACTION ALTERNATIVE: Annual Estimated Mammals Exposure			
			Level B (Continuous)	Level B (Impulse)	Level A (Cetaceans)	Level A (Pinnipeds)
			120 dB RMS	160 dB RMS	180 dB RMS	190 dB RMS
Cetaceans	Gray Whale	Installation	N/A	0	0	0
		Removal	0	N/A	0	0
	Coastal Bottlenose Dolphin	Installation	N/A	0	0	0
		Removal	6	N/A	0	0
Pinnipeds	California Sea Lion	Installation	N/A	0	0	0
		Removal	0	N/A	0	0
	Harbor Seal	Installation	N/A	0	0	0
		Removal	3	N/A	0	0
Total Exposures			**9**	**0**	**0**	**0**

As presented for underwater detonations, behavioral responses from exposure to ELCAS pile driving can range from no observable response to other behavioral responses discussed previously (Southall 2007, NOAA 2009). According to the severity scale response spectrum proposed by Southall et al. (2007), responses classified as from 0-3 are brief and minor, those from 4-6 have a higher potential to affect foraging, reproduction, or survival and those from 7-9 are likely to affect foraging, reproduction and survival. While there is little data on the consequences of sound exposure on vital rates of marine mammals, given the limited duration of ELCAS training (<10 days), and the implementation of the current mitigation and monitoring procedures in the SSTC, as described in Section 3.9.2.7, potential for impacts to individual marine mammals or marine mammal stocks from ELCAS activities will be minimal.

3.9.2.8.5 Other Acoustic Sources

Mine Location—Acoustic Pingers

To facilitate inert mine recovery, high-frequency (35 to 43 kHz) pingers are occasionally attached to mines. The source level of the acoustic pinger is 70 - 75 dB re 1 µPa-m and these high frequency sounds attenuate rapidly in seawater, so any behavioral effects on marine mammals would be localized if they occurred at all. These emissions were not included in the modeling so potential marine mammals exposures from these sources were not estimated. However, it is unlikely that effects to marine mammals from these sources would be significant because of the limited emission times, rapid attenuation rate of high-frequency sound, and the limited area affected by these sources. Location pingers for inert mines do not constitute an adverse effect on the physiology and behavior of marine mammals and are not carried forward in this EIS.

Diver Recall Devices

Underwater exercises involving Navy divers include an underwater notification system alerting divers to return to boats or shore to conclude exercises. The noise associated with the Audible Recall Device (ARD) is broadband, though most energy is concentrated between 200 and 300 Hz. The duration of a diver recall device is one second or less and propagation models indicate that levels drop to below 2 psi·sec within 23 feet of the source. The ARD is only used at periodic intervals when needed to alert or recall underwater divers and do not represent a continuous acoustic source. Disturbance effects on the behavior of marine mammals, if any, would be extremely localized and short-term on the order of seconds to minutes. Potential avoidance behavior constitutes a minor and temporary change in behavior, with no adverse affect to overall behavior patterns. Therefore, recall devices are not carried forward in this EIS analysis.

3.9.2.9 Alternative 1 (Preferred Alternative)

Under Alternative 1, the Navy would increase the tempo of training, introduce new types of training activities, conduct existing routine training at additional locations within SSTC training areas, establish shallow water minefield, introduce new platforms and equipment, and increase access and availability to SSTC training areas. These components are discussed in detail in the following subsections.

3.9.2.9.1 Underwater Detonations

Underwater detonations occur in shallow water (less than 72 feet) within oceanside training lanes and the shock waves propagate over a mostly homogeneous sand substrate. As presented in Section 3.8.2.3.3 of (Table 3.8-12), underwater detonations would increase measurably from 103 activities under the No Action Alternative to 311 activities under Alternative 1. Under Alternative 1, five additional activities would be conducted: Shock Wave Generator (SWAG) (N1) and Unmanned Underwater Vehicle (UUV) Neutralization (N3), Airborne Mine Neutralization System (AMNS) (N7), Demolition Requalification

and Training/Underwater Detonations (N9), and NSW Underwater Demolition Training (N11) and the footprint of activities would be expanded to include SWAG detonations of up to 15 grams Net Explosive Weight (NEW) within San Diego Bay (Table 2-2). Zones of exposure were estimated for the different charge weights, charge depths, water depths, and seasons. These ZOI calculated ranges are shown in Table 3.9-7.

Shock Wave Generator (N1, Table 2-2) is a new activity under Alternative 1 that will take place within all boat training lanes and the San Diego Bay training areas. SWAG is a tool used to disarm enemy limpet mines, which have been attached to the hull of a ship. Under Alternative 1, SWAG is expected to occur up to 90 times a year in the San Diego Bay and nearshore waters of SSTC boat lanes.

UUV Neutralization (N3) is a new activity under Alternative 1 that would be conducted within SSTC Boat Lanes 1-14. Training consists of placing sequential charges consisting of a Seafox (3.3 pounds) or Archerfish (3.57 pounds) charge placed from depths of 10 feet to the bottom in water depths less than 72 feet.

AMNS (N7) is a new activity under Alternative 1 that would be conducted within SSTC Boat Lanes 1-14 (Table 2-2). Training consists of deployment of AMNS underwater vehicle that searches for, locates, and destroys mines. The vehicle is self-propelled and unmanned. Ten of the 48 annual activities culminate in the AMNS being remotely detonated when it encounters a simulated (inert) mine shape. The 3.3 pound NEW charge (PBXN110) would be manually detonated.

Demolition Requalification and Training/Underwater Detonations (N9) is a new activity under Alternative 1 that would be conducted within all boat training lanes. Training consists of requalifying or training teams in underwater detonations by conducting detonations on metal plates near the shore. Additionally, at depths of 10 to 72 feet, two sequential 12.5 to 13.75-pound charges are placed on the bottom or a single 25.5-pound charge is placed from a depth of 20 feet to the bottom.

NSW Underwater Demolition Training (N11) is a new activity under Alternative 1 would be conducted within all training lanes. Up to 40 persons participate in the activity, which involves small groups swimming to shore from four inflatable boats located approximately 1,000 yards offshore; boats may be beached on shore. A single charge of less than 10 pounds of C-4 explosives (if detonated on the bottom) or less than five pounds (if within five feet of the surface) is command detonated near the shoreline in water less than 24 feet deep.

Based on the modeling approach applied, as discussed in Section 3.9.2.4 and without consideration for mitigation measures, underwater detonations under Alternative 1 would result in the potential for noninjurious (Level B) harassment to cetaceans and pinnipeds, but there would be no potential for injurious (Level A) harassment or mortality. The modeled explosive exposure numbers by species are presented in Table 3.9-78. Specifically, 153 annual exposures to pressure from underwater detonations would result in TTS (Level B harassment). Of these 153 exposures, 98 annual exposures would result in TTS for bottlenose dolphins. Exposures of California sea lions comprise the remaining 55 annual exposures that would result in TTS. Exposures to grey whales and harbor seals are not anticipated due to low species density and the limited zone of influence of the proposed underwater detonations. These exposure modeling results are estimates of marine mammal underwater detonation sound exposures without consideration of standard mitigation and monitoring procedures.

Table 3.9-7: Maximum Zone of Influence for Underwater Detonation Activities Under Alternative 1.

Underwater Detonation Operation	Charge Weight Used[1]	Season	Level B Harrassment	Level A Harrassment		Mortality
			Onset of TTS[2] / Non-TTS[3] (yards)	Onset of slight lung injury (13.0 psi-msec) (yards)	50% TM rupture (205 dB re 1µPa^2-sec) (yards)	Onset of extensive lung injury (30.5 psi-msec) (yards)
Mine Countermeasures	20	Warm	470	360	80	80
		Cold	450	160	80	80
Floating Mine	5	Warm	240	20	80	20
		Cold	260	20	80	20
SWAG	0.033	Warm	60	0	0	0
		Cold	40	0	0	0
Unmanned Underwater Vehicle Activities	15	Warm	440	360	80	80
		Cold	400	150	80	80
Marine Mammal Systems Activities (sequential)	29	Warm	420/740	360	140	90
		Cold	470/650	170	140	90
Marine Mammal Systems Activities (individual)	29	Warm	400	360	100	90
		Cold	490	170	100	90
Dive Platoon (sequential)	3.5	Warm	330/470	80	90	50
		Cold	370/560	90	90	50
Qual/Cert (sequential)	13.75	Warm	330/470	140	100	80
		Cold	370/530	140	100	80
Qual/Cert (individual)	25.5	Warm	420	300	90	90
		Cold	470	170	90	90
Mine Neutral (sequential)	3.5	Warm	330/470	80	90	50
		Cold	370/560	90	90	50
UUV Neutral (sequential)	3.57	Warm	220/260	80	60	50
		Cold	230/280	90	60	50
AMNS	3.5	Warm	220	80	40	40
		Cold	230	80	40	40

[1] Charge weights are listed in pounds
[2] Maximum ZOE based on greatest range from dual criteria (182 dB re 1µPa^2-sec or 23 psi)
[3] Behavioral Disruption Non-TTS (listed only for (sequential detonations)

In addition to possible exposures that could result in TTS, the modeling without consideration of mitigation measures indicates that detonations under Alternative 1 also would result in the potential for 114 nonphysiological behavioral exposures. While physiological impacts were calculated for all activities, non-physiological behavioral impacts were calculated only for those exercises which involved multiple detonations during a training scenario. Coastal bottlenose dolphins were predicted to have a similar number of non-physiological behavioral exposures in both the warm (30) and cold (40) seasons, while California sea lions were predicted to have a higher number of non-physiological behavioral exposures during the cold season (40) than in the warm season (4). Modeling estimates indicate that no exposures of either coastal bottlenose dolphins or California sea lions exceeded injury criteria suggesting that risk of injury was low during a year of training at SSTC.

Table 3.9-8: Modeled Estimates of Species Exposed to Underwater Detonations Without Implementation of Mitigation Measures under Alternative 1

Species			ALTERNATIVE 1: Season Average Mammals Exposure (All Sources)			
			Level B Behavior (MSE only)	Level B TTS	Level A Injury	Level A Mortality
			177 dB	182 dB / 23 psi	205 dB / 13.0 psi-ms	30.5 psi-ms
Cetaceans	Gray Whale	Warm	-	-	-	-
		Cold	0	0	0	0
	Coastal Bottlenose Dolphin	Warm	30	43	0	0
		Cold	40	55	0	0
Pinnipeds	California Sea Lion	Warm	4	4	0	0
		Cold	40	51	0	0
	Harbor Seal	Warm	0	0	0	0
		Cold	0	0	0	0
Total Exposures			114	153	0	0

To reduce the potential for behavioral or physiological damage such as TTS or injury, a safety zone would be established around each detonation area. As discussed in Section 3.9.3, the current safety zone for 24 to 72 feet of water depth would be increased to 2,220 feet to accommodate the largest Level B behavioral harassment ZOI under Alternative 1 (MMS sequential detonations). The safety zone for VSW underwater detonations (in zero to 24 feet of water), would remain the same. Operations would not be conducted if marine mammals are sited in the safety zone. This type of mitigation would likely prevent animals from being exposed to the loudest explosive effects that could potentially result in behavioral, TTS or PTS and more intense behavioral reactions. Implementation of current mitigation and monitoring procedures in the SSTC, as described in Section 3.9.1.7, would minimize the potential for marine mammal exposures to underwater detonations. With implementation of mitigation measures, it is anticipated that exposures will be primarily behavioral, and are highly unlikely to disrupt overall behavior patterns such as migrating, breeding, feeding and sheltering, of marine mammals in the ROI.

3.9.2.9.2 Aircraft Activities

Implementation of Alternative 1 would result in similar effects to marine mammals as previously described under the No Action Alternative. The types of air activities proposed for Alternative 1 are consistent with those described under the No Action Alternative, although the frequency would increase and five new activities would be conducted (N4-N8, Table 2-2). As presented in Chapter 2 (Table 2-2 and 2-3) and detailed in Appendix C, helicopter activities over San Diego Bay and ocean waters within the ROI would more than double under Alternative 1 as compared to the No Action Alternative. Helicopter activities would have the greatest impact because of the low flying and hovering at altitudes down to 100 feet. Disturbance of marine mammals from the noise, physical presence, or sea surface disturbance from aircraft within the ROI would be limited to animals utilizing the area immediately adjacent to the activity and likely only within upper-most section of the water column. Any temporary effect to marine mammals near the surface remains a low probability considering the temporal variability of both training actions and the potential for marine mammals to be present near the sea surface within a specific training area. It is likely that few animals would be in the area and those approaching the area would avoid it if aircraft activities are being conducted. Therefore, there would be minimal effects to marine mammals from aircraft activities as a result of implementation of Alternative 1 and these effects are highly unlikely to disrupt overall behavior patterns such as migrating, breeding, feeding and sheltering, of marine mammals in the ROI.

In addition, one new air activity utilizing helicopters with a mounted Light Detection and Ranging (LIDAR) blue-green laser used to detect, classify, and localized floating and near-surface mines in shallow water (N5) would be added under Alternative 1 (Table 2-2). Zorn et al. (1998) collected information about current laser safety standards and investigated retinal damage mechanisms for humans, and research on eye anatomy for humans, cetaceans, and pinnipeds in an attempt to determine laser safety thresholds for cetaceans and pinnipeds. Zorn et al. developed a sensitivity ratio to compare the human eye sensitivity to that of marine mammals and concluded that the human eye is more sensitive to laser radiation than either the cetacean eye or the pinniped eye.

Cetaceans and pinnipeds have adapted to living in bright sunlight and dark ocean waters. In bright light, a highly constricted pupil keeps the received energy levels down, while in darker conditions, a pupil can be fully opened to admit as much light as possible. It is unlikely an animal would have fully dilated pupils at the surface, especially during daylight hours. If marine mammals were directly illuminated by a LIDAR source, this highly constricted pupil would further reduce the received energy, as Airborne Laser Mine Detection System activities are restricted to daylight hours. Although the likelihood that an oceanographic LIDAR's laser beam would directly contact a cetacean or pinniped eye is unknown, both cetaceans and pinnipeds spend a significant amount of time underwater and are widely scattered at sea. Large groupings at sea are easy to spot and would be avoided by helicopter operators. Combining this information with the low number of annual activities, temporal variability of training actions, lower sensitivity to laser radiation, low potential for marine mammals to be present near or at the sea surface within a specific training area, and the low probability of direct eye contact of a moving LIDAR laser, the use of LIDAR poses a minimal risk to marine mammals.

3.9.2.9.3 Marine Vessels

Marine vessels increase in use and scope under Alternative 1 compared to the No Action Alternative. Increases to on water activity by marine vessels in both ocean and San Diego Bay training areas would increase the probability of effect on marine mammals from disturbance and physical injury, though the anticipated level of impact from these activities is expected to remain low. The greatest increases to marine vessel activities would be attributed to new activities; SWAG (N1) and Surf Zone Test Detachment (N2) as well as increases to existing activities, SDV/ASDS Cert training and Barge Ferry/Causeway Coxswain training (Table 2-2).

3.9.2.9.4 Amphibious and Beach Activities

ELCAS / Pile Driving

Under Alternative 1, the number of ELCAS events will increase from two to four activities annually. The training locations, pile driver, and pile type and size would remain the same as in the No Action Alternative. As such, the ZOIs shown in Table 3.9-3 for pile driving would also be the same as in the No Action Alternative.

Based on assessments conducted (discussed in Section 3.9.2.5), and without consideration of current mitigation measures, activities under Alternative 1 are not expected to cause injury (Level A harassment) to marine mammals. However, ELCAS pile removal activities could result in behavioral (Level B) harassment to 18 cetaceans and pinnipeds (Table 3.9-9). As mentioned previously, these exposure modeling results are estimates of marine mammal ELCAS sound exposures without consideration of standard mitigation and monitoring procedures.

Table 3.9-9: Estimates of Exposed Species to ELCAS Activities Without Implementation of Mitigation Measures under Alternative 1

Species			Annual Estimated Mammals Exposure			
			Level B (Continuous)	Level B (Impulse)	Level A (Cetaceans)	Level A (Pinnipeds)
			120 dB RMS	160 dB RMS	180 dB RMS	190 dB RMS
Cetaceans	Gray Whale	Installation	N/A	0	0	0
		Removal	0	N/A	0	0
	Coastal Bottlenose Dolphin	Installation	N/A	0	0	0
		Removal	12	N/A	0	0
Pinnipeds	California Sea Lion	Installation	N/A	0	0	0
		Removal	0	N/A	0	0
	Harbor Seal	Installation	N/A	0	0	0
		Removal	6	N/A	0	0
Total Exposures			**18**	**0**	**0**	**0**

The available scientific literature suggest that introduction of pile driving into the marine environment could result in short term behavioral and/or physiological marine mammal impacts such as: altered headings; increased swimming rates; changes in dive, surfacing, respiration, feeding, and vocalization patterns; masking, and hormonal stress production (Southall et al., 2007); however, some field studies also suggest marine mammals do not observably respond to construction type sounds such as drilling (e.g., Richardson et al., 1990, 1991; Moulton et al., 2005). Individual animal responses are likely to be highly variable depending on situational state, and prior experience or habituation. Southall et al. 2007 point out that careful distinction must be made of brief minor, biologically unimportant reactions as compared to profound, sustained or biologically meaningful responses related to growth, survival, and reproduction. Populations of bottlenose dolphins, California sea lions, and harbor seals in and adjacent to San Diego Bay and SSTC have likely been historically exposed and potentially habituated to multiple

regional anthropogenic underwater noise sources (i.e., commercial shipping, recreational boating, in-water construction, aircraft overflights, etc.)

The implementation of the current mitigation and monitoring procedures in the SSTC, as described in Section 3.9.2.7, will minimize the potential for impacts to individual marine mammals or marine mammal stocks from ELCAS activities.

Other Acoustic Sources

Two activities are proposed under Alternative 1 that introduce an additional source of high-frequency noise into the marine environment. UUV Neutralization and AN/AQS-20 Mine Hunting (N3 and N4) introduce high-frequency sidescan sonars, which are operated at frequencies greater than 200 kHz. It is important to note that, as a group, marine mammals have functional hearing ranging from 10 Hertz (Hz) to 180 kHz; however, their best hearing sensitivities are well below that level. Since sonar sources operating at 180 kHz or higher attenuate rapidly and are at or outside the upper frequency limit of even the ultrasonic species of marine mammals, further consideration and modeling of these higher frequency acoustic sources are not warranted.

3.9.2.10 Alternative 2

Implementation of Alternative 2 would increase the total operational training tempo to the same levels as presented for Alternative 1 (Table 2-2 and 2-3). Similar to Alternative 1, Alternative 2 would include the introduction of new types of training; conducting existing routine training at additional locations within SSTC established training areas, and increasing access to and availability of existing beach and inland training areas. The only difference between Alternative 1 and 2 is that all SSTC-N oceanside beach training areas would be available for use, regardless of time of year. Since the differences between Alternative 1 and Alternative 2 are terrestrial, the impacts associated with Alternative 2 would be the same as those described above for Alternative 1.

3.9.3 Proposed Mitigation Measures

Given implementation of the current mitigation measures for SSTC activities (described in detail in Section 3.9.1.7), there would be minimal impacts to marine mammals under any of the alternative actions considered in this EIS.

Mitigation measures for oceanside underwater detonations would remain the same as described in Section 3.9.1.7; however, the safety buffer for shallow water detonations (in 24 to 72 feet of water) would be increased to 2,220 feet. The safety buffer increase would accommodate the largest Level B behavioral harassment ZOI shown in Table 3.9-7 under Alternatives 1 and 2 (MMS sequential detonations).

In addition, the Navy would implement mitigation measures for underwater detonations involving SWAG, which are proposed in Alternative 1 and 2, but are not currently conducted. Mitigation measures for SWAG detonation training are described below. Similar to existing mitigation measures, the physical topography, the lack of protected species on the range, and the type of Navy training routines allow for exceptionally reliable and effective mitigation procedures. Marine mammal species can be detected within a radius that extends out to the distance at which only the lowest degree of TTS would be expected to occur. That is, the procedures described in this section mitigate the potential for Level A harassment by injury and Level B harassment associated with TTS since explosives are not detonated when protected species are in the area associated with those effects. Mysticetes and large odontocetes are rarely, if ever, present in the shallow offshore waters of the SSTC. Were large marine mammals to approach the area—even far beyond the mitigation zone—they would be immediately obvious to the shore or safety-boat observers. The SSTC ROI is not known to be a preferred feeding site for small marine mammals. Thus,

the principal concern is for protection of small odontocetes (dolphins and small whales) and carnivora (sea lions) that only occasionally transit though the site. It follows that the mitigation zones, to be described below, are determined by estimates of the propagated peak-pressure and energy in the 1/3 octave-band of highest energy above 100 Hz—i.e., in the range of hearing of small odontocetes.

The following mitigation measures are consistent with existing training objectives and activities as well as established human safety procedures. In case of unanticipated conflict, human safety considerations will take precedence and such conflicts are always used to make incremental improvements in the procedures used in subsequent activities.

For SWAG charges laid bayside on SSTC at the locations described:

1. A safety buffer zone of 180 feet will be established around each SWAG detonation point.
2. Observer(s) with binoculars and small craft will survey the detonation area and the safety buffer zone for marine mammals from at least 10 minutes prior to commencement of the scheduled explosive event until at least 10 minutes after detonation. Observers will pay extra attention within the buffer zone to large amounts of floating kelp strands and other marine debris (if any), since these may provide shelter and food for marine mammal prey.
3. Divers placing charges on mines and dive support vessels will check the area immediately around the mine location for marine mammals.
4. If a marine mammal is sighted within the buffer zone or moving towards it, exercises will be suspended until the animal has voluntarily left the area and the area is clear of sea turtles and marine mammals for at least 10 minutes.
5. Immediately following the detonation, visual monitoring for marine mammals within the buffer zone will continue for 10 minutes. Any animals appearing will be observed for signs of injury. Injured marine mammals will be reported to the CNRSW Environmental Director, the PACFLT Environmental Office, and NMFS.

3.9.4 Impacts to Marine Mammal Species or Stocks

Overall, the conclusions in this analysis find that impacts to marine mammal species and stocks would be negligible for the following reasons:

- Acoustic harassments are within the non-injurious temporary threshold shift (TTS) or behavioral effects zones (Level B harassment). There are no exposures to sound levels or pressure that could cause permanent threshold shift (PTS)/injury (Level A harassment) resulting from the summation of the modeling.
- Although the numbers presented for the No Action Alternative (Table 3.9-5 and 3.9-6), Alternative 1 and Alternative 2 (Table 3.9-8 and 3.9-9) represent estimated harassment under the Marine Mammal Protection Act (MMPA), as described above, they are likely overestimates of harassment, primarily by behavioral disturbance. In addition, the model calculates harassment without taking into consideration standard mitigation measures, and is not indicative of a likelihood of either injury or harm.
- Additionally, the mitigation measures described in Section 3.9.1.7 and Section 3.9.3 are designed to reduce sound exposure of marine mammals to levels below those that may cause “behavioral disruptions” and to achieve the least practicable adverse effect on marine mammal species or stocks.

Consideration of negligible impact is required for NMFS to authorize incidental take of marine mammals. By definition, an activity has a “negligible impact” on a species or stock when it is determined that the

total taking is not likely to reduce annual rates of adult survival or recruitment (i.e., offspring survival, birth rates). Using each species' life history information, the expected behavioral patterns in the SSTC training and exercise locations, and an analysis of the behavioral disturbance levels in comparison to the overall population presented for each species, these species-specific analyses support the conclusion that proposed SSTC training events would have a negligible impact on marine mammal populations.

3.9.5 Unavoidable Adverse Environmental Effects

There are no unavoidable adverse environmental effects on marine mammals. Implementation of protective measures minimizes any impacts associated with SSTC training activities.

3.9.6 Summary of Effects

Modeling estimates for the No Action Alternative indicate that no exposures would result in slight injury, severe injury, or mortality of any marine mammal. Without implementation of current mitigation measures, 78 annual exposures to pressure from underwater detonations could result in TTS and 68 annual exposures could result in nonphysiological behavioral exposures (Level B harassments). In addition, nine annual exposures (6 bottlenose dolphins, 3 harbor seals) from pile removal activities could result in Level B harassment. However, implementation of the current mitigation measures will minimize the potential impacts to marine mammal species in the SSTC and the remaining potential impacts are highly unlikely to disrupt overall behavior patterns such as migrating, breeding, feeding and sheltering, of marine mammals in the ROI.

Modeling estimates for Alternatives 1 and 2 indicate that without implementation of current mitigation measures, 153 annual exposures to pressure from underwater detonations could result in TTS and 114 annual exposures could result in nonphysiological behavioral exposures (Level B harassments). In addition, 18 annual exposures (12 bottlenose dolphins, 6 harbor seals) from pile removal activities could result in Level B harassment.No exposures would result in slight injury, severe injury, or mortality. However, implementation of the current mitigation measures will minimize the potential impacts to marine mammal species in the SSTC.

Based on the above analysis, the Navy has submitted an application for an Incidental Harassment Authorization to NMFS per the requirements of MMPA for proposed training activities that have the potential to incidentally take marine mammals.

Table 3.9-10 presents a summary of effects and mitigation measures for the No Action Alternative, Alternative 1, and Alternative 2.

Table 3.9-10: Summary of Effects

Alternative	Effects
No Action Alternative	• Modeling estimates for the No Action Alternative indicate that exposures are not expected to result in slight injury, severe injury, or mortality of marine mammals. Without implementation of current mitigation measures, underwater detonations and pile driving could result in behavioral and TTS (Level B) harassment exposures. However, implementation of current mitigation measures minimizes potential impacts to marine mammal species in the SSTC ROI. • The implementation of current mitigation and monitoring procedures in the SSTC will minimize the potential for marine mammal exposures to pile-driving noise associated with ELCAS activities. • Ship collisions are unlikely due to the low density of marine mammals in the area.
Alternative 1	• Modeling estimates for Alternative 1 indicate that without implementation of current mitigation measures, an increased tempo of underwater detonations and pile driving could result in an increase of behavioral and TTS (Level B) harassment. No exposures are expected to result in slight injury, severe injury, or mortality. Implementation of current mitigation measures would minimize potential impacts to marine mammal species in the SSTC ROI. • Ship collisions are unlikely due to the low density of marine mammals in the area. • Effects from other activities are the same as described under the No Action Alternative.
Alternative 2	• With implementation of current mitigation measures, effects are the same as described under Alternative 1.
Mitigation	• Mitigation measures for underwater detonations and ELCAS activities include monitoring of safety buffer zones and restriction of activities to when marine mammals are outside prescribed buffer zones.