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REVISED FINDINGS ON CONSISTENCY DETERMINATION

Consistency Determination No.: **CD-008-13**

Federal Agency: **Department of the Navy**

Location: Southern California (SOCAL) Range Complex, a 120,000 square nautical mile (nmi^2) area including Santa Barbara, Santa Catalina, San Nicolas, and San Clemente Islands, and offshore waters, and offshore waters at the Silver Strand Training Complex (SSTC), Coronado (Exhibits 1-5)

Project Description: California portion of Hawaii-Southern California Training and Testing Program – Continuation of and modifications to Navy training and testing activities

Commission Action: Objection

Prevailing Commissioners: Commissioners Bochco, Brennan, Garcia, McClure, Mitchell, Sanchez, Zimmer, Vice-Chair Kinsey, and Chair Shallenberger

Note: To accurately reflect the Commission's action, staff's modifications to the February 21, 2013, Staff Recommendation (incorporating the changes from the March 6, 2013, Addendum) are shown herein as ~~strikethrough~~ and underline text. The recommended modifications are in the following sections:

Summary, pages 2-4.
Section II. (Action, Motion and Resolution), pages 7-9.
Section III. (Applicable Legal Authorities), pages 9-11.
Section IV. E (Marine Resources), pages 43-45.
Section IV. F (Commercial Fishing), page 48.

SUMMARY OF COMMISSION ACTION

The U.S. Department of the Navy (Navy) has submitted a consistency determination for the California portion of its Hawaii-Southern California Training and Testing Program. The program involves a large number of training and testing activities, primarily within existing offshore Navy range complexes and ocean operating areas (OPAREAs), as well as at Navy piers, ports, and shipyards. The program does not include training and testing activities on land (i.e., *onshore* activities at San Clemente Island or the Silver Strand Training Complex).

Briefly, the training elements involve anti-air warfare, amphibious warfare, strike warfare, anti-surface warfare, anti-submarine warfare, electronic warfare, and mine warfare activities. The testing activities involve Naval Air Systems Command Testing, Naval Sea Systems Command Testing, Space and Naval Warfare Systems Command Testing, and Office of Naval Research and Naval Research Laboratory Testing.

The standard of review for this Commission's review of federal consistency determinations is whether the project described in the consistency determination is consistent to the maximum extent practicable with the enforceable policies of the California Coastal Management Program (i.e., with Chapter 3 of the Coastal Act).

Based on the Navy's modeled estimates under the Marine Mammal Protection Act (MMPA), which use newer lower thresholds than the Navy applied the last time the Commission reviewed these types of activities (in 2008), and assuming that all the marine mammal species in the project area can be considered coastal species (as explained in pages 1~~8~~6-21~~8~~ below), the proposed activities could result in the behavioral harassment (qualifying as "Level B take" under the MMPA) of up to 1.78 million marine mammals per year, "Level A" take of up to 336 marine mammals, and up to 26 mortalities. Despite these modeled numbers, and the large number of "takes" requested in the Navy's application to the National Marine Fisheries Service (NMFS), the Navy concludes that the activities would not result in population-level effects to any species, and would be consistent with Coastal Act Section 30230.

The Commission ~~staff~~ does not believe that the Navy's conclusions are supported by ~~the~~ sufficient evidence. A recent beaked whale study calls into the question the Navy's conclusion with respect to beaked whales in southern California, and in any event, for all the affected marine mammals, it is simply impossible to establish whether population level effects have been

occurring, or would occur with the proposed increased training and testing levels, in part due to the fact that the Navy has been using this technology in this area consistently for the past 40 years. The Navy's conclusion, based on its monitoring, of a "lack of observable effects" is also called into question by recent studies designed to more comprehensively measure marine mammal reactions to military sonar and military-like sonar sounds, conducted in areas where the Navy trains such as SOCAL and the Bahamas. To date the studies have documented marine mammal reactions at sound levels far below the exposures the louder sources would generate. Also, if, as the Navy assumes in its modeling estimates, animals are moving away from the source, such movements would themselves be obvious effects, and significant, if they occurred while the animals were engaged in biologically significant behaviors such as feeding or mating.

~~Thus, even more compelling evidence is available now than it was in 2008 to establish the need for additional avoidance, monitoring, and mitigation measures, in order find the proposed increased training and testing activities consistent with the requirements of Section 30230.~~ In any event, ~~R~~regardless of whether population-level effects are occurring (or would occur from the proposed increases), the Coastal Act's marine resource protection policy (Section 30230) also requires enhancement (and where feasible restoration) of the overall marine environment, as well as special protection for areas and species of special biological or economic significance.

~~In the past these requirements have led the Commission to determinethat they necessitate the avoidance of the use of very loud active acoustic sources in biologically important and sensitive areas, in particular areas of high, or seasonally high, concentrations of marine mammals.~~ Under the current proposal, and given the information provided by the Navy, the Commission has determined that the consistency determination lacks sufficient information to enable it to determine consistency with the marine resource policy (Section 30230). The Commission makes this determination because the Navy's analysis: (1) only looked at population-level effects; (2) arbitrarily limited its analysis to only 10 of the 32 coastal species present in the southern California study area; (3) did not include the type of population-level analysis Pacific Gas and Electric Company had provided in its high energy seismic survey consistency certification (CC-027-12); (4) provided no explanation as to why significant intensification of use of mid-frequency sonar was needed for military training and testing; and (5) failed to analyze and consider alternatives such as implementing "time-area" closures, as well as other mitigation measures previously adopted by the Commission.

~~The staff is recommending that the Commission find that, for the activities to be consistent with Section 30230, conditions are needed to: (1) establish larger shutdown areas (up to 2 km) when marine mammals or other species are detected; (2) avoid use of mid-frequency sonar in sensitive areas, which would include Marine Protected Areas and Marine Sanctuaries, seasonal blue and gray whale areas and migration corridors, nearshore areas, and any biologically sensitive area NMFS may designate at a future date; (3) reduce sound under low-visibility conditions; (4) limit typical vessel speeds in sensitive areas to 10 knots (unless higher speeds are necessary for training); (5) improve observer effectiveness training; and (6) implement a contingency plan for use of nearshore explosives, in the event further mortalities (than the March 2011 incident discussed herein) occur. If the Navy were to agree to these conditions, the staff believes the Commission could find the activities consistent with Section 30230.~~

The Commission therefore objects to the Navy's consistency determination, finding that the Navy has not provided sufficient information to enable the Commission to determine the training and testing activities' consistency with Section 30230 of the Coastal Act.

The Commission also finds it has insufficient information to enable it ~~T~~to find the activities consistent with the commercial fishing policies of the Coastal Act, ~~the staff is recommending a condition requiring~~because the Navy has not explained why it is unable to implement measures recommended for consideration in its 2009 fishing survey (or provide an explanation to the Commission why implementation is infeasible).

The ~~staff is recommending that the~~ Commission finds the project as proposed consistent with the public access and recreation policies of the Coastal Act.

~~Thus, the staff is recommending conditional concurrence with the Navy's consistency determination. If the Navy does not agree with the conditions, then the conditional concurrence will be treated as an objection.~~

TABLE OF CONTENTS

APPENDICES

[Note: To save paper, printed copies of this version of the findings will not include the exhibits (except Exhibit 22, which was not previously included in the printed material). They are available upon request and can also be found on the Commission's website at: http://documents.coastal.ca.gov/reports/2013/3/F9a-3-2013.pdf. All exhibits will be posted on the April meeting website.]

EXHIBITS

Exhibit 1 – Overall Training Area
Exhibit 2 – Specific Training Area - SOCAL
Exhibit 3 – Specific Training Area – San Clemente Island Offshore
Exhibit 4 – Specific Training Area - San Clemente Island Nearshore
Exhibit 5 – Specific Training Area – Silver Strand Training Complex
Exhibit 6 – NMFS Marine Mammal Survey Maps
Exhibit 7 – Navy Beaked Whale Survey Map
Exhibit 8 – Navy CD Table 2-1 – Stressors Analyzed for Coastal Zone Effects
Exhibit 9 – Marine Protected Areas and Other Sensitive Areas
Exhibit 10 – Blue Whale Seasonally Sensitive Areas
Exhibit 11 – Navy LOA Request - Behavioral Reaction Analysis
Exhibit 12 – NMFS Proposed Rule Summary of Navy Monitoring
Exhibit 13 – Navy Behavioral Thresholds and Criteria
Exhibit 14 – Navy LOA Request - 6 dB ranges and percentages
Exhibit 15 – Navy Measures Implemented after March 2011 Dolphin Mortalities
Exhibit 16 – Navy 2009 Fishing Survey Recommendations
Exhibit 17 – Navy CD Appendix B - Stressors Matrix
Exhibit 18 – Navy CD Appendix A – Baseline and Proposed Training Activities
Exhibit 19 – CCC Conditions, Navy CDs CD-049-08 and CD-086-06
Exhibit 20 – Fin whale high concentration areas
Exhibit 21 - Letter, NOAA Administrator Jane Lubchenco, to Council on Environmental Quality Chair Nancy Sutley, dated January 19, 2010
Exhibit 22 – Composite Slide, Biologically Significant Areas (shown at hearing)

CORRESPONDENCE (Separate Attachment) Letter, NRDC to CCC, February 20, 2013

I. FEDERAL AGENCY'S CONSISTENCY DETERMINATION

The Department of the Navy has determined the project consistent to the maximum extent practicable with the California Coastal Management Program (CCMP).

II. COMMISSION ACTION, MOTION AND RESOLUTION

A. OBJECTION

On March 8, 2013, by a vote of 0 in favor, 8 opposed, the Commission objected to the consistency determination submitted by the Navy on the grounds that it has insufficient evidence in the record to determine whether the project will be in consistent to the maximum extent practicable with the policies of Chapter 3 of the Coastal Act.

B. MOTION AND RESOLUTION

Staff recommends that the Commission adopt the following motion in support of its decision:

Motion

I move that the Commission adopt the following findings in support of its objection to the Navy's consistency determination CD-008-13.

The staff recommends a YES vote on this motion. Pursuant to section 30315.1 of the Coastal Act, adoption of findings requires a majority vote of the members of the prevailing side present at the March 8, 2013, hearing, with at least three of the prevailing members voting. Only those Commissioners on the prevailing side of the Commission's action are eligible to vote. A majority vote by the prevailing Commissioners listed on page 1 of this report will result in adoption of the findings.

Resolution to Adopt Revised Findings

The Commission hereby adopts the findings set forth below for consistency determination CD-008-13 submitted by the Navy for the proposed project on the grounds that the findings support and accurately reflect the reasons for the Commission's March 8, 2013, objection and determination that it lacks sufficient information to determine the project would be consistent to the maximum extent practicable with the CCMP.

~~**Motion:**~~

~~*I move that the Commission* ***conditionally concur*** *with consistency determination CD-008-13 by concluding that 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.*~~

Staff recommends a **YES** vote on the motion. Passage of this motion will result in a concurrence with the determination of consistency, provided the project is modified in accordance with the recommended conditions, 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:

*The Commission hereby **conditionally concurs** with consistency determination CD-008-13 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.*

III. CONDITIONS

1. Safety Zones. The Navy will cease sonar transmissions whenever a marine mammal or sea turtle is detected within 2 km of the sonar dome, unless the sonar is being used at a critical point in the exercise such that the commanding officer determines certification or training effectiveness would be at risk.

2. Biologically Significant Areas. To the maximum extent feasible, the Navy will avoid exposing the following areas to high intensity active sonar. Avoidance will include a 4 km area around each of the following areas, for the MF1 Class Sonar (and for less intense sonars, a corresponding distance that would be the equivalent to the exposure level an MF1 Class would generate):

(a) the Channel Island National Marine Sanctuary (including around Santa Barbara Island);
(b) State and federal Marine Protected Areas (the areas shown on Exhibit 9);
(c) blue and fin whale high concentration areas (in the areas shown on Exhibits 10 & 20), seasonally, June thru November;
(d) known gray whale migration corridors, when gray whales are seasonally present;
(e) 1 km from shore (to protect coastal bottlenose dolphins); and
(f) any future NMFS-designated Biologically Important Area (BIA).

3. Night and low visibility conditions. To the maximum extent feasible, whenever any portion of the safety zone cannot be effectively monitored (including but not limited to nighttime, high sea state conditions (such as greater than Beaufort Stage 4 sea state), fog or other factors), the Navy will either avoid active sonar use, or will operate mid-frequency sonar under reduced power (i.e., a 6 dB reduction). If the latter, the Navy will use additional detection measures, such as infrared (IR) or enhanced passive acoustic detection. In addition, to the maximum extent feasible, gunnery exercises and exercises involving explosives in excess of 20 lbs. will be limited to daytime use.

4. Vessel Speeds. Except where higher speeds are critical to military training needs, in the areas (and when applicable, seasons) in Condition 2, and when transiting the Santa Barbara Channel (during June thru November), vessel speeds shall not exceed 10 knots.

~~5. **Effectiveness Training.** The Navy will continue its Lookout Effectiveness Study in the SOCAL range to compare the abilities of Navy vessel-based lookouts and experienced, NMFS-certified marine mammal observers in detecting marine mammals. To the maximum extent feasible, the study will be implemented, and marine mammal observers will carry out marine mammal searches onboard Navy vessels during the deployment of active sonar. During all times when marine mammal observers embark on Navy vessels, Navy lookouts and marine mammal observers will make use of the same equipment, search protocols, search distances, and search methods and shall carry out concurrent and independent marine mammal searches. All marine mammal detections will be recorded, will include distance and group number estimates, and will also specify whether the detection was made by a marine mammal observer, Navy lookout, or both parties independently. This marine mammal detection data will be submitted to the Commission's Executive Director for his review within one month of each marine mammal observer embark. If the results of the effectiveness study demonstrate that experienced, NMFS-certified marine mammal observers are more than 20% more likely than Navy observers to detect marine mammals, the Navy will, to the extent feasible, commit to including at least two experienced, NMFS-certified marine mammal observers on all ships during the deployment of active sonar for training or testing purposes. These marine mammal observers will notify appropriate Navy personnel of all marine mammal detections and will assist in the enforcement of marine mammal safety zones.~~

~~6. **Explosives Training Using Timer Delays.** In the event that an additional incident occurs where one or more marine mammal or sea turtle mortality results from a Navy exercise using timer delays, the Navy will either implement fail-safe technology (e.g., "positive" controls) or commit to including aerial monitoring during all future training events involving timer delay use with explosives.~~

~~7. **Fishing Communications Improvements.** Within one year, the Navy will agree to implement the recommendations of its 2009 Fishing Survey (listed on pages 42-43 below) or provide an explanation to the Commission as to why the Navy considers implementation infeasible.~~

III~~V~~. APPLICABLE LEGAL AUTHORITIES

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). The implementing regulations for the CZMA ("federal consistency regulations"), at 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." In its consistency determination, the Navy 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, which are the policies of Chapter 3 of the Coastal Act (Cal. Pub. Res. Code §§ 30200-30265.5).

~~**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.**~~

Objection based on lack of information~~**Standard of Review**~~
The federal consistency regulations (15 CFR § 930.43) provide for state agency objections based on lack of information, as follows:

> *§ 930.43 State agency objection.*
>
> *(b) If the State agency's objection is based upon a finding that the Federal agency has failed to supply sufficient information, the State agency's response must describe the nature of the information requested and the necessity of having such information to determine the consistency of the Federal agency activity with the enforceable policies of the management program.*
>
> *(c) State agencies shall send to the Director a copy of objections to Federal agency consistency determinations.*

(d) In the event of an objection, Federal and State agencies should use the remaining portion of the 90-day notice period (see § 930.36(b)) to attempt to resolve their differences. If resolution has not been reached at the end of the 90-day period, Federal agencies should consider using the dispute resolution mechanisms of this part and postponing final federal action until the problems have been resolved. At the end of the 90-day period the Federal agency shall not proceed with the activity over a State agency's objection unless:

(1) the Federal agency has concluded that under the "consistent to the maximum extent practicable" standard described in section 930.32 consistency with the enforceable policies of the management program is prohibited by existing law applicable to the Federal agency and the Federal agency has clearly described, in writing, to the State agency the legal impediments to full consistency (See §§ 930.32(a) and 930.39(a)), or

(2) the Federal agency has concluded that its proposed action is fully consistent with the enforceable policies of the management program, though the State agency objects.

(e) If a Federal agency decides to proceed with a Federal agency activity that is objected to by a State agency, or to follow an alternative suggested by the State agency, the Federal agency shall notify the State agency of its decision to proceed before the project commences.

IV. FINDINGS AND DECLARATIONS

A. PROJECT LOCATION AND DESCRIPTION

The Navy proposes to conduct a large number of training and testing activities, which would include the use of active sonar and explosives, primarily within existing range complexes and ocean operating areas (OPAREAs); at Navy piers, ports, and shipyards; and at contractor shipyards located along the U.S. Pacific coast, as well as in the transit corridor between Southern California and Hawaii. The proposal also includes pierside sonar testing conducted as part of overhaul, modernization, maintenance, and repair activities at Navy piers in Southern California. Training and testing activities on land areas within the study area (SCI and SSTC) are not part of the proposed action.

Briefly, the training elements involve anti-air warfare, amphibious warfare, strike warfare, anti-surface warfare, anti-submarine warfare, electronic warfare, and mine warfare activities. The testing activities involve Naval Air Systems Command Testing, Naval Sea Systems Command Testing, Space and Naval Warfare Systems Command Testing, and Office of Naval Research and Naval Research Laboratory Testing.

The project area is SOCAL Range Complex and SSTC. The SOCAL Range Complex an offshore area situated between Dana Point and San Diego, extending more than 600 nm southwest into the Pacific Ocean (Exhibit 1). The two primary components of the SOCAL Range

Complex are the OPAREAs and the special use airspace. These components encompass 120,000 square nautical miles (nmi^2) of sea space; 113,000 nmi^2 of special use airspace; and over 56 $mi.^2$ of land area.

Most of the special use airspace in the SOCAL Range Complex is defined by Warning Area 291 (W-291) (Exhibit 1), which extends vertically from the ocean surface to 80,000 ft. above mean sea level and encompasses 113,000 nm^2 of airspace. In addition to W-291, the SOCAL Range Complex includes:

• Western San Clemente OPAREA (Exhibit 3), a special use airspace extending from the surface to 5,000 ft. (1,524 m) above mean sea level.

• Helicopter Offshore Training Area (Exhibit 2), located off the coast of San Diego, and extending from the surface to 1,000 ft. (304.8 m) above mean sea level.

The SOCAL Range Complex includes approximately 120,000 nm^2 of sea and undersea space, largely defined as that ocean area underlying the Southern California special use airspace described above. The SOCAL Range Complex also extends beyond this airspace to include the surface and subsurface area from the northeastern border of W-291 to the coast of San Diego County, and includes San Diego Bay. In addition, a small part of the Point Mugu Sea Range (which is located predominantly northwest of the SOCAL Range Complex) is included in the Study Area. The Navy uses this approximately 1,000 nm^2 overlap area within the two ranges for anti-submarine warfare training conducted in the course of major range events.

The proposal also includes training and testing in ocean and bay areas at the Silver Strand Training Complex (SSTC) (Exhibit 5), as well as testing and maintenance at various Navy San Diego bay ship channels, piers and shipyards.

As will be described in the following section of this report, the Commission has previously reviewed Navy consistency determinations for training and testing in these locations. Exhibit 18, taken from the Navy's current consistency determination, identifies which activities would be within the coastal zone and compares existing and proposed activity levels. The consistency determination summarizes which of activities: (1) would be the same as those previously reviewed; (2) would be modified (i.e., different in scope, size, operation, intensity, frequency, or location); and (3) would be new. Very briefly, activities similar to previously reviewed activities would be:

- Air Combat Maneuver
- Air Defense Exercise
- Gunnery Exercise (GUNEX) (Surface-to-Air [S-A]) – Large-caliber
- GUNEX (S-A) – Medium-caliber
- Fire Support Exercise – Land-based Target
- Amphibious Assault
- Amphibious Assault – Battalion Landing
- Amphibious Raid
- Expeditionary Firing Exercise/Supporting Arms Coordination Exercise

- GUNEX (Surface-to-Surface [S-S]) Boat – Small-caliber
- Sinking Exercise
- Tracking Exercise/Torpedo Exercise (TRACKEX/TORPEX) – Surface
- Kilo Dip – Helicopter
- Electronic Warfare Operations
- Counter Targeting Flare Exercise
- Counter Targeting Chaff Exercise – Ship
- Counter Targeting Chaff Exercise – Aircraft
- Mine Countermeasure (MCM) Exercise – Surface
- Mine Neutralization – Explosive Ordnance Disposal
- MCM – Towed Mine Neutralization
- Airborne MCM – Mine Detection
- MCM – Mine Neutralization
- Mine Laying
- Marine Mammal System
- Shock Wave Action Generator
- Surf Zone Test Detachment/Equipment Test and Evaluation
- Personnel Insertion/Extraction – Submarine
- Personnel Insertion/Extraction – Non-submarine
- Underwater Demolition Multiple Charge – Mat Weave and Obstacle Loading
- Underwater Demolition Qualification/Certification
- Composite Training Unit Exercise
- Joint Task Force Exercise/Sustainment Exercise
- Integrated Anti-submarine Warfare Course
- Precision Anchoring
- Small Boat Attack
- Offshore Petroleum Discharge System
- Elevated Causeway System

Activities similar in nature to previously reviewed activities but with changes to scope, size, operation, intensity, frequency, or location, would be:

- Missile Exercise (MISSILEX) (Air-to-Air [A-A])
- MISSILEX – Man-portable Air Defense System
- Maritime Security Operations
- GUNEX (S-S) Ship – Small-caliber
- GUNEX (S-S) Ship – Medium-caliber
- GUNEX (S-S) Ship – Large-caliber
- GUNEX (Air-to-Surface [A-S]) Ship – Small-caliber
- MISSILEX (A-S)
- Bombing Exercise (A-S)
- Laser Targeting
- TRACKEX/TORPEX – Submarine
- TRACKEX/TORPEX – Helicopter
- TRACKEX/TORPEX – Maritime Patrol Aircraft
- TRACKEX/TORPEX – Maritime Patrol Advance Extended Echo Ranging Sonobuoys

- MCM Exercise – MCM Sonar – Ship Sonar
- Mine Neutralization – Remotely Operated Vehicle
- Ship Anti-submarine Warfare Readiness and Evaluation Measuring

New activities would be:

- GUNEX (A-A) – Medium-caliber
- GUNEX (S-S) Boat – Medium-caliber
- MISSILEX (S-S)
- GUNEX (A-S) – Medium-caliber
- MISSILEX (A-S) – Rocket
- Submarine Mine Exercise
- Maritime Homeland Defense/Security Mine Countermeasures
- Group Sail
- Submarine Navigation Exercise
- Submarine Under Ice Certification
- Surface Ship Sonar Maintenance
- Submarine Sonar Maintenance

The chart in Exhibit 18 which lists and compares the activities with previous levels uses the term "baseline," for existing activities levels, consistent with how the Navy defines the "No Project" or "Baseline" alternative in its Draft Environmental Impact Statement (DEIS) for the program (Hawaii-Southern California Training and Testing Draft Environmental Impact Statement/Draft Overseas Environmental Impact Statement, U.S. Department of the Navy (May 2012) (HSTT DEIS). This DEIS covers both the Navy's California and Hawaii Testing and Training Programs. Links to additional background materials, including the Navy's consistency determination, the HSTT DEIS, and NMFS' Proposed Rule for the activities, can be found on the Commission's web site at: http://www.coastal.ca.gov/fedcd/hstt/hstt.html .

B. PREVIOUS COMMISSION ACTIONS

On January 10, 2007, the Commission conditionally concurred with the Navy's consistency determination for offshore and onshore military training and testing exercises in SOCAL offshore waters (CD-086-06). The Commission's conditions, which focused primarily on the need for additional protection for marine mammals from Navy active sonar use, would (if the Navy had agreed to them) have resulted in the Navy agreeing to increase the size of the safety zones (including a shutdown zone of at least 2 km), avoid areas with high concentrations of marine mammals to the maximum extent feasible, and increase protection under low visibility and surface ducting conditions.

That Navy submittal was for activities over a two year period, ending in December 2008. Because the Navy did not agree to comply with most of the Commission's conditions, all parties were required to treat the Commission's action as an objection under the federal consistency procedures. (See 15 C.F.R. § 930.4(b).) The Navy informed the Commission it intended to proceed without agreeing to most of the conditions, and in March 2007 the Commission filed a lawsuit in federal court, the result of which is described in the following section of this report.

On October 15, 2008, the Commission conditionally concurred with a follow-up Navy consistency determination (CD-049-08) for the next round of Navy SOCAL training and testing exercises, covering the period from January 1, 2009, through December 31, 2013. The Commission adopted conditions similar to those in CD-086-06 (Exhibit 19, which contains both sets of Commission conditions). On January 16, 2009, the Navy again indicated its intent to proceed without agreeing to the conditions. By this time the U.S. Supreme Court had published its ruling in the case described below arising from the earlier training and testing, and in this instance the Commission did not file a lawsuit.

On August 10, 2010, the Commission conditionally concurred with the Navy's consistency determination (CD-033-10) for Navy training at its Silver Strand Training Complex (SSTC) in Coronado. The Navy did not agree to the Commission's conditions, which predominantly addressed onshore resources and training activities. The Commission did not challenge this Navy decision to proceed. As noted above, the Navy's current consistency determination incorporates the offshore (but not the onshore) activities at SSTC.

C. FEDERAL COURT, COUNCIL ON ENVIRONMENTAL QUALITY, AND PRESIDENTIAL ACTIONS

As noted above, litigation arose over the first of the above-described projects, with the Commission challenging the Navy under the CZMA, and environmental groups led by the Natural Resources Defense Council ("NRDC") challenging the Navy under the Marine Mammal Protection Act (MMPA), the CZMA, the National Environmental Policy Act (NEPA), and the Endangered Species Act (ESA). Over a seven-month period from mid-2007 to early 2008, the Federal District Court and Ninth Circuit Court of Appeals considered more than half-a-dozen orders, mostly related to NRDC's motion for a preliminary injunction. At the end of that period, the result of these lower court actions was the issuance of a preliminary injunction[1] requiring that the Navy comply with a set of mitigation measures, consisting of: (1) imposing a 12-mile "exclusion zone" from the coastline; (2) using lookouts to conduct additional monitoring for marine mammals; (3) restricting the use of "helicopter-dipping" sonar; (4) limiting the use of mid-frequency active (MFA) sonar in geographic "choke points"; (5) shutting down MFA sonar when a marine mammal is spotted within 2,200 yards of a vessel; and (6) powering down MFA sonar by 6 decibels (dB) during significant surface ducting conditions.

[1] "Modified Preliminary Injunction" issued on January 10, 2008, in the case of *NRDC v. Winter*, C.D. Cal. Case No. 8:07-cv-00335-FMC-FMO.

Within days following the district court's issuance of its revised injunction, the Navy: (1) sought (and received) an exemption from the President under the CZMA[2]; and (2) sought (and received) an emergency authorization from the Council on Environmental Quality ("CEQ") for "alternative NEPA arrangements"[3]. The Navy moved to vacate the district court's preliminary injunction in light of these actions, but on February 4, 2008, the district court refused to do so, and the Court of Appeals affirmed, finding, among other things, that the plaintiffs were likely to succeed on the merits of their claims, but focusing solely on the NEPA claims.

In *Winter v. Natural Res. Def. Council, Inc., 129 S. Ct. 365 (2008)*, the U.S. Supreme Court reversed the lower court rulings and vacated the preliminary injunction. The Supreme Court's ruling did not address the merits of the NEPA claims but only addressed the standard for issuance of a preliminary injunction, the application of that standard to the facts of this case, and the appropriate remedy under NEPA. The ruling did not address CZMA grounds.

D. OTHER AGENCY APPROVALS AND CONSULTATIONS

National Marine Fisheries Service (NMFS)
Pursuant to the Marine Mammal Protection Act (MMPA) (16 U.S.C. § 1371(a)(5)), the Navy has submitted a request for two Letters of Authorization (LOAs) from NMFS (one LOA for the training and one LOA for the testing) for the incidental taking of marine mammals, under the Marine Mammal Protection Act (MMPA) (the LOAs would also include species protected under the ESA). On January 31, 2013, NMFS published a proposed rule, requesting comments on its proposal to issue regulations and Letters of Authorization (LOAs) to the Navy for the proposed activities (as well as the Hawaii activities, which are not before the Commission). The public comment period remains open and ends on March 11, 2013.

U.S. Fish and Wildlife Service (USFWS)
The Navy is consulting with the U.S. Fish and Wildlife Service (USFWS) under Section 7 of the ESA for three listed seabird species under USFWS' jurisdiction.

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[2] CZMA §307(c)(1)(B) (16 U. S. C. §1456(c)(1)(B)) provides, in part:

> *After any final judgment, decree, or order of any Federal court that is appealable under section 1291 or 1292 of title 28, United States Code, or under any other applicable provision of Federal law, that a specific Federal agency activity is not in compliance with subparagraph (A), and certification by the Secretary that mediation under subsection (h) is not likely to result in such compliance, the President may, upon written request from the Secretary, exempt from compliance those elements of the Federal agency activity that are found by the Federal court to be inconsistent with an approved State program, if the President determines that the activity is in the paramount interest of the United States.*

[3] NEPA (40 CFR §1506.11) provides:

> *Where emergency circumstances make it necessary to take an action with significant environmental impact without observing the provisions of these regulations, the Federal agency taking the action should consult with the Council about alternative arrangements. Agencies and the Council will limit such arrangements to actions necessary to control the immediate impacts of the emergency. Other actions remain subject to NEPA review.*

State of Hawaii
The Navy has submitted a consistency determination to the Hawaii Coastal Zone Management Program for the portions of the training and testing located off that state.

E. MARINE RESOURCES

Coastal Act Section 30230 states:

> *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.*

Overview
The Commission has been consistent for almost two decades in expressing concerns over the effects of anthropogenic sounds on the marine environment, particularly on marine mammals. As noted in its December 13, 2005, comments to the Marine Mammal Commission's Advisory Committee on Acoustic Impacts on Marine Mammals, the Commission stated:

> *Anthropogenic noise is a recognized, but largely unregulated, form of ocean pollution that can deafen, disturb, injure, and kill marine life. Many species of marine mammals are known to be highly sensitive to sound and rely upon sound to navigate, find food, locate mates, avoid predators, and communicate with one another. A combination of noise sources, including shipping, oil and gas exploration and production, dredging, construction, and military activities, has resulted in dramatic increases in noise levels throughout the oceans. Over the last ten years, a growing body of evidence has shown that some forms of ocean noise can kill, injure, and deafen whales and other marine mammals. In particular, a sequence of marine mammal strandings and mortalities has been linked to exposure to mid-frequency sonar. There is also evidence that some affected animals do not strand but die at sea. This has increased public concern about the effects of anthropogenic noise on marine mammals, which has been acknowledged in a variety of domestic and international fora.*
>
> *Marine mammals have evolved over millions of years and rely on sound for vital life functions and have specialized sensory capabilities to take advantage of the physics of sound in the ocean. Anthropogenic noise in the oceans has increased since the start of the industrial revolution and increases in ambient noise levels, as well as individual sound sources, can cause adverse effects, the extent and type of which are not well understood. Military technology and scientific research using low frequency active acoustics attempting to cover large distances have specifically targeted the ecological sound niches that low frequency specialist whales have evolved to rely on, necessarily competing with those marine mammal species. Peer-reviewed scientific literature indicates that marine mammals are affected by exposure to anthropogenic noise in a variety of ways that can be harmful or even lethal. However, there are significant gaps in information available to understand and manage these effects. This is particularly the*

> *case because marine mammals are extremely difficult to study and the marine environment is extraordinarily complex and dynamic. In addition, this is a relatively new field of concern and the amount of research undertaken to date has been limited in scope and duration.*

In light of these concerns, during its previous two reviews of Navy SOCAL offshore testing and training, the Commission adopted conditions intended to increase protection for marine mammals, seeking, among other things, larger preclusion areas, avoidance of biologically sensitive areas, and lowering of maximum sound levels under low-visibility conditions. As noted above (pages 14-152), the Navy historically has not agreed to a number of the Commission's conditions and has maintained that its mitigation and monitoring measures are adequate to protect marine mammals (and other species). The Navy's position has been that the lack of documented population-level effects, combined with its monitoring results (reported annually), which have not documented significant adverse marine mammal reactions to its activities, support its conclusion that its activities are consistent with Section 30230 of the Coastal Act. The Commission and the Navy have also historically disagreed over the number of marine mammal species that can be considered coastal zone resources. The Navy *has* historically agreed to past Commission's requests for additional surveillance, passive and aerial monitoring, stranding reporting, and retrieval of inert mine shapes (where feasible).

The Navy's consistency determination, the full text of which can be viewed at: http://www.coastal.ca.gov/fedcd/hstt/Navy%20Consistency%20Determination%20HSTT%20for%20CA.pdf , begins with an overview of its conclusions on marine mammal effects, stating:

> *The Proposed Action includes activities that affect coastal resources. These activities include sonar activities, underwater detonations, temporary logistics-over-the-shore training activities (i.e., pile-driving), and amphibious landings in the coastal zone. Marine resources that could be affected by the Proposed Action include sensitive habitats (e.g., eelgrass and kelp), commercial and recreational fish stocks, and protected marine species (i.e., sea turtles, marine mammals, and abalones).*
>
> *Based upon the analysis provided for each resource in this section, the Navy has determined that there are no population-level impacts on any species of biological or economic significance as a result of the Proposed Action. Therefore, the Proposed Action is consistent to the maximum extent practicable with Section 30230 of the California Coastal Act.*

As a preliminary matter, the Commission finds that, by focusing on population-level impacts, the Navy misconstrued the standard for consistency with Section 30230 of the Coastal Act. As shown above, that section contains three sentences. Only the final sentence refers to uses of the marine environment needing to "maintain healthy populations of all species of marine organisms adequate for [various] purposes." Basic canons of statutory interpretation provide that the other sentences within that section must mean something more or different from that. For example, the first sentence, which requires that marine resources be "maintained, enhanced, and where feasible, restored," must be given independent meaning and significance, and cannot be reduced

to meaning nothing more than that which is also contained in the third sentence. Therefore, impacts that do not maintain, enhance, and where feasible restore, marine resources, may be inconsistent with Section 30230 regardless of whether they impose population-level impacts.

Effects

The Commission also disagrees with the Navy's assessment of what constitute coastal zone resources. The consistency determination (p. 15) acknowledges that coastal zone effects include "Coastal zone resources include both resources permanently located in the coastal zone (e.g., benthic organisms) and mobile resources (e.g., marine mammals and sea turtles) that typically move into and out of the coastal zone as part of a natural cycle."

The consistency determination (p. 48) notes that 43 marine mammal species occur within the SOCAL and Hawaii range areas, including 36 cetaceans (7 mysticetes (baleen whales) and 29 odontocetes (dolphins and toothed whales)), 6 pinnipeds (seals and sea lions), and the Southern sea otter. Nine of these species are tropical or endemic to the waters around Hawaii and are not known to occur off of California, and two (the striped dolphin and Sei whale) are thought to only occur in pelagic waters far offshore. However, of the 32 remaining species the Navy's consistency determination considers only 10 to be "coastal species" (as listed in consistency determination Table 3-7 below):

Table 3-7: Southern California Marine Mammal Species Occurrences in Coastal Zone

Common Name Species Name	SOCAL Range Complex Occurrence	Seasonal Occurrence		Coastal Zone Occurrence (√)	
		May-Oct (warm)	Nov-Apr (cold)	Resident	Occasional
Gray whale *Eschrichtius robustus*	Transient during seasonal migrations	NO	YES		√
Bottlenose dolphin coastal *Tursiops truncatus*	Limited, small population within one km of shore	YES	YES	√	
Long-beaked common dolphin *Delphinus capensis*	Common; more inshore distribution	YES	YES		√
Risso's dolphin *Grampus griseus*	Common; higher densities Nov-Apr	YES	YES		√
Pacific white-sided dolphin *Lagenorhynchus obliquidens*	Common; year round cool water species	YES	YES		√
Harbor seal *Phoca vitulina*	Common; Channel Islands haul-outs including SCI	YES	YES	√	
Northern elephant seal *Mirounga angustirostris*	Common; Channel Island haul-outs of different age classes; including SCI Dec-Mar and Apr-Aug; spend 8-10 months at sea	YES	YES	√	
California sea lion *Zalophus californianus*	Common; most common pinniped, Channel Islands breeding sites in summer	YES	YES	√	
Guadalupe fur seal *Arctocephalus townsendi*	Rare; Occasional visitor to northern Channel Islands; mainly breeds on Guadalupe Is., Mexico, May-Jul	UNK	UNK		√
Southern Sea Otter *Enhydra lutris*	Main distribution at San Nicolas Island on the northern end of the SOCAL Range Complex; translocated population of approximately 29 animals, is experimental population not considered endangered	YES	YES	√	

Note: UNK = unknown

The Navy's previous consistency determination for SOCAL Training (CD-049-08) held a similar position that only 10 species were coastal zone species. The Navy's analysis in that consistency determination indicated its position was based on whether the species occurred in the coastal zone on a "regular or cyclic" basis, and that the remaining species "… are more typically open ocean species not normally found in or near the [coastal zone]." In the above table (last column), however, the Navy appears now to be considering as coastal species those which are "occasional[ly]" present in the coastal zone. Regardless of whether the Navy is proposing a standard based on whether a species' occurrence is "regular or cyclic" or "occasional," the Commission disagrees with the Navy that only this limited number of marine mammal species is found within the coastal zone, occasionally or otherwise, and reiterates its previous findings from CD-049-08:

> *The Commission disagrees with the Navy over both which activities affect the coastal zone, as well as which species are coastal zone species. As the Commission noted in reviewing the previous Navy consistency determination for its southern California training activities:*

> *However the Commission takes a broader view than the Navy as to which activities may affect the coastal zone. Many of the species … potentially affected by the proposed training activities spend some portions of their life cycles within coastal waters….*

To support this position, during that review the Commission cited the NOAA letter dated March 10, 1995, responding to the Commission's request from the Office of Coastal Resource Management (OCRM) to review the effects of the "ATOC" sound source[4], located 48 nmi offshore of San Mateo County. In that letter NOAA affirmed that "sounds emanating from the ATOC sound source can be reasonably expected to affect marine mammals that are resources of both the outer continental shelf ("OCS") and the coastal zone…" and "OCRM has determined that the marine animals at issue that ply the waters of the coastal zone and the OCS are coastal resources."

Further support for the Commission's position that additional species – beyond the ten identified by the Navy – spend portions of their life cycle in the coastal zone is provided in Exhibits 6-7, which include the results from past NOAA oceanographic marine mammal surveys (and, for Cuvier's beaked whales, the results of Navy tracking and academic research). These surveys document the fact that virtually all of the marine mammal species identified by the Navy as present in the SOCAL area are also present within the coastal zone at some point in their life cycle, and certainly at least "occasionally." Regarding the length of time a species must be present within the coastal zone to be considered a coastal resource, the Commission is in agreement that occasional observed or recorded presence is sufficient to establish this standard. Due to the significant challenges associated with wildlife observation in the marine environment (i.e. the cost of surveys, the short period of time most species are observable at the surface, the large areas, variable climactic and weather conditions, etc.) marine mammal surveyors typically assume that the number of animals successfully observed represent a small fraction of the actual number that are likely present. As such, the Commission considers even infrequent and seemingly rare sightings of particular marine wildlife species within the coastal zone as verification of that species' status as a coastal resource.

Finally, similar to the Commission's long held position regarding effects to commercial fishing that occur in federal waters, but which affect the coastal economy, the Commission takes a comparable position that effects on whale watching, even if occurring in federal waters outside the coastal zone, should also be considered coastal zone effects, since whale watching tours are also an important segment of the California coastal economy, as well as an important component of coastal recreation. Whale watching tours regularly ply federal waters and commonly include sightings of many of the marine mammals present in the SOCAL area. For a single representative example in southern California, the Commission notes one such southern California whale watching tour which reports such sightings at http://www.newportwhales.com/whalecount.html .

[4] ATOC is the acronym for Scripps Institution of Oceanography's Acoustic Thermometry of Ocean Climate, reviewed by the Commission as Consistency Certification CC-110-94.

The consistency determination contains an Appendix A which includes details, by activity, as to whether the activity is located within the coastal zone, and the degree of proposed changes in intensity (including a comparison with baseline levels[5]). The Commission generally *agrees* with the Navy as to the *types* of activities likely to affect coastal resources. The consistency determination includes (in Appendix B) a checklist, by activity, which identifies the "stressors" that could affect each resource (e.g., sediments and water quality, marine mammals, fish and socioeconomics). The Navy states: "If a resource could be affected by a stressor, then the Proposed Action has reasonably foreseeable effects on that coastal zone resource." Based on its analysis of the stressors listed in Table 2-1 (consistency determination, p. 16) (Exhibit 8), the Navy summarizes these as follows:

> • Acoustic (sonar and other active sources, explosives, pile driving, airguns, weapons firing noise, vessel noise, aircraft noise)
>
> • Energy (electromagnetic)
>
> • Physical disturbance or strikes (vessels and in-water devices, military expended materials, seafloor devices)
>
> • Entanglement (fiber optic cables, guidance wires, and parachutes)
>
> • Ingestion (munitions and military expended material other than munitions)
>
> • Secondary stressors (changes in availability of marine resources, sediment and water quality)

In its "effects" analysis, the Navy states that the primary activities located outside the coastal zone that it considers would be reasonably likely to affect the coastal zone would be:

> *… activities using sonar (e.g., anti-submarine warfare tracking exercises and tests), activities using high-explosive ordnance (e.g., air-to-surface missile exercises and tests), mine warfare activities using high explosives (e.g., mine neutralization tests), torpedo exercises and tests, and unmanned vehicle exercises and tests.*

Acoustic Modeling and Thresholds

Specifically analyzing acoustic effects, the Navy's consistency determination (pp. 50-55) reflects a new, more complex (compared to the model used during the Commission's previous review), "Navy Acoustic Effects Model" to estimate marine mammal effects. The model predicts exposures of marine mammals before considering mitigation and marine mammal avoidance in response to the noise exposure, and then factors in additional adjustments based on mitigation it expects to be implemented and marine mammal avoidance. For what it considers the 10 coastal species, the Navy's model predicts the numbers and levels of "harassment" to coastal species shown the table (Table 3-9) below:

[5] As stated earlier, the Navy defines "baseline" to mean current levels of testing and training.

Table 3-9: Annual Exposures from Modeling Estimates of Impulsive and Non-impulsive Sources under the Proposed Action

Species	Stock	Training Exposures			Testing Exposures		
		Level B	Level A	Mortality	Level B	Level A	Mortality
Gray whale	Eastern North Pacific	9,560	2	0	2,570	1	0
Bottlenose dolphin coastal	CA/OR/WA Offshore	26,618	0	0	2,407	0	0
	California Coastal	521	0	0	769	0	0
Long-beaked common dolphin	CA/OR/WA	73,113	2	0	47,851	2	0
Risso's dolphin	CA/OR/WA	86,564	1	0	8,739	1	0
Pacific white-sided dolphin	CA/OR/WA	38,467	1	0	4,924	1	0
Harbor seal	California	5,906	11	0	892	3	0
Northern elephant seal	California Breeding	22,516	22	0	2,712	5	0
California sea lion	U.S. Stock	126,961	25	0	13,038	17	0
Guadalupe fur seal	Mexico	2,603	0	0	269	0	0
Southern sea otter	San Nicolas Island Experimental Population	0	0	0	0	0	0

Notes: CA = California; OR = Oregon; WA = Washington; U.S. = United States

Because they were generated primarily for MMPA analysis, all the tables distinguish "Level A" and "Level B" harassment categories defined under the Marine Mammal Protection Act, definitions which the Commission has historically found a useful way to categorize impacts, particularly if appropriate thresholds are used. The MMPA defines "harassment" for purposes of reviewing military readiness activities[6] as either:

> ***Level A Harassment*** - *any act that injures or has the significant potential to injure a marine mammal or marine mammal stock in the wild; or*
>
> ***Level B Harassment*** - *any act that disturbs or is likely to disturb a marine mammal or marine mammal stock in the wild by causing disruption of natural behavioral patterns, including, but not limited to, migration, surfacing, nursing, breeding, feeding, or sheltering, to a point where such behavioral patterns are abandoned or significantly altered.*

[6] Defined in Public Law 107-314 to include (1) all training and operations of the Armed Forces that relate to combat; and (2) the adequate and realistic testing of military equipment, vehicles, weapons, and sensors for proper operation and suitability for combat use.

For the reasons described above, the Commission considers the 22 of the remaining SOCAL marine mammal species to be coastal zone species.

Sub-Order or Family	Number of Species in SOCAL	Numbers Navy Finds to be Coastal Resources	Number CCC finds to be Coastal Resources
Odontocetes (toothed whales and dolphins)	21	4	20
Mysticetes (baleen whales)	7	1	6
Pinnipeds (seals and sea lions)	5	4	5
Mustelids (otters)	1	1	1
TOTAL	34	10	32

To evaluate potential impacts to the 22 species not included within the Navy's consistency determination, the Commission staff requested, and the Navy has provided, the estimates it provided to NMFS for some additional SOCAL species. However, these estimates do not include two coastal species (the southern sea otter and Guadalupe fur seal). While the occurrence of these species within the SOCAL range is expected to be low, Commission staff has been unable to evaluate potential impacts to these species. This table included below provides the impact estimates for the remaining marine mammal species[7] and also indicates (in the right-hand column) the percentage of the total number of Level B impacts shown in this table that is represented by the impacts predicted for each individual species, which boxes depicting the most predominantly affected species.

[7] The five separate species of Mesoplodon beaked whales are considered under a single heading, bottlenose dolphins are considered as separate coastal and offshore populations, and Ko~~i~~gia spp. are also included for analysis.

TRAINING

Species	SOCAL Training Alt 2 Annual Max Total Impulse, Non-Impulse, and Pile Driving/Removal			% Level B of total
	Level B	Level A	Mortal	
Blue Whale	4,145	0	0	0.3%
Fin Whale	1,528	0	0	0.1%
Humpback Whale	1,081	0	0	0.1%
Sei Whale	146	0	0	0.0%
Sperm Whale	1,958	0	0	0.1%
Guadalupe Fur Seal	2,603	0	0	0.2%
Bryde's Whale	112	0	0	0.0%
Gray Whale	9,560	2	0	0.6%
Minke Whale	359	0	0	0.0%
Baird's Beaked Whale	4,420	0	0	0.3%
Bottlenose Dolphin Coastal	521	0	0	0.0%
Bottlenose Dolphin	26,618	0	0	1.7%
Cuvier's Beaked Whale	13,353	0	0	0.9%
Dall's Porpoise	36,891	47	0	2.4%
Killer Whale	321	0	0	0.0%
Kogia spp.	12,943	33	0	0.8%
Long-beaked Common Dolphin	73,113	2	0	4.7%
Mesoplodon beaked whales	1,994	0	0	0.1%
Northern Right Whale Dolphin	51,596	1	0	3.3%
Pacific White-Sided Dolphin	38,467	1	0	2.5%
Risso's Dolphin	86,564	1	0	5.6%
Short-beaked Common Dolphin	999,282	70	3	64.6%
Short-finned Pilot Whale	308	0	0	0.0%
Striped Dolphin	3,545	0	0	0.2%
California Sea Lion	126,961	25	4	8.2%
Northern Fur Seal	20,083	5	0	1.3%
Harbor Seal	5,906	11	0	0.4%
Northern Elephant Seal	22,516	22	0	1.5%
	1,546,894	220	7	

TESTING

Species	SOCAL Testing Alt 2 Annual Max Total Impulse and Non-Impulse			
	Level B	Level A	Mortal	*% Level B of total*
Blue Whale	413	0	0	0.2%
Fin Whale	202	0	0	0.1%
Humpback Whale	101	0	0	0.0%
Sei Whale	21	0	0	0.0%
Sperm Whale	146	0	0	0.1%
Guadalupe Fur Seal	269	0	0	0.1%
Bryde's Whale	5	0	0	0.0%
Gray Whale	2,570	1	0	1.1%
Minke Whale	49	0	0	0.0%
Baird's Beaked Whale	1,045	0	0	0.5%
Bottlenose Dolphin Coastal	769	0	0	0.3%
Bottlenose Dolphin	2,407	4	0	1.1%
Cuvier's Beaked Whale	2,319	0	0	1.0%
Dall's Porpoise	5,215	32	0	2.3%
Killer Whale	53	0	0	0.0%
Kogia spp.	1,232	6	0	0.5%
Long-beaked Common Dolphin	47,851	2	0	21.2%
Mesoplodon beaked whales	345	0	0	0.2%
Northern Right Whale Dolphin	5,729	1	0	2.5%
Pacific White-Sided Dolphin	4,924	1	0	2.2%
Risso's Dolphin	8,739	1	0	3.9%
Short-beaked Common Dolphin	122,748	40	13	54.3%
Short-finned Pilot Whale	79	0	0	0.0%
Striped Dolphin	998	0	0	0.4%
California Sea Lion	13,038	17	6	5.8%
Northern Fur Seal	1,088	3	0	0.5%
Harbor Seal	892	3	0	0.4%
Northern Elephant Seal	2,712	5	0	1.2%
	225,959	116	19	

The numbers of "harassments" shown in all the above tables are significantly larger than those included in previous Navy SOCAL consistency determinations, for several reasons. The primary reason is because both the Navy and NMFS have refined the threshold levels they are using in their analyses in light of research results and studies published since the Commission's last (2008) review. Overall, the current level of scientific understanding suggests that marine mammals are more sensitive to lower sound levels than previously thought. In addition, the numbers increase because the Navy has proposed increases in several activities that it estimates would result in harassments. For example, mid-frequency sonar hours, and in particular, "MF1" Source Class, which includes the loudest of the mid-frequency sonars (e.g., AN/SQS-53 and AN/SQS-60), would increase significantly, as shown in the following table. [Note: the table includes both California and Hawaii Navy sonar use; however the Navy has stated that 95% of sonar use would occur in SOCAL. Also, No Action Alternative refers to current testing and training levels; Alternative 2 refers to the proposed levels.]:

Table 3.0-8: Training and Testing Tactical Acoustic Sources Used in the Hawaii-Southern California Training and Testing Study Area

Source Class Category	Source Class	Source Use (Annual, in Hours) for Training Activities			Source Use (Annual, in Hours) for Testing Activities		
		No Action Alternative	Alternative 1	Alternative 2	No Action Alternative	Alternative 1	Alternative 2
Low-Frequency (LF) Sources that produce signals less than 1 kHz	LF4	0	0	0	1,588	1,871	2,157
	LF5	0	0	0	840	960	1,080
	LF6	0	0	0	0	200	204
Mid-Frequency (MF) Tactical and non-tactical sources that produce signals from 1 to 10 kHz	MF1	4,454	10,382	11,534	25	129	137
	MF1K	83	88	88	0	10	10
	MF2	1,146	2,759	3,047	0	64	64
	MF2K	27	34	34	0	0	0
	MF3	898	2,133	2,133	119	340	381
	MF4	656	858	888	8	21	515
	MF5	768	1,279	1,371	121	157	427
	MF6	0	0	0	0	0	4
	MF8	0	0	0	40	32	40
	MF9	0	0	0	270	2,668	2,949
	MF10	0	0	0	0	19	20
	MF11	0	1,120	1,120	0	0	0
	MF12	255	949	1,093	0	8	12

The Navy's request for Letters of Authorization (LOA) from NMFS, pp. 138-141 (Exhibit 11), includes newer (than used during previous Commission reviews) revised thresholds, based on syntheses cited as "Nowacek et al. 2007" and "Southall et al. 2007b," as well as more recently published studies. The LOA request states:

> *Southall et al. (Southall et al. 2007b) synthesized data from many past behavioral studies and observations to determine the likelihood of behavioral reactions at specific sound levels. While in general, the louder the sound source the more intense the behavioral response, it was clear that the proximity of a sound source and the animal's experience, motivation, and conditioning were also critical factors influencing the response (Southall*

> *et al. 2007b). After examining all of the available data, the authors felt that the derivation of thresholds for behavioral response based solely on exposure level was not supported because context of the animal at the time of sound exposure was an important factor in estimating response. Nonetheless, in some conditions, consistent avoidance reactions were noted at higher sound levels depending on the marine mammal species or group allowing conclusions to be drawn. Most low-frequency cetaceans (mysticetes) observed in studies usually avoided sound sources at levels of less than or equal to 160 dB re 1 µPa. Published studies of mid-frequency cetaceans analyzed include sperm whales, belugas, bottlenose dolphins, and river dolphins. These groups showed no clear tendency, but for non-impulsive sounds, captive animals tolerated levels in excess of 170 dB re 1 µPa before showing behavioral reactions, such as avoidance, erratic swimming, and attacking the test apparatus. High-frequency cetaceans (observed from studies with harbor porpoises) exhibited changes in respiration and avoidance behavior at levels between 90 and 140 dB re 1 µPa, with profound avoidance behavior noted for levels exceeding this. Phocid seals showed avoidance reactions at or below 190 dB re 1 µPa; thus, seals may actually receive levels adequate to produce TTS before avoiding the source. Recent studies with beaked whales have shown them to be particularly sensitive to noise, with animals during three playbacks of sound breaking off foraging dives at levels below 142 dB sound pressure level, although acoustic monitoring during actual sonar exercises revealed some beaked whales continuing to forage at levels up to 157 dB sound pressure level (Tyack et al. 2011).* [Emphasis added]

Concerning recent blue whale studies, the LOA request cites Melcón et al. 2012 as indicating "Blue whales exposed to mid-frequency sonar in the Southern California Bight were less likely to produce low frequency calls usually associated with feeding behavior," and Southall et al. 2011 as indicating:

> *Preliminary results from the 2010–2011 field season of the ongoing behavioral response study in southern California waters indicated that in some cases and at low received levels, tagged blue whales responded to mid-frequency sonar but that those responses were mild and there was a quick return to their baseline activity (Southall et al. 2011).*

Summarizing recent beaked whale studies, the LOA request states:

> *From 2007 to 2011, behavioral response studies were conducted through the collaboration of various research organizations in the Bahamas, Southern California, the Mediterranean, Cape Hatteras, and Norwegian waters. These studies attempted to define and measure responses of beaked whales and other cetaceans to controlled exposures of sonar and other sounds to better understand their potential impacts. Results from the 2007–2008 study conducted near the Bahamas showed a change in diving behavior of an adult Blainville's beaked whale to playback of mid-frequency source and predator sounds (Boyd et al. 2008; Tyack et al. 2011). Reaction to mid-frequency sounds included premature cessation of clicking and termination of a foraging dive, and a slower ascent rate to the surface. Preliminary results from a similar behavioral response study in southern California waters have been presented for the 2010–2011 field season (Southall et al. 2011). Cuvier's beaked whale responses suggested particular sensitivity to sound*

exposure as consistent with results for Blainville's beaked whale. Similarly, beaked whales exposed to sonar during British training exercises stopped foraging (DSTL 2007), and preliminary results of controlled playback of sonar may indicate feeding/foraging disruption of killer whales and sperm whales (Miller et al. 2011).

Acoustic analyses also differentiate between Permanent Threshold Shift (PTS) and Temporary Threshold Shift (TTS), with PTS considered part of Level A harassment (which can also include mortality), and TTS considered part of Level B harassment (which can also include certain levels of behavioral harassment).[8] The Navy's current thresholds used in its LOA application are shown below. Table 6-1 indicates thresholds used for TTS and PTS for non-impulsive sound (which is how sonar is categorized). Table 6-2 indicates Behavioral, TTS, PTS, and Mortality thresholds and impulsive sounds and explosives. Table 6-4 indicates Level A and Level B thresholds for pile driving.

Table 6-1: Onset TTS and PTS Thresholds for Non-Impulsive Sound

Group	Species	Onset TTS	Onset PTS
Low-Frequency Cetaceans	All mysticetes	178 dB re 1µPa2-sec(LF_{II})	198 dB re 1µPa2-sec(LF_{II})
Mid-Frequency Cetaceans	Most delphinids, beaked whales, medium and large toothed whales	178 dB re 1µPa2-sec(MF_{II})	198 dB re 1µPa2-sec(MF_{II})
High-Frequency Cetaceans	Porpoises, *Kogia* spp.	152 dB re 1µPa2-sec(HF_{II})	172 dB re 1µPa2-secSEL (HF_{II})
Phocidae In-water	Harbor, Hawaiian Monk, Elephant seals	183 dB re 1µPa2-sec(P_{WI})	197 dB re 1µPa2-sec(P_{WI})
Otariidae & Obodenidae In-water	Sea lions and Fur seals	206 dB re 1µPa2-sec(O_{WI})	220 dB re 1µPa2-sec(O_{WI})
Mustelidae In-water	Sea Otters		

LF_{II}, MF_{II}, HF_{II}: New compound Type II weighting functions; P_{WI}, O_{WI}: Original Type I (Southall et al. 2007) for pinniped and mustelid in water.

[8] Southall et al. notes: "Noise-induced PTS represents tissue injury, but TTS does not. Although TTS involves reduced hearing sensitivity following exposure, it results primarily from the fatigue (as opposed to loss) of cochlear hair cells and supporting structures and is, by definition, reversible (Nordmann et al., 2000)."

Table 6-2: Impulsive Sound and Explosive Criteria and Thresholds for Predicting Physiological Effects on Marine Mammals

Group	Species	Behavior		Slight Injury			Mortality
		Behavioral (for ≥2 pulses/24 hrs)	TTS	PTS	GI Tract	Lung	
Low Frequency Cetaceans	All mysticetes	167 dB SEL (LF_{II})	172 dB SEL (LF_{II}) or 224 dB Peak SPL	187 dB SEL (LF_{II}) or 230 dB Peak SPL	237 dB SPL or 104 psi	Equation 1	Equation 2
Mid-Frequency Cetaceans	Most delphinids, medium and large toothed whales	167 dB SEL (MF_{II})	172 dB SEL (MF_{II}) or 224 dB Peak SPL	187 dB SEL (MF_{II}) or 230 dB Peak SPL			
High Frequency Cetaceans	Porpoises and *Kogia* spp.	141 dB SEL (HF_{II})	146 dB SEL (HF_{II}) or 195 dB Peak SPL	161 dB SEL (HF_{II}) or 201dB Peak SPL			
Phocidae	Hawaiian monk, elephant, and harbor seal	172 dB SEL (P_{WI})	177 dB SEL (P_{WI}) or 212 dB Peak SPL	192 dB SEL (P_{WI}) or 218 dB Peak SPL			
Otariidae	Sea lions and Fur seals	195 dB SEL (O_{WI})	200 dB SEL (O_{WI}) or 212 dB Peak SPL	215 dB SEL (O_{WI}) or 218 dB Peak SPL			
Mustelidae	Sea Otters						

(1) $-39.1M^{1/3}\left(1+\frac{D_{Rm}}{10.081}\right)^{1/2} Pa-\text{sec}$ (2) $-91.4M^{1/3}\left(1+\frac{D_{Rm}}{10.081}\right)^{1/2} Pa-\text{sec}$

M = mass of the animals in kg
Drm = depth of the receiver (animal) in meters
SEL = re 1µPa2-sec); SPL = re 1µPa

Table 6-4: Pile Driving and AirgunThresholds Used in this Analysis to Predict Effects on Marine Mammals

Species Groups	Underwater Vibratory Pile Driving Criteria (sound pressure level, dB re 1 µPa)		Underwater Impact Pile Driving and Airgun Criteria (sound pressure level, dB re 1 µPa)	
	Level B Disturbance Threshold	Level A Injury Threshold	Level B Disturbance Threshold	Level A Injury Threshold
Cetaceans (whales, dolphins, porpoises)	120 dB rms	180 dB rms	160 dB rms	180 dB rms
Pinnipeds (seals, sea lions)	120 dB rms	190 dB rms	160 dB rms	190 dB rms

rms = Root Mean Square (also RMS) and refers to 90% of the energy under the envelope.

The behavioral harassments thresholds for non-impulsive sound (including sonar) are more complex; these are depicted in Exhibit 13 (DEIS Appendix C, Criteria and Thresholds for U.S. Navy Acoustic and Explosive Effects Analysis, Table C-1). For most species, behavioral Level B harassments are shown as a function (i.e., behavioral risk function), rather than a fixed

number, with two exceptions: beaked whales, for which 140 dB is listed as the threshold, and harbor porpoises, which are not found in the SOCAL area. The Navy describes the behavioral risk function as follows:

> *The behavioral risk function predicts a probability of a substantive behavioral reaction for individuals exposed to a received sound pressure level of 120 dB re 1µPa or greater, with an increasing probability of reaction with increased received level as demonstrated in Melcón et al. (2012).*

Also, to assist in the understanding of the behavioral risk thresholds, the Navy has provided charts depicting 6 dB increments of sound and the percentages of behavioral harassments falling within each increment (LOA request, Table 6-10) (Exhibit 14). For example, the portion of the table depicted below shows, for the loudest sonar source, that approximately 83% of behavioral harassments involving both low- and mid-frequency cetaceans would occur at approximately 8.7-53.9 km from the sound source, with received level of between 156-162 dB.

Received Level	Sonar Bin MF1 (e.g., SQS-53; ASW Hull Mounted Sonar)		Sonar Bin MF4 (e.g., AQS-22; ASW Dipping Sonar)	
	Distance at Which Levels Occur Within Radius of Source (m)	Percentage of Behavioral Harassments Occurring at Given Levels	Distance at Which Levels Occur Within Radius of Source (m)	Percentage of Behavioral Harassments Occurring at Given Levels
Low Frequency Cetaceans				
120 ≤SPL <126	172,558 – 162,925	0.00%	40,000 – 40,000	0.00%
126 ≤SPL <132	162,925 – 117,783	0.00%	40,000 – 40,000	0.00%
132 ≤SPL <138	117,783 – 108,733	0.04%	40,000 – 12,975	3.03%
138 ≤SPL <144	108,733 – 77,850	1.57%	12,975 – 12,800	0.14%
144 ≤SPL <150	77,850 – 58,400	5.32%	12,800 – 6,525	27.86%
150 ≤SPL <156	58,400 – 53,942	4.70%	6,525 – 2,875	36.83%
156 ≤SPL <162	53,942 – 8,733	83.14%	2,875 – 1,088	23.78%
162 ≤SPL <168	8,733 – 4,308	3.51%	1,088 - 205	7.94%
168 ≤SPL <174	4,308 – 1,950	1.31%	205 - 105	0.32%
174 ≤SPL <180	1,950 - 850	0.33%	105 - 55	0.10%
180 ≤SPL <186	850 - 400	0.06%	55 - <50	0.01%
186 ≤SPL <192	400 - 200	0.01%	<50	0.00%
192 ≤ SPL <198	200 - 100	0.00%	<50	0.00%
Mid-Frequency Cetaceans				
120 ≤ SPL <126	172,592 – 162,933	0.00%	40,000 – 40,000	0.00%
126 ≤ SPL <132	162,933 – 124,867	0.00%	40,000 – 40,000	0.00%
132 ≤ SPL <138	124,867 – 108,742	0.07%	40,000 – 12,975	2.88%
138 ≤ SPL <144	108,742 – 78,433	1.54%	12,975 – 12,950	0.02%
144 ≤ SPL <150	78,433 – 58,650	5.41%	12,950 – 6,725	26.73%
150 ≤ SPL <156	58,650 – 53,950	4.94%	6,725 – 3,038	36.71%
156 ≤ SPL <162	53,950 – 8,925	82.62%	3,038 – 1,088	25.65%
162 ≤ SPL <168	8,925 – 4,375	3.66%	1,088 - 255	7.39%
168 ≤ SPL <174	4,375 – 1,992	1.34%	255 - 105	0.52%
174 ≤ SPL <180	1,992 - 858	0.34%	105 - 55	0.09%
180 ≤ SPL <186	858 - 408	0.06%	55 - <50	0.01%
186 ≤ SPL <192	408 - 200	0.01%	<50	0.00%
192 ≤ SPL <198	200 - 100	0.00%	<50	0.00%

ASW: anti-submarine warfare; MIW: mine warfare; m: meter; SPL: sound pressure level

Notwithstanding the fairly large numbers of Level B harassments, the Navy concludes (consistency determination, p. 54) as follows:

> ***Impacts from Sonar and Other Active Acoustical Sources***
> *The majority of predicted Level B exposures of marine mammals from sonar and other active acoustic sources are associated with major training exercises. These major training exercises are multi-day events composed of multiple, dispersed activities involving multiple platforms (i.e., vessels, aircraft, and submarines) that often require movement across or use of large areas of a range complex. Potential acoustic impacts of major training exercises, especially behavioral impacts, could be more pronounced given the duration and scale of the activity. Some animals may be exposed to this activity multiple times over the course of a few days and leave the area, although these activities do not use the same training locations day-after-day during multi-day activities. Therefore, displaced animals could return after the major training exercise moves away, allowing the animal to recover from any energy expenditure or missed resources.*
>
> *In the ocean, the use of sonar and other active acoustic sources is transient and is unlikely to repeatedly expose the same population of animals over a short period. Around heavily trafficked Navy ports and on fixed ranges, the possibility is greater for animals that are resident during all or part of the year to be exposed multiple times to sonar and other active acoustic sources. A few behavioral reactions per year, even from a single individual, are unlikely to produce long-term consequences for that individual or the population. Furthermore, mitigation measures discussed in Appendix C (Standard Operating Procedures, Mitigation, and Monitoring) would further reduce the predicted impacts.*

Dolphin Mortality from Underwater Explosives

During Navy underwater explosives testing in March 2011, in nearshore waters at the SSTC off Coronado, several dolphins died during a Navy exercise using a timed explosive. NMFS describes the event as follows:

> *During a Navy training event on March 4, 2011 at the Silver Strand Training Complex in San Diego, California, three or possibly four dolphins were killed in an explosion. During an underwater detonation training event, a pod of 100 to 150 long-beaked common dolphins were observed moving towards the 700-yd (640.1-m) exclusion zone around the explosive charge, monitored by personnel in a safety boat and participants in a dive boat. Approximately 5 minutes remained on a time-delay fuse connected to a single 8.76 lb (3.97 kg) explosive charge (C-4 and detonation cord). Although the dive boat was placed between the pod and the explosive in an effort to guide the dolphins away from the area, that effort was unsuccessful and three longbeaked common dolphins near the explosion died. In addition to the three dolphins found dead on March 4, the remains of a fourth dolphin were discovered on March 7, 2011 near Ocean Beach, California (3 days later and approximately 11.8 mi. [19 km] from Silver Strand where the training event occurred), which might also have been related to this event. Association of the fourth stranding with the training event is uncertain because dolphins strand on a*

regular basis in the San Diego area. Details such as the dolphins' depth and distance from the explosive at the time of the detonation could not be estimated from the 250 yd (228.6 m) standoff point of the observers in the dive boat or the safety boat.

These dolphin mortalities are the only known occurrence of a U.S. Navy training or testing event involving impulse energy (underwater detonation) that caused mortality or injury to a marine mammal. Despite this being a rare occurrence, the Navy has reviewed training requirements, safety procedures, and possible mitigation measures and implemented changes to reduce the potential for this to occur in the future. Discussions of procedures associated with these and other training and testing events are presented in the Mitigation section.

In response to the incident, the Navy ceased this type of testing (nationwide) until it could develop improved monitoring to further reduce the potential for such mortalities. Exhibit 15 depicts the changes the Navy has implemented, which include: (1) increased size of the area to be monitored (from 700 yds. to 1000 yds.); (2) reduced timer delay duration (from 15 mins. to 10 mins.); and (3) altering the monitoring boat movements around the charges to increase visual coverage. In response to questions from the Commission staff, the Navy states it would adversely affect training "realism" to implement what it calls "positive controls" (i.e. the ability to stop the detonation timer once initiated) for a timed delay fuse. The Navy's November 10, 2011, post incident report (to NMFS) elaborates on the safety problems that would be caused by attempting to combine positive control with timer delays:

Types of Detonation Initiating Devices

*The Navy uses both timed-delayed and positive control to initiate a particular underwater detonation depending on the training event in question (**Table 1-2**) and in particular, the training objectives applicable to that underwater detonation. The time-delay firing is called the Timed Delay Firing Device (TDFD). …*

It is not sound safety principles or good demolition practice to combine different firing circuits to a demolition charge. For instance, in a live mine field, Navy dive platoons expect there to be additional risks, such as unknown mines with different types of influence firing circuits (i.e., detonated by contact, magnetic field, or certain sounds) in close proximity to a mine they are trying to destroy. The use of a TDFD reduces these risks by limiting the possibility of an unintentionally triggering detonation from unknown mine types. Underwater demolition needs to be kept as simple and streamlined as possible, especially when divers and influence ordinance are considered. In an open ocean environment, universal use of RFDs [Radio Firing Devices] *would greatly increase the risk of misfire due to component failure, and put unnecessary stress on all needed connections and devices (adding 600 – 1,000 feet of firing wire; building/deploying and improvised, bulky, floating system for the RFD receiver; adding another 180 feet of detonating cord plus 10 feet of additional material).*

> *RFDs, therefore, are not considered a practicable alternative for all underwater detonations. While positive control devices do allow for instantaneous detonation of a charge and are used for some SSTC training events, exclusive use of RFD introduce operationally unsound tactics, thereby increasing future risks to Navy dive teams. It is essential that EOD and NSW platoons qualify annually with necessary time-delay certification, maintain proficiency, and train to face real-world scenarios that require use of TDFDs.*

The Navy's consistency determination (p.55) also reflects that the Navy has included in its LOA application to NMFS an estimated take (mortality) based on these types of potential occurrences, stating:

> *Modeling results and the record of having conducted the same or similar events for decades indicates injuries and mortality are unlikely. Given the short radii for the impact zones, range clearance procedures, and that it is unlikely for marine mammals to be in the area also suggests injuries and mortality are unlikely. Although the incident at SSTC on 4 March 2011… involving long-beaked common dolphins was an unfortunate and extremely rare incident (given that it has never occurred before), it remains extremely unlikely that a similar event involving the use of explosives in a training event would re-occur. Given this one occurrence, however, the Navy will request authorization under the MMPA for the annual incidental mortality of 26 small odontocetes (e.g., dolphins) or pinnipeds associated with Navy training and testing activities using explosives in the Study Area.*

Vessel Strikes

According to NMFS' Proposed Rule, 16 Navy vessel strikes have occurred in SOCAL over the past 20 years (1991-2010). For Navy vessel strikes in SOCAL, NMFS reports six consecutive 5-year periods with six or more whales struck (1997-2001, 1998-2002, 1999-2003, 2000-2004, 2001-2005, and 2002-2006), and no more than three whales struck in the last 5-year period from 2006-2010. No whales have been struck by Navy vessels in SOCAL since 2009. The Navy's consistency determination, p. 58, states:

> *Navy policy … is to report all whale strikes by Navy vessels. That information has been, by informal agreement, provided to National Oceanographic and Atmospheric Administration on an annual basis. Only the Navy and the U.S. Coast Guard report vessel strikes in this manner, so all statistics are skewed by a lack of comprehensive reporting by all vessels that may experience vessel strikes.*
>
> *Based on NMFS Southwest Regional Office data for Southern California, gray whales have the highest number of recorded strikes (and in all of California as well), with fin and humpback whales notably less, and blue whales the least. In the SOCAL Range Complex, the Navy has struck 16 marine mammals in a 20-year period (1991-2010) for an average of one per year (although statistically 0.8 per year [16 strikes/20 years]). In 16 of the last 20 years, there were zero to one whale strikes.*

The Navy does not anticipate ship strikes of marine mammals within the Study Area from training and testing activities under the Proposed Action. However, to account for the accidental nature of ship strikes in general, and the potential risk from any vessel movement within the Study Area, the Navy is seeking take authorization in the event a Navy ship strike does occur within the Study Area during the five-year period of NMFS' final authorization. Based on the probabilities of whale strikes suggested by the data, the Navy is requesting takes by morality or injury of 15 large marine mammals over the five years of the NMFS authorization. This level of take would be no more than four large whales in any given year.

Strandings

NMFS' Proposed Rule summarizes the available evidence linking mid-frequency military sonar to beaked whale and other marine mammal stranding events. Excerpts include:

Over the past 16 years, there have been five stranding events coincident with military mid-frequency sonar use in which exposure to sonar is believed to have been a contributing factor: Greece (1996); the Bahamas (2000); Madeira (2000); Canary Islands (2002); and Spain (2006). Additionally, in 2004, during the Rim of the Pacific (RIMPAC) exercises, between 150 and 200 usually pelagic melon-headed whales occupied the shallow waters of Hanalei Bay, Kauai, Hawaii for over 28 hours. NMFS determined that MFAS was a plausible, if not likely, contributing factor in what may have been a confluence of events that led to the stranding.

…

Several sources have published lists of mass stranding events of cetaceans in an attempt to identify relationships between those stranding events and military sonar (Hildebrand, 2004; IWC, 2005; Taylor et al., 2004). For example, based on a review of stranding records between 1960 and 1995, the International Whaling Commission (2005) identified ten mass stranding events of Cuvier's beaked whales had been reported and one mass stranding of four Baird's beaked whale. The IWC concluded that, out of eight stranding events reported from the mid- 1980s to the summer of 2003, seven had been coincident with the use of tactical mid-frequency sonar, one of those seven had been associated with the use of tactical low-frequency sonar, and the remaining stranding event had been associated with the use of seismic airguns. Most of the stranding events reviewed by the International Whaling Commission involved beaked whales. …

Naval activities (not just activities conducted by the U.S. Navy) that might have involved active sonar are reported to have coincided with nine or 10 (13 to 14 percent) of those stranding events. Between the mid-1980s and 2003 (the period reported by the International Whaling Commission), we identified reports of 44 mass cetacean stranding events of which at least seven were coincident with naval exercises that were using MFAS.

Mitigation Measures

The Navy states (consistency determination, p. 66) that while "…some activities could have temporary and local effects to California coastal zone uses and resources …, no population-level effects would be expected as a result of the Proposed Action" and that any effects would be reduced through its adherence "…to standard operating procedures and implementing environmental mitigation measures, as described in Appendix C of the Navy's Consistency Determination (Standard Operating Procedures, Mitigation, and Monitoring)." The chart below, last column, depicts the various avoidance and shutdown protocols that would be in place for the intensive active acoustic sources likely to cause Level A and B harassments:

Table 11-1: Predicted Maximum Ranges to Permanent Threshold Shift and Recommended Buffer Zones

Activity Category	Representative Source (Bin)*	Predicted Average Range to TTS	Predicted Average Range to PTS	Predicted Maximum Range to PTS	Recommended Mitigation Zone
Non-Impulsive Sound					
Low-Frequency and Hull-Mounted Mid-Frequency Active Sonar	SQS-53 ASW hull-mounted sonar (MF1)	4,251 yd. (3,887 m)	281 yd. (257 m)	<292 yd. (<267 m)	6 dB power down at 1,000 yd. (914 m); 4 dB power down at 500 yd. (457 m); and shutdown at 200 yd. (183 m)
High-Frequency and Non-Hull Mounted Mid-Frequency Active Sonar	AQS-22 ASW dipping sonar (MF4)	226 yd. (207 m)	<55 yd. (<50 m)	<55 yd. (<50 m)	200 yd. (183 m)
Explosive and Impulsive Sound					
Improved Extended Echo Ranging Sonobuoys	Explosive sonobuoy (E4)	434 yd. (397 m)	156 yd. (143 m)	563 yd. (515 m)	600 yd. (549 m)
Explosive Sonobuoys using 0.6–2.5 lb. NEW	Explosive sonobuoy (E3)	290 yd. (265 m)	113 yd. (103 m)	309 yd. (283 m)	350 yd. (320 m)
Anti-Swimmer Grenades	Up to 0.5 lb. NEW (E2)	190 yd. (174 m)	83 yd. (76 m)	182 yd. (167 m)	200 yd. (183 m)
Mine Countermeasure and Neutralization Activities Using Positive Control Firing Devices	NEW dependent (see Table 5.3-3)				
Mine Neutralization Diver Placed Mines Using Time-Delay Firing Devices	Up to 20 lb. NEW (E6)	647 yd. (592 m)	232 yd. (212 m)	469 yd. (429 m)	1,000 yd. (915 m)
Ordnance Testing (Line Charge Testing)	Numerous 5 lb. charges (E4)	434 yd. (397 m)	156 yd. (143 m)	563 yd. (515 m)	900 yd. (823 m)**
Gunnery Exercises – Small- and Medium-Caliber (Surface Target)	40 mm projectile (E2)	190 yd. (174 m)	83 yd. (76 m)	182 yd. (167 m)	200 yd. (183 m)
Gunnery Exercises – Large-Caliber (Surface Target)	5 in. projectiles (E5 at the surface***)	453 yd. (414 m)	186 yd. (170 m)	526 yd. (481 m)	600 yd. (549 m)
Missile Exercises up to 250 lb. NEW (Surface Target)	Maverick missile (E9)	949 yd. (868 m)	398 yd. (364 m)	699 yd. (639 m)	900 yd. (823 m)
Missile Exercises up to 500 lb. NEW (Surface Target)	Harpoon missile (E10)	1,832 yd. (1,675 m)	731 yd. (668 m)	1,883 yd. (1,721 m)	2,000 yd. (1.8 km)
Bombing Exercises	MK-84 2,000 lb. bomb (E12)	2,513 yd. (2.3 km)	991 yd. (906 m)	2,474 yd. (2.3 km)	2,500 yd. (2.3 km)**
Torpedo (Explosive) Testing	MK-48 torpedo (E11)	1,632 yd. (1.5 km)	697 yd. (637 m)	2,021 yd. (1.8 km)	2,100 yd. (1.9 km)
Sinking Exercises	Various sources up to the MK-84 2,000 lb. bomb (E12)	2,513 yd. (2.3 km)	991 yd. (906 m)	2,474 yd. (2.3 km)	2.5 nm
At-Sea Explosive Testing	Various sources less than 10 lb. NEW (E5 at various depths***)	525 yd. (480 m)	204 yd. (187 m)	649 yd. (593 m)	1,600 yd. (1.4 km)**
Elevated Causeway System – Pile Driving	24 in. steel impact hammer	1,094 yd. (1,000 m)	51 yd. (46 m)	51 yd. (46 m)	60 yd. (55 m)

ASW: anti-submarine warfare; JAX: Jacksonville; NEW: net explosive weight; PTS: permanent threshold shift; TTS: temporary threshold shift;
* This table does not provide an inclusive list of source bins; bins presented here represent the source bin with the largest range to effects within the given activity category.
** Recommended mitigation zones are larger than the modeled injury zones to account for multiple types of sources or charges being used.
*** The representative source bin E5 has different range to effects depending on the depth of activity occurrence (at the surface or at various depths).

Sea Turtles and Other Marine Species

Concerning potential effects to the five sea turtle species in the project area (all listed as endangered under the ESA), the Navy predicts impacts to only one species, the green sea turtle [*Chelonia mydas*]. Based on its modeling the Navy predicts its testing (with no effects resulting

from training) would generate the following TTS and PTS "takes" under the MMPA (Table 3-3, Navy consistency determination, p. 22):

Table 3-3: Total Annual Model-Predicted Impacts on Sea Turtles of Testing Activities using Sonar or Other Active Non-Impulsive Acoustic Sources in the Study Area

Sea Turtle Species	Baseline		Proposed Action	
	Temporary Threshold Shift	Permanent Threshold Shift	Temporary Threshold Shift	Permanent Threshold Shift
Green sea turtle	549	119	616	97

Notes: The timing, locations, and numbers of these activities would not substantially differ from year to year under each alternative.

At the same time, the Navy's consistency determination states (p. 23) that sea turtle impacts would be minimal for the following reasons:

> *Because model-predicted impacts are conservative and most impacts would be short-term, potential impacts are not expected to result in substantial changes in behavior, growth, survival, annual reproductive success, lifetime reproductive success (fitness), or species recruitment. Although some individuals could experience long-term impacts, population-level impacts are not expected. The predicted impacts do not account for avoidance behavior at close range or for high sound levels approaching those that could cause a permanent threshold shift (PTS). Furthermore, cues preceding the event (e.g., vessel presence and movement, aircraft overflight) may cause some animals to leave the area before active sound sources begin transmitting. Avoidance behavior could reduce the sound exposure level experienced by a sea turtle, and therefore reduce the likelihood and degree of PTS and TTS predicted near sound sources. In addition, PTS and TTS threshold criteria for sea turtles are conservatively based on criteria developed for mid-frequency marine mammals. Therefore, actual PTS and TTS impacts are expected to be substantially less than the predicted quantities.*

Concerning effects on sea turtles from other stressors (i.e., explosives, pile driving (which includes monitoring and avoiding effects on sea turtles), swimmer defense airguns, weapons firing, vessels and vessel noise, aircraft noise, disposal of parachutes, and other activities), the Navy states that risks would be low, with no long-term or population level impacts (consistency determination, pp. 22-30.

The Navy also anticipates that impacts would be low to sensitive marine vegetative habitats (e.g., kelp beds), seabirds (including several listed species), and commercial and recreational fish stocks to be low, with no long-term or population level impacts (consistency determination pp. 30-45).

Monitoring

NMFS (Proposed Rule, FR 1/31/13, pp. 7108-7109) (Exhibit 12) summarizes past Navy monitoring efforts in SOCAL and Hawaii. NMFS reports that the Navy has taken "significant initiative" in developing its marine species monitoring program, and has made "considerable progress toward reaching goals and objectives of …" an Integrated Comprehensive Monitoring Program (ICMP). NMFS states the on-board watchstanders information is "generally useful to indicate the presence or absence of marine mammals within the mitigation zones (and sometimes beyond)" but that it "… does not provide useful species-specific information or behavioral data." Although somewhat equivocal, NMFS states:

> *Though it is by no means conclusive, it is worth noting that no instances of obvious behavioral disturbance have been observed by Navy watchstanders or experienced marine mammal observers conducting visual monitoring.*

NMFS also states that while the observations do provide useful and valuable information, it cannot be relied upon for a thorough understanding of the overall distributions and abundance of marine mammals. NMFS therefore states:

> *NMFS and the Navy should more carefully consider what and how information should be gathered by watchstanders during training exercises and monitoring events, as some reports contain different information, making cross-report comparisons difficult.*

NMFS further notes that the Navy has:

- *Conducted over 4,000 hours of visual survey effort;*
- *Covered over 64,800 nautical miles of ocean;*
- *Sighted over 256,000 individual marine mammals;*
- *Taken over 45,500 digital photos and 32 hours of digital video;*
- *Attached 70 satellite tracking tags to individual marine mammals; and*
- *Collected over 25,000 hours of passive acoustic recordings.*

NMFS concludes, concerning past monitoring:

> *Data collection and analysis within these range complexes is ongoing. From 2009 to 2011, Navy lookouts aboard Navy ships reported 1,262 sightings for an estimated 12,875 marine mammals within the HSTT Study Area. These observations were mainly during major at-sea training events and there were no reported observations of adverse reactions by marine mammals and no dead or injured animals reported associated with Navy training activities.*

NMFS' (Proposed Rule, FR 1/31/13, pp. 7018-7019) also describes extensive future Navy integrated monitoring programs, which will include, in concert with NMFS, development of adaptive management strategy, modifications to mitigation measures if warranted, and the continuing extensive Navy- funded research efforts which benefit the understanding of the marine environment in general and the effects of sound on it. NMFS notes:

> *From 2004 to 2012, the Navy has provided over $230 million for marine species research. The Navy sponsors 70 percent of all U.S. research concerning the effects of human-generated sound on marine mammals and 50 percent of such research conducted worldwide.*

NMFS Tentative Conclusion
In its Proposed Rule (FR 1/31/13, p. 7040) for the combined California and Hawaii Programs (i.e., it provides one conclusion covering both programs), and which is currently open for public comment, NMFS has issued the following preliminary determination:

> *Based on the analysis contained herein of the likely effects of the specified activity on marine mammals and their habitat and dependent upon the implementation of the mitigation and monitoring measures, NMFS preliminarily finds that the total taking from Navy training and testing exercises in the HSTT Study Area will have a negligible impact on the affected species or stocks. NMFS has proposed regulations for these exercises that prescribe the means of effecting the least practicable adverse impact on marine mammals and their habitat and set forth requirements pertaining to the monitoring and reporting of that taking.*

Navy Conclusion
In its application to NMFS, the Navy states, for the entire HSTT program (LOA request, p. 148):

> *Based on this research, monitoring before, during, and after training and testing events since 2006, and the reports that have been submitted to and reviewed by NMFS, the Navy's assessment is that it is unlikely there will be impacts to populations of marine mammals (such as whales, dolphins and porpoise, seals and sea lions) having any long term consequences as a result of the proposed continuation of training and testing in the ocean areas historically used by the Navy.*
>
> *This assessment of likelihood is based on four indicators from areas in the Pacific where Navy training and testing has been ongoing for decades; (1) evidence suggesting or documenting increases in the numbers of marine mammals present; (2) examples of documented presence and site fidelity of species and long-term residence by individual animals of some species; (3) use of training and testing areas for breeding and nursing activities; and (4) six years of comprehensive monitoring data indicating a lack of any observable effects to marine mammal populations as a result of Navy training and testing activities. Citations to evidence indicative of increases and/or viability of marine mammal populations are not meant to suggest that Navy training and testing events are beneficial to marine mammals. There is, however, no direct evidence from HRC or SOCAL suggesting Navy training and testing has had or may have any long term consequences to marine mammals and therefore baring any evidence to the contrary, what limited and preliminary evidence there is should be considered. This is especially the case given the widespread public misperception that Navy training and testing, especially involving use of mid-frequency sonar, will cause countless numbers of marine mammals to be injured or die. Examples to the contrary where the Navy has conducted training and testing activities for decades include the following.*
>
> *Work by Moore and Barlow (2011) indicate that since 1991, there is strong evidence of increasing fin whale abundance in the California Current area, which includes the SOCAL Range Complex. They predict continued increases in fin whale numbers over the*

next decade, and that perhaps fin whale densities are reaching "current ecosystem limits".

…

In SOCAL, based on a series of surveys from 2006 to 2008 and the high number encounter rate, Falcone et al. (2009) proposed that their observations suggested the ocean basin west of San Clemente Island may be an important region for Cuvier's beaked whales. For over three decades, the ocean area west of San Clemente has been the location of the Navy's instrumented training range and is one of the most intensively used training and testing areas in the Pacific, given the proximity to the Naval installations in San Diego.

To reiterate, while the evidence is limited to a few species and only suggestive of the general viability of those species, there is no direct evidence that routine Navy training and testing spanning decades has negatively impacted those species. Therefore, based on the best available science, Navy believes that long-term consequences for individuals or populations are unlikely to result from Navy training and testing activities.

In its consistency determination, the Navy concludes, for the California portion of the program:

The Navy conducted an effects test to analyze how and to what degree the Proposed Action would affect California coastal zone uses and resources, as defined in the applicable, enforceable policies. Results of the effects test, which considered training and testing activities that could occur within the coastal zone and activities that occur outside the coastal zone but could affect coastal zone resources, indicate that some activities could have temporary and local effects to California coastal zone uses and resources. Although some individual biological organisms may be affected, no population-level effects would be expected as a result of the Proposed Action. The Navy would reduce the potential impacts of its proposed activities on coastal zone uses and resources by adhering to standard operating procedures and implementing environmental mitigation measures, as described in Appendix C of this Consistency Determination (Standard Operating Procedures, Mitigation, and Monitoring).

In addition, the Navy is consulting with NMFS for ESA-listed marine mammals, sea turtles, steelhead trout, and abalones, and informally with USFWS for ESA-listed seabirds. The Navy anticipates their concurrence on its Not Likely to Adversely Affect determinations for black abalone, white abalone, and steelhead trout, as well as for designated critical habitat for black abalone and steelhead trout.

Therefore, the Navy is consistent to the maximum extent practicable with the enforceable policies of the California Coastal Management Program.

Commission Conclusion

As discussed on pages 1~~86~~-2~~18~~ above, the Commission disagrees with the Navy's assumption that only 10 marine mammal species are coastal zone species. The Commission also disagrees with the Navy that a conclusion can be made that the current level of activities, much less the significant increases proposed for California, would not have population-level effects, for several reasons. First, for all the populations of affected marine mammals, it is simply impossible to establish whether population level effects have been occurring, or would occur with the increased levels, given that the Navy has been using this technology in this area consistently for the past 40 years. As the study discussed below notes: "High densities are not obviously consistent with a hypothesis that declines are due to military sonar, but they do not refute the possibility that declines have occurred in these areas (i.e., that densities were previously even higher)."

Second, the recently-published study from which the above quote was taken, "Declining Abundance of Beaked Whales (Family Ziphiidae) in the California Current Large Marine Ecosystem" (Moore and Barlow, January 2013), poses a hypothesis that military sonar *could* be resulting in potential population-level effects for several species of beaked whales, which are the SOCAL species *most* sensitive to mid-frequency sonar, *most* likely to incur mortalities by stranding, and *most* difficult to detect by on-board observers. According to the Navy's information (Table 6-10 – Exhibit 14), the distance to the behavioral reaction threshold level for beaked whales (i.e., 140 dB Received Level) would be in the 80-100 km range, which is an area clearly impossible for on-board watchstanders to observe. The abstract of this Moore and Barlow study states that the existing data "… provide strong evidence of declining beaked whale abundance in the study area," which consists of the eastern Pacific (i.e., off the coasts of California, Oregon, and Washington). The study examines three potential hypotheses to explain such declines: (1) mortality from fishing; (2) Navy sonar and other anthropogenic noise; and (3) ecosystem change. The study rules out mortality from fishing as an "unlikely" cause, due to low bycatch rates. The study acknowledges the previously-discussed known links between beaked whale strandings and military sonar, but states that:

> *Although the threats from naval acoustic activity have been described, population-level impacts have not been quantified. Mass strandings of beaked whales throughout the Northern Hemisphere have been associated with offshore military activity, but estimates of total mortality associated with these types of impacts do not exist. Certainly they exceed levels that have been recorded, however, since the probability of observing dead whales is generally low, especially for deep-water species [46]–[48].*

The study goes on to say that the "…evidence to implicate noise from naval activity or other acoustic sources as a cause of apparent beaked whale declines in the California Current is equivocal," and, therefore, that insufficient data are available to make definitive conclusions. The study notes the high densities of beaked whales at the Navy training range SOAR. But it states, again, that:

> *High densities are not obviously consistent with a hypothesis that declines are due to military sonar, but they do not refute the possibility that declines have occurred in these areas (i.e., that densities were previously even higher). Navy ranges occurring in high-quality beaked whale habitat could also act as population sinks where sonar-habituated adults persist but recruitment is compromised through direct or indirect mechanisms. Disproportionately high frequencies of immature animals occurring in mass stranding events associated with anthropogenic activities [55] provide some albeit inconclusive support of this hypothesis. Densities of M. densirostris in the Abaco Island area, 100 km north of the AUTEC range, appear to have remained stable from 1998–2011 [56], suggesting that, at least for this species in the Bahamas region, any potential negative effects of navy sonar may have a limited geographic reach. However, major differences in deepwater canyon bathymetry and spatial dynamics of naval operations between AUTEC and SOAR (e.g., active sonar operations in the Southern California Bight can occur well outside of SOAR) make it difficult to extend inference for Mesoplodon in the Bahamas to Mesoplodon and Z. cavirostris in the California Current.*

Concerning the third hypothesis posed, the study again concludes that data are lacking to enable assessment of the impacts of ecosystem change (and trophic dynamics) and recommends additional research, stating:

> ***Summary and research recommendations***
>
> *The abundance of Ziphius and especially Mesoplodon beaked whales appears to have declined in the California Current since the early 1990s. This inference was made possible through a Bayesian hierarchical modeling approach. Drivers of apparent population declines are unknown, although direct fisheries (bycatch) impacts can probably be ruled out. Impacts from anthropogenic noise and human-mediated or other ecosystem change are plausible explanations, but additional research is required to more thoroughly evaluate these hypotheses.*
>
> *Dedicated survey effort to estimate trends in the Navy SOAR area of the Southern California Bight and in additional control areas would help test hypotheses concerning the effects of naval sonar on trends. Comparisons of population age structure based on mark-resight data would also be insightful, while data on individual movement patterns would provide complementary information about the potential geographic reach of local impacts at SOAR to other areas of the system.*

Even if the Navy's conclusion *were* supportable concerning a lack of population-level effects, the Commission notes that it is only one of the tests of Section 30230. The Commission finds, as it did in 2008, that compliance with Section 30230 also requires enhancement (and where feasible restoration) of the overall marine environment, as well as special protection for areas and species of special biological or economic significance. These requirements have led the Commission to previously determine that they require the avoidance of the use of very loud active acoustics in biologically important and sensitive areas, in particular areas of high, or seasonally high, concentrations of marine mammals. The fact that the Navy is proposing to significantly increase the levels of activities likely to cause harm to the marine mammals,

combined with the beaked whale and blue whale research results discussed above that have been published since the Commission's last review, which confirmed the Commission's belief that lower thresholds were appropriate (and which the Navy and NMFS have now acknowledged)), only confirm the concerns the Commission has historically raised ~~over the need for additional restrictions~~.

Moreover, the Navy's purported conclusion, based on its monitoring, of a "lack of observable effects" is unconvincing and is contradicted by more scientific studies designed to more comprehensively measure marine mammal reactions to military sonar and military-like sonar sounds. These research efforts have been intentionally conducted in areas where the Navy trains such as SOCAL and the Bahamas (at Atlantic Undersea Test and Evaluation Center (AUTEC). To date (and the research efforts are continuing), the studies (such as those discussed on pages 2~~8~~4-29~~6~~ above) have documented marine mammal reactions at sound levels far below the exposures the louder sources would generate. In addition, the notes that the Navy's own model inherently *assumes* mammal avoidance responses, when in the final application of mitigation measures to the "take" estimates it assumes most Permanent Threshold Shifts will be reduced to Temporary Threshold Shits, based on the assumption that animals will hear the sound and move away from the source. If animals are moving away from the source while engaged in biologically significant behaviors such as feeding or mating, then those reactions would in and of themselves be considered overt adverse reactions caused by the sonar. Therefore, the Commission is even more convinced than it was five years ago by the currently available data that that the Navy needs to consider and analyze such alternatives as additional avoidance, monitoring, and mitigation measures, before the Commission could determine ~~are necessary to enable it to find~~whether the proposed increased training and testing measures would be consistent with the requirements of Section 30230.

In sum, the Commission does not believe that the Navy has demonstrated that the proposed activity with have no population-level effects. However, even if this could be demonstrated, population-level effects are only part of the analysis. Looking at impacts more generally, and even hypothetically limiting the analysis to the ten species that the Navy determines are coastal resources, and using its own data estimates, that data demonstrates a significant negative impact on coastal resources, in the form of 477,000 Level B annual harassment, and 94 Level A annual harassments (with no mortalities). Under the Commission's interpretation of coastal species, the numbers would increase to 1.78 million Level B annual harassments and 336 Level A annual harassments (and up to 26 mortalities). Under either estimate, the Commission does not have sufficient information to determine that the activity would ~~not~~ maintain, enhance, or restored marine resources. The Commission also notes that the Navy has not provided the type of population-level analysis Pacific Gas and Electric Company (PG&E) had provided in its high energy seismic survey consistency certification (CC-027-12) (described on the following page (Item No. 3)~~, and would be inconsistent with 30230~~. Moreover, the Navy's own data indicate that some additional species are in the coastal zone "occasionally," and thus, by its own approach, more species would need to be considered, heightening the evidence of inconsistency. ~~When looking at all of the species that the Coastal Commission considers to be coastal resources, this conclusion is even clearer.~~

In conclusion, the Commission finds that the Navy's consistency determination lacks sufficient information to enable it to determine consistency with the marine resource policy (Section 30230) for the following reasons:

1) The Navy's analysis relied on an incomplete analysis of the requirements of Section 30230, in that it only looked at one of the three tests (population-level effects), ignoring requirements of Section 30230 for the maintenance, enhancement, and, where feasible, restoration, of the overall marine environment, as well as for providing special protection for areas and species of special biological or economic significance.

2) The Navy arbitrarily limited its analysis to only 10 of the 34 marine mammals present in the southern California study area, when the preponderance of the evidence is that 32 of the 34 species are present in the coastal zone.

3) Even the Navy's population level effects analysis was questionable, as it was not supported by substantial evidence. Moreover, it did not include the type of analysis typically supplied in current-day marine mammal population analyses to estimate whether a proposed activity could result in marine mammal stocks falling below their optimal sustainable population levels, which was included in the analysis the Commission relied on in its recent review of the Pacific Gas and Electric Company's high energy seismic survey, and which compared "Level A takes" (under the Marine Mammal Protection Act) against residual "Potential Biological Removal" rates, and "Level B takes" for listed species against minimum population estimates.

4) The Navy provided no explanation as to why significant intensification of use of mid-frequency sonar was needed for military training and testing (e.g., an increase in "MF-1" sonar use (the loudest of the sonars) from 4,454 to 11,534 hours per year).

5) The Navy failed to analyze and consider alternatives such as implementing "time-area" closures, as well as other mitigation measures previously adopted by the Commission in reviewing past Navy consistency determinations for Southern California Training and Testing (CD-086-06 and CD-049-08), measures which the Commission staff requested the Navy to analyze in its July 10, 2012, comments on the HSTT DEIS.

Further support for this last point can be found in the January 9, 2010, letter from former NOAA Administrator Jane Lubchenco (sent to Council on Environmental Quality Chair Nancy Sutley), which, among other things, urges consideration of "time-area closures" and "new approaches" by the Navy (Exhibit 21).

Without the above information, the Commission finds it is unable to determine whether feasible less damaging alternatives are available that would lessen adverse effects on marine resources, and whether the Program would be carried out: (a) in a manner that maintains, enhances, and, where feasible, restores marine resources; and (b) in a manner that provides special protection to areas of special biological or economic significance.

~~Accordingly, in order to bring the activities into consistency with the Coastal Act, the Commission concludes that, in order to find the activities with Section 30230, conditions are needed to: (1) establish larger shutdown areas (up to 2 km) when marine mammals or other species are detected; (2) avoid use of mid-frequency sonar in sensitive areas, which would include Marine Protected Areas and Marine Sanctuaries, seasonal blue and gray whale areas and migration corridors, nearshore areas, and any biologically sensitive area NMFS may designate at a future date; (3) reduce sound under low-visibility conditions; (4) limit typical vessel speeds in sensitive areas to 10 knots (unless higher speeds are necessary for training); (5) improve observer effectiveness training; and (6) implement a contingency plan for use of nearshore explosives, if mortalities recur.~~

Finally, the Commission notes that: (1) the Navy's refusal to consider avoiding state- and federally-designated Marine Protected Areas (MPAs) would undermine significant state and federal efforts establishing the MPAs, by potentially compromising the collection of accurate MPA baseline studies; and (2) during its recent review of Pacific Gas and Electric's consistency certification for the Diablo Canyon Nuclear Power Plant seismic survey (CC-027-12), the Commission determined, as it is determining here, that MPA's are among the habitats afforded "special protection" under the requirements of Section 30230.

~~Finally, to avoid incidents comparable to the March 2011 dolphin mortality, the Commission urges the Navy to improve the safety of the technology and work on developing positive control mechanisms that could be used on timer delay explosives training. The Commission acknowledges that the incident was a rare event and the Navy has improved its mitigation measures for this contingency, but if one more comparable incident occurs, the Commission finds the Navy will need to either provide fail-safe technology, or, at a minimum, commit to aerial monitoring (such as with helicopters) to be included for all such future training using timed explosives. Condition 6 spells out this contingency.~~

~~To conclude, to be consistent with the applicable marine resource protection Coastal Act policies, the Navy would need to modify the activities to implement the conditions contained on pages 6-7 of this report. The Commission concludes that, only as conditioned to include these measures, would the proposed training exercises and other activities be consistent with the applicable marine resource protection policy (Section 30230) of the Coastal Act.~~

~~As provided in 15 CFR § 930.4(b), in the event the Navy does not agree with the Commission's conditions of concurrence, then all parties shall treat this conditional concurrence as an objection.~~

F. COMMERCIAL AND RECREATIONAL FISHING

In addition to the commercial fishing protection afforded under Section 30230 (quoted above on page 1~~7~~4), Sections 30234 and 30234.5 state:

> **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.*

Concerning commercial fishing, the Navy's consistency determination notes that the SOCAL Range Complex supports numerous groundfishes (e.g., flatfishes, skates, sharks, chimeras, rockfishes) that ~~area~~ are important recreational and commercial species, as well as extensive pelagic species including anchovies, mackerel, sardines, and squid. The Navy notes that the harvest of coastal pelagic species is one of the largest fisheries in the SOCAL Range Complex in terms of landed biomass, volume, and revenue, and that in 2010, California ranked fourth in the nation for commercial fisheries landings (measured in pounds). For recreational fisheries, the Navy notes California ranked 14th in the nation in landings of finfish (bony and cartilaginous fish that use fins for locomotion). The Navy states:

> *The Navy has performed military activities within this region in the past, and has not barred fishing or recreational uses. Navy ships, fishermen, and recreational users operate within the area together, and keep a safe distance between each other. Navy exercise participants relocate as necessary to avoid conflicts with nonparticipants. Only specific areas within SOCAL Range Complex have been designated as danger zones or restricted areas. In addition to these areas, the Navy may temporarily establish an exclusion zone for the duration of a specific activity (e.g., an activity involving the detonation of explosives) to prevent non-participating vessels and aircraft from entering an unsafe area. Exclusion zones typically have a radius of only a couple of miles (this varies depending on the activity), are surveyed before, during, and after the activity takes place, and end after the activity is completed. Should the Navy find nonparticipants present in an exclusion zone, the Navy would halt or delay (and reschedule, if necessary) all potentially hazardous activity until the nonparticipants have exited the exclusion zone. Upon completion of training, the range would be reopened and fishermen would be able to return to fish in the previously closed area. To help manage competing demands and maintain public access in the Study Area, the Navy conducts its offshore operations in a manner that minimizes restrictions on commercial fisherman.*

The Navy states that temporary range clearances it implements "… do not adversely affect commercial and recreational fishing activities because displacement is of short duration (hours)," and when they are implemented, the Navy requests U.S. Coast Guard notices to mariners (NOTMARs) to warn the public of upcoming Navy activities. The NOTMARs and postings on Navy websites are intended to prevent fishermen from expending time and fuel resources k Further, in 2009 the Navy conducted a study to assess the effects of Navy activities on commercial and recreational fishing in SOCAL, which include surveying of local fishermen, and identifying several recommendations to improve communications. This study, entitled ("Southern California (SOCAL) Fisheries Study: Catch Statistics (2002-2007), Fishing Access, and Fishermen Perception," February 2009), concludes with five recommendations for improved communications efforts (Exhibit 16). The study indicates the Navy would consider the

recommendations, which it acknowledges "also could benefit the Navy as it would limit potential military/civilian interactions and delays in Navy training activities, as well as improve the perception of the Navy by the fishing community in these shared waters. The recommendations are:

Surveyed Fishermen's Recommendations:

• Regular broadcasted announcements on VHF Channel 16 or the addition of a hotline number that is updated every four hours would reach a greater percentage of the fishing population and allow fishermen to plan their fishing trips in a manner that is more cost and time efficient and less intrusive to Navy training activities.

• More frequent updates to the SCI schedule of operations website would prevent unnecessary and costly trips for fishermen, as well as help the Navy to more easily acquire necessary clearance for the training operations. The addition of a legend for Navy abbreviations/nomenclature and activity types within the schedule of operations webpage would prevent confusion among users and would make it easier for first time users of the website to understand the schedule.

• The addition of a single POC at SCI Fleet Control that has the most updated schedule information for the SCI website would give fishermen who do not utilize the internet a reliable source to contact for regarding the schedule and associated closures.

• The addition of a cellular phone tower at the southern end of SCI would allow fishermen who do not have satellite phones to call SCI Security if they had questions regarding the schedule once they have left the mainland. This also would improve overall communication between the fishermen and SCI Security in the southern end of SCI.

• Not all Navy training activities occur in the waters surrounding SCI. Clarification of whether a Navy activity requires a closure to fishing grounds or if fishing is still permitted despite the operations would allow fishermen to fish in areas that they may perceive as closed when, in fact, they are open for use.

The last page of the study indicates at least partial implementation, as follows:

During the course of the study, some of the recommendations have already been addressed by SCORE [Southern California Offshore Range].In particular, the initiation of development of a more robust SCORE range control, which will allow fishermen to contact the SCI Range in realtime using marine band radio (VHF) or cellular phones to obtain the status of OPAREA availability. In addition, a list of OPAREA and altitude acronyms/codes was generated and posted as a link on the main page of the SCI website (http://www.scisland.org/temp/acronyms.php) which, along with other user-friendly website implementations (i.e., "Tool Tips"), is in the process of being added to the SCI website. Once developed, when a user clicks on an OPAREA within Tool Tips, information with respect to a particular area and color coordination between the area on

> *the map and the record listed will be displayed. The Navy will continue to review the remainder of the fishermen's recommendations and determine which are feasible to implement without compromising the critical training activities at the SCI Range Complex.*

Concerning the proposed SOCAL Training and Testing, the Navy's conclusion concerning effects on commercial and recreational fishing is as follows:

> *The Navy has been conducting training and testing activities within the coastal zone for decades, and has taken and will continue to take measures to prevent interruption of commercial and recreational fishing activities. Fishing activities would not be permanently inhibited by Navy activities. The Navy would require exclusive use of portions of nearshore waters for short durations (hours), but training and testing areas would be small. The Navy has conducted training and testing activities in the past, with little to no adverse effects on commercial or recreational fishing. Thus, the Proposed Action would be consistent to the maximum extent practicable with Section 30234.5 of the California Coastal Act.*

The Commission believes it is incumbent on the Navy to follow through on the above commitments to consider improved communications with the fishing community. In addition to the information deficiencies identified in the previous section of this report, the Commission finds that the Navy's consistency determination lacks sufficient information to enable the Commission to determine consistency with the commercial fishing policies (Sections 30230, 30234, and 30234.5) of the Coastal Act, because the Navy has not explained why it is unwilling to consider implementing its own 2009 commercial fishing survey recommendations to improve communications with the commercial fishing industry.

~~In order to find the proposed activities consistent with the commercial and recreational fishing policies, the Commission therefore finds a condition is needed to hold the Navy to these commitments to reduce, where feasible, use conflicts with the fishing industry. The condition (page 7) would require the Navy to implement each of the above recommendations or provide an explanation to the Commission within a reasonable period of time as to why the Navy considers implementation infeasible. The Commission concludes that, only as conditioned to include these measures, would the proposed training exercises and other activities be consistent with the commercial and recreational fishing policies (Sections 30230, 30234 and 30234.5) of the Coastal Act.~~

~~As provided in 15 CFR § 930.4(b), in the event the Navy does not agree with the Commission's conditions of concurrence, then all parties shall treat this conditional concurrence as an objection.~~

G. PUBLIC ACCESS AND RECREATION

Section 30210 of the Coastal Act states:

> *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 states 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....*

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 its previous review of Navy SOCAL testing and training, the Commission found the activities consistent with the public access and recreation, and commercial and recreational fishing policies of the Coastal Act. The Navy's consistency determination states that while the proposed training and testing activities could temporarily limit access to ocean areas for a variety of human activities associated with commercial transportation and shipping, commercial recreation and fishing, subsistence use, and tourism. Nevertheless the Commission agrees with the Navy that under the Coastal Act's public access policies, exceptions are made for public safety and military security needs. The Navy further states under the proposal, no new restricted areas would be implemented, and also that when range clearance is required, as it has done historically, the public is notified through U.S. Coast Guard Notices to Mariners (NOTMARs). The Navy states:

> *This notice allows the public to select an alternate destination without an appreciable effect on their activities. In addition, the Navy maintains a website that notifies the public about closures in the areas surrounding San Clemente Island (http://www.scisland.org/).*

The Navy also states:

> *Restricted areas are typically avoided by experienced mariners. Prior to initiating a training or testing activity, the Navy would follow standard operating procedures to visually scan an area to ensure that nonparticipants are not present. If nonparticipants are present, the Navy would delay, move, or cancel its activity.*

The Navy concludes:

> *No impacts on public use or tourism within the coastal zone are anticipated because inaccessibility to areas of co-use would be temporary and of short duration (hours). Based on the Navy's standard operating procedures and the large expanse of the Study Area that would be available to the public, accessibility impacts would remain negligible. Thus, the Proposed Action would be consistent to the maximum extent practicable with Section 30210 of the California Coastal Act.*

The Commission concurs with the Navy's analysis and finds the proposed activities consistent with the public access and recreation policies of the Coastal Act.

APPENDIX A: SUBSTANTIVE FILE DOCUMENTS

1. Navy Consistency Determination CD-008-13.

2. Previous Navy Consistency Determinations CD-33-10 (Navy SSTC), CD-049-08, Navy SOCAL), CD-086-08 (Navy Onshore and offshore U.S. Pacific Fleet military 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).

3. Hawaii-Southern California Training and Testing Draft Environmental Impact Statement/Draft Overseas Environmental Impact Statement, U.S. Department of the Navy (May 2012).

4. Takes of Marine Mammals Incidental to Specified Activities - Proposed Rule published by the National Marine Fisheries Service, Federal Register Notice ((January 31, 2013).

5. Request for Letters of Authorization for the Incidental Harassment of Marine Mammals resulting from U.S. Navy Training And Testing Activities in the Hawaii-Southern California Training and Testing Study Area, Commander, United States Pacific Fleet, September 4, 2012.

6. Pacific Gas and Electric Consistency Certification CC-027-12, Seismic Survey offshore Diablo Canyon Nuclear Power Plant.

7. Moore J.E. and Barlow, J.P., Declining Abundance in beaked whales (Family *Ziphiidae*) in the California Current Large Marine Ecosystem. *PLoS ONE* 8(1):e52770 (2013).

8. Melcon, M.L., Cummins, A.J., Kerosky, S.M., Roche, L.K., Wiggins, S.M., Blue whales respond to anthropogenic noise, *PLoS ONE* 7(2): e32681 (2012).

9. Southall, B., Calambokidis, J., Tyack, P., Moretti, D., Hildebrand, J., Kyburg, C., Carlson, R., Friedlaender, A., Falcone, E., Schorr, G., Douglas, A., DeRuiter, S., Goldbogen, J., and Barlow, J., Biological and behavioral response studies of marine mammals in Southern California, 2010 (“SOCAL-10”) (2011).

10. Tyack, P.L., Zimmer, W.M.X., Moretti, D., Southall, B.L., Claridge, D.E., Durban, J.W., Clark, C.W., D’Amico, A., DiMarzio, N., Jarvis, S., McCarthy, E., Morrissey, R., Ward, J., and Boyd, I.L., Beaked whales respond to simulated and actual Navy sonar, *PLoS ONE* 6(3):e17009.doi:10.13371/journal.pone.0017009 (2011).

11. Brandon L. Southall, Ann E. Bowles, William T. Ellison, James J. Finneran, Roger L. Gentry, Charles R. Greene Jr., David Kastak, Darlene R. Ketten, James H. Miller, Paul E. Nachtigall, W. John Richardson, Jeanette A. Thomas, & Peter L. Tyack, Marine Mammal Noise Exposure Criteria: Initial Scientific Recommendations, Aquatic Mammals, Volume 33, Number 4, 2007.

12. Southern California (SOCAL) Fisheries Study: Catch Statistics (2002-2007), Fishing Access, and Fishermen Perception, Naval Undersea Warfare Center Division, February 2009.

APPENDIX B: Total Navy Take Requests, Both Hawaii and California Programs Combined

Table 5-1: Summary of Annual and 5-Year Take Request for Training Activities

MMPA Category	Source	Training Activities	
		Annual Authorization Sought	5-Year Authorization Sought
Mortality	Impulse	7 mortalities applicable to any small odontocete or pinniped species	35 mortalities applicable to any small odontocete or pinniped species over five years
	Unspecified[1]	2 mortalities to beaked whales[1]	10 mortalities to beaked whales over five years[1]
	Vessel strike	No more than 4 large whale mortalities in any given year[2]	No more than 12 large whale mortalities over five years over five years[2]
Level A	Impulse and Non-Impulse	266 - Species specific data shown in Table 5-2	1,314 - Species specific data shown in Table 5-2
Level B	Impulse and Non-Impulse	1,691,123 - Species specific data shown in Table 5-2	8,398,931 - Species specific data shown in Table 5-2

[1] For Training: The Navy's NAEMO model idid not quantitatively predict these mortalities. Navy, however, is seeking this particular authorization given sensitivities these species may have to anthropogenic activities. Request includes 2 Ziphidae beaked whale annually to include any combination of Cuvier's beaked whale, Baird's beaked whale, Longman's beaked whale, and unspecified Mesoplodon sp. (not to exceed 10 beaked whales total over the 5-year length of requested authorization).

[2] For Training: Navy cannot quantifiably predict that proposed takes from training will be of any particular species, and therefore seeks take authorization for any combination of large whale species (gray whale, fin whale, blue whale, humpback whale, Bryde's whale, sei whale, minke whale, or sperm whale), but of the 4 takes per year no more than 2 of any one species of blue whale, fin whale, humpback whale, sei whale, or sperm whale is requested.

Table 5-3: Summary Of Annual and 5-Year Take Request for Testing Activities

MMPA Category	Source	Testing Activities	
		Annual Authorization Sought	5-Year Authorization Sought
Mortality	Impulse	19 mortalities applicable to any small odontocete or pinniped species	95 mortalities applicable to any small odontocete or pinniped species over five years
	Vessel strike	No more than 2 large whale mortalities in any given year[1]	No more than 3 large whale mortalities over five years over five years[1]
Level A	Impulse and Non-Impulse	145 - Species specific data shown in Table 5-4	725 - Species specific data shown in Table 5-4
Level B	Impulse and Non-Impulse	238,880 - Species specific data shown in Table 5-4	1,194,400 - Species specific data shown in Table 5-4

[1] Navy cannot quantifiably predict that the proposed takes from testing (a total of 2 in a given year or over the course of 5-years) will be of any particular species, and therefore seeks take authorization for any combination of large whale species (gray whale, fin whale, blue whale, humpback whale, Bryde's whale, sei whale, minke whale, or sperm whale), but of the 2 takes in any given year, no more than 1 of each species of blue whale, fin whale, humpback whale, sei whale, or sperm whale is requested.

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W13a

File Date:	1/14/12
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Staff:	M. Delaplaine-SF
Staff Report/Findings:	3/21/13
Hearing Date:	3/8/13
Commission Vote:	0-9
Hearing on Findings:	4/10/13

REVISED FINDINGS ON CONSISTENCY DETERMINATION

Consistency Determination No.: **CD-008-13**

Federal Agency: **Department of the Navy**

Location: Southern California (SOCAL) Range Complex, a 120,000 square nautical mile (nmi^2) area including Santa Barbara, Santa Catalina, San Nicolas, and San Clemente Islands, and offshore waters, and offshore waters at the Silver Strand Training Complex (SSTC), Coronado (Exhibits 1-5)

Project Description: California portion of Hawaii-Southern California Training and Testing Program – Continuation of and modifications to Navy training and testing activities

Commission Action: Objection

Prevailing Commissioners: Commissioners Bochco, Brennan, Garcia, McClure, Mitchell, Sanchez, Zimmer, Vice-Chair Kinsey, and Chair Shallenberger

Note: To accurately reflect the Commission's action, staff's modifications to the February 21, 2013, Staff Recommendation (incorporating the changes from the March 6, 2013, Addendum) are shown herein as ~~strikethrough~~ and underline text. The recommended modifications are in the following sections:

Summary, pages 2-4.
Section II. (Action, Motion and Resolution), pages 7-9.
Section III. (Applicable Legal Authorities), pages 9-11.
Section IV. E (Marine Resources), pages 43-45.
Section IV. F (Commercial Fishing), page 48.

SUMMARY OF COMMISSION ACTION

The U.S. Department of the Navy (Navy) has submitted a consistency determination for the California portion of its Hawaii-Southern California Training and Testing Program. The program involves a large number of training and testing activities, primarily within existing offshore Navy range complexes and ocean operating areas (OPAREAs), as well as at Navy piers, ports, and shipyards. The program does not include training and testing activities on land (i.e., *onshore* activities at San Clemente Island or the Silver Strand Training Complex).

Briefly, the training elements involve anti-air warfare, amphibious warfare, strike warfare, anti-surface warfare, anti-submarine warfare, electronic warfare, and mine warfare activities. The testing activities involve Naval Air Systems Command Testing, Naval Sea Systems Command Testing, Space and Naval Warfare Systems Command Testing, and Office of Naval Research and Naval Research Laboratory Testing.

The standard of review for this Commission's review of federal consistency determinations is whether the project described in the consistency determination is consistent to the maximum extent practicable with the enforceable policies of the California Coastal Management Program (i.e., with Chapter 3 of the Coastal Act).

Based on the Navy's modeled estimates under the Marine Mammal Protection Act (MMPA), which use newer lower thresholds than the Navy applied the last time the Commission reviewed these types of activities (in 2008), and assuming that all the marine mammal species in the project area can be considered coastal species (as explained in pages 1~~8~~6-21~~8~~ below), the proposed activities could result in the behavioral harassment (qualifying as "Level B take" under the MMPA) of up to 1.78 million marine mammals per year, "Level A" take of up to 336 marine mammals, and up to 26 mortalities. Despite these modeled numbers, and the large number of "takes" requested in the Navy's application to the National Marine Fisheries Service (NMFS), the Navy concludes that the activities would not result in population-level effects to any species, and would be consistent with Coastal Act Section 30230.

The Commission ~~staff~~ does not believe that the Navy's conclusions are supported by ~~the~~ sufficient evidence. A recent beaked whale study calls into the question the Navy's conclusion with respect to beaked whales in southern California, and in any event, for all the affected marine mammals, it is simply impossible to establish whether population level effects have been

occurring, or would occur with the proposed increased training and testing levels, in part due to the fact that the Navy has been using this technology in this area consistently for the past 40 years. The Navy's conclusion, based on its monitoring, of a "lack of observable effects" is also called into question by recent studies designed to more comprehensively measure marine mammal reactions to military sonar and military-like sonar sounds, conducted in areas where the Navy trains such as SOCAL and the Bahamas. To date the studies have documented marine mammal reactions at sound levels far below the exposures the louder sources would generate. Also, if, as the Navy assumes in its modeling estimates, animals are moving away from the source, such movements would themselves be obvious effects, and significant, if they occurred while the animals were engaged in biologically significant behaviors such as feeding or mating.

~~Thus, even more compelling evidence is available now than it was in 2008 to establish the need for additional avoidance, monitoring, and mitigation measures, in order find the proposed increased training and testing activities consistent with the requirements of Section 30230.~~ In any event, ~~R~~regardless of whether population-level effects are occurring (or would occur from the proposed increases), the Coastal Act's marine resource protection policy (Section 30230) also requires enhancement (and where feasible restoration) of the overall marine environment, as well as special protection for areas and species of special biological or economic significance.

~~In the past these requirements have led the Commission to determinethat they necessitate the avoidance of the use of very loud active acoustic sources in biologically important and sensitive areas, in particular areas of high, or seasonally high, concentrations of marine mammals.~~ Under the current proposal, and given the information provided by the Navy, the Commission has determined that the consistency determination lacks sufficient information to enable it to determine consistency with the marine resource policy (Section 30230). The Commission makes this determination because the Navy's analysis: (1) only looked at population-level effects; (2) arbitrarily limited its analysis to only 10 of the 32 coastal species present in the southern California study area; (3) did not include the type of population-level analysis Pacific Gas and Electric Company had provided in its high energy seismic survey consistency certification (CC-027-12); (4) provided no explanation as to why significant intensification of use of mid-frequency sonar was needed for military training and testing; and (5) failed to analyze and consider alternatives such as implementing "time-area" closures, as well as other mitigation measures previously adopted by the Commission.

~~The staff is recommending that the Commission find that, for the activities to be consistent with Section 30230, conditions are needed to: (1) establish larger shutdown areas (up to 2 km) when marine mammals or other species are detected; (2) avoid use of mid-frequency sonar in sensitive areas, which would include Marine Protected Areas and Marine Sanctuaries, seasonal blue and gray whale areas and migration corridors, nearshore areas, and any biologically sensitive area NMFS may designate at a future date; (3) reduce sound under low-visibility conditions; (4) limit typical vessel speeds in sensitive areas to 10 knots (unless higher speeds are necessary for training); (5) improve observer effectiveness training; and (6) implement a contingency plan for use of nearshore explosives, in the event further mortalities (than the March 2011 incident discussed herein) occur. If the Navy were to agree to these conditions, the staff believes the Commission could find the activities consistent with Section 30230.~~

The Commission therefore objects to the Navy's consistency determination, finding that the Navy has not provided sufficient information to enable the Commission to determine the training and testing activities' consistency with Section 30230 of the Coastal Act.

The Commission also finds it has insufficient information to enable it ~~T~~to find the activities consistent with the commercial fishing policies of the Coastal Act, ~~the staff is recommending a condition requiring~~because the Navy has not explained why it is unable to implement measures recommended for consideration in its 2009 fishing survey (or provide an explanation to the Commission why implementation is infeasible).

The ~~staff is recommending that the~~ Commission finds the project as proposed consistent with the public access and recreation policies of the Coastal Act.

~~Thus, the staff is recommending conditional concurrence with the Navy's consistency determination. If the Navy does not agree with the conditions, then the conditional concurrence will be treated as an objection.~~

TABLE OF CONTENTS

APPENDICES

[Note: To save paper, printed copies of this version of the findings will not include the exhibits (except Exhibit 22, which was not previously included in the printed material). They are available upon request and can also be found on the Commission's website at: http://documents.coastal.ca.gov/reports/2013/3/F9a-3-2013.pdf. All exhibits will be posted on the April meeting website.]

EXHIBITS

Exhibit 1 – Overall Training Area
Exhibit 2 – Specific Training Area - SOCAL
Exhibit 3 – Specific Training Area – San Clemente Island Offshore
Exhibit 4 – Specific Training Area - San Clemente Island Nearshore
Exhibit 5 – Specific Training Area – Silver Strand Training Complex
Exhibit 6 – NMFS Marine Mammal Survey Maps
Exhibit 7 – Navy Beaked Whale Survey Map
Exhibit 8 – Navy CD Table 2-1 – Stressors Analyzed for Coastal Zone Effects
Exhibit 9 – Marine Protected Areas and Other Sensitive Areas
Exhibit 10 – Blue Whale Seasonally Sensitive Areas
Exhibit 11 – Navy LOA Request - Behavioral Reaction Analysis
Exhibit 12 – NMFS Proposed Rule Summary of Navy Monitoring
Exhibit 13 – Navy Behavioral Thresholds and Criteria
Exhibit 14 – Navy LOA Request - 6 dB ranges and percentages
Exhibit 15 – Navy Measures Implemented after March 2011 Dolphin Mortalities
Exhibit 16 – Navy 2009 Fishing Survey Recommendations
Exhibit 17 – Navy CD Appendix B - Stressors Matrix
Exhibit 18 – Navy CD Appendix A – Baseline and Proposed Training Activities
Exhibit 19 – CCC Conditions, Navy CDs CD-049-08 and CD-086-06
Exhibit 20 – Fin whale high concentration areas
Exhibit 21 - Letter, NOAA Administrator Jane Lubchenco, to Council on Environmental Quality Chair Nancy Sutley, dated January 19, 2010
Exhibit 22 – Composite Slide, Biologically Significant Areas (shown at hearing)

CORRESPONDENCE (Separate Attachment) Letter, NRDC to CCC, February 20, 2013

I. FEDERAL AGENCY'S CONSISTENCY DETERMINATION

The Department of the Navy has determined the project consistent to the maximum extent practicable with the California Coastal Management Program (CCMP).

II. COMMISSION ACTION, MOTION AND RESOLUTION

A. OBJECTION

On March 8, 2013, by a vote of 0 in favor, 8 opposed, the Commission objected to the consistency determination submitted by the Navy on the grounds that it has insufficient evidence in the record to determine whether the project will be in consistent to the maximum extent practicable with the policies of Chapter 3 of the Coastal Act.

B. MOTION AND RESOLUTION

Staff recommends that the Commission adopt the following motion in support of its decision:

Motion

I move that the Commission adopt the following findings in support of its objection to the Navy's consistency determination CD-008-13.

The staff recommends a YES vote on this motion. Pursuant to section 30315.1 of the Coastal Act, adoption of findings requires a majority vote of the members of the prevailing side present at the March 8, 2013, hearing, with at least three of the prevailing members voting. Only those Commissioners on the prevailing side of the Commission's action are eligible to vote. A majority vote by the prevailing Commissioners listed on page 1 of this report will result in adoption of the findings.

Resolution to Adopt Revised Findings

The Commission hereby adopts the findings set forth below for consistency determination CD-008-13 submitted by the Navy for the proposed project on the grounds that the findings support and accurately reflect the reasons for the Commission's March 8, 2013, objection and determination that it lacks sufficient information to determine the project would be consistent to the maximum extent practicable with the CCMP.

~~**Motion:**~~

~~*I move that the Commission* ***conditionally concur*** *with consistency determination CD-008-13 by concluding that 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.*~~

Staff recommends a **YES** vote on the motion. Passage of this motion will result in a concurrence with the determination of consistency, provided the project is modified in accordance with the recommended conditions, 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:

*The Commission hereby **conditionally concurs** with consistency determination CD-008-13 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.*

III. CONDITIONS

1. Safety Zones. The Navy will cease sonar transmissions whenever a marine mammal or sea turtle is detected within 2 km of the sonar dome, unless the sonar is being used at a critical point in the exercise such that the commanding officer determines certification or training effectiveness would be at risk.

2. Biologically Significant Areas. To the maximum extent feasible, the Navy will avoid exposing the following areas to high intensity active sonar. Avoidance will include a 4 km area around each of the following areas, for the MF1 Class Sonar (and for less intense sonars, a corresponding distance that would be the equivalent to the exposure level an MF1 Class would generate):

(a) the Channel Island National Marine Sanctuary (including around Santa Barbara Island);
(b) State and federal Marine Protected Areas (the areas shown on Exhibit 9);
(c) blue and fin whale high concentration areas (in the areas shown on Exhibits 10 & 20), seasonally, June thru November;
(d) known gray whale migration corridors, when gray whales are seasonally present;
(e) 1 km from shore (to protect coastal bottlenose dolphins); and
(f) any future NMFS-designated Biologically Important Area (BIA).

3. Night and low visibility conditions. To the maximum extent feasible, whenever any portion of the safety zone cannot be effectively monitored (including but not limited to nighttime, high sea state conditions (such as greater than Beaufort Stage 4 sea state), fog or other factors), the Navy will either avoid active sonar use, or will operate mid-frequency sonar under reduced power (i.e., a 6 dB reduction). If the latter, the Navy will use additional detection measures, such as infrared (IR) or enhanced passive acoustic detection. In addition, to the maximum extent feasible, gunnery exercises and exercises involving explosives in excess of 20 lbs. will be limited to daytime use.

4. Vessel Speeds. Except where higher speeds are critical to military training needs, in the areas (and when applicable, seasons) in Condition 2, and when transiting the Santa Barbara Channel (during June thru November), vessel speeds shall not exceed 10 knots.

~~5. **Effectiveness Training.** The Navy will continue its Lookout Effectiveness Study in the SOCAL range to compare the abilities of Navy vessel-based lookouts and experienced, NMFS-certified marine mammal observers in detecting marine mammals. To the maximum extent feasible, the study will be implemented, and marine mammal observers will carry out marine mammal searches onboard Navy vessels during the deployment of active sonar. During all times when marine mammal observers embark on Navy vessels, Navy lookouts and marine mammal observers will make use of the same equipment, search protocols, search distances, and search methods and shall carry out concurrent and independent marine mammal searches. All marine mammal detections will be recorded, will include distance and group number estimates, and will also specify whether the detection was made by a marine mammal observer, Navy lookout, or both parties independently. This marine mammal detection data will be submitted to the Commission's Executive Director for his review within one month of each marine mammal observer embark. If the results of the effectiveness study demonstrate that experienced, NMFS-certified marine mammal observers are more than 20% more likely than Navy observers to detect marine mammals, the Navy will, to the extent feasible, commit to including at least two experienced, NMFS-certified marine mammal observers on all ships during the deployment of active sonar for training or testing purposes. These marine mammal observers will notify appropriate Navy personnel of all marine mammal detections and will assist in the enforcement of marine mammal safety zones.~~

~~6. **Explosives Training Using Timer Delays.** In the event that an additional incident occurs where one or more marine mammal or sea turtle mortality results from a Navy exercise using timer delays, the Navy will either implement fail-safe technology (e.g., "positive" controls) or commit to including aerial monitoring during all future training events involving timer delay use with explosives.~~

~~7. **Fishing Communications Improvements.** Within one year, the Navy will agree to implement the recommendations of its 2009 Fishing Survey (listed on pages 42-43 below) or provide an explanation to the Commission as to why the Navy considers implementation infeasible.~~

III~~V~~. APPLICABLE LEGAL AUTHORITIES

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). The implementing regulations for the CZMA ("federal consistency regulations"), at 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." In its consistency determination, the Navy 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, which are the policies of Chapter 3 of the Coastal Act (Cal. Pub. Res. Code §§ 30200-30265.5).

~~**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.**~~

Objection based on lack of information~~**Standard of Review**~~
The federal consistency regulations (15 CFR § 930.43) provide for state agency objections based on lack of information, as follows:

> *§ 930.43 State agency objection.*
>
> *(b) If the State agency's objection is based upon a finding that the Federal agency has failed to supply sufficient information, the State agency's response must describe the nature of the information requested and the necessity of having such information to determine the consistency of the Federal agency activity with the enforceable policies of the management program.*
>
> *(c) State agencies shall send to the Director a copy of objections to Federal agency consistency determinations.*

(d) In the event of an objection, Federal and State agencies should use the remaining portion of the 90-day notice period (see § 930.36(b)) to attempt to resolve their differences. If resolution has not been reached at the end of the 90-day period, Federal agencies should consider using the dispute resolution mechanisms of this part and postponing final federal action until the problems have been resolved. At the end of the 90-day period the Federal agency shall not proceed with the activity over a State agency's objection unless:

(1) the Federal agency has concluded that under the "consistent to the maximum extent practicable" standard described in section 930.32 consistency with the enforceable policies of the management program is prohibited by existing law applicable to the Federal agency and the Federal agency has clearly described, in writing, to the State agency the legal impediments to full consistency (See §§ 930.32(a) and 930.39(a)), or

(2) the Federal agency has concluded that its proposed action is fully consistent with the enforceable policies of the management program, though the State agency objects.

(e) If a Federal agency decides to proceed with a Federal agency activity that is objected to by a State agency, or to follow an alternative suggested by the State agency, the Federal agency shall notify the State agency of its decision to proceed before the project commences.

IV. FINDINGS AND DECLARATIONS

A. PROJECT LOCATION AND DESCRIPTION

The Navy proposes to conduct a large number of training and testing activities, which would include the use of active sonar and explosives, primarily within existing range complexes and ocean operating areas (OPAREAs); at Navy piers, ports, and shipyards; and at contractor shipyards located along the U.S. Pacific coast, as well as in the transit corridor between Southern California and Hawaii. The proposal also includes pierside sonar testing conducted as part of overhaul, modernization, maintenance, and repair activities at Navy piers in Southern California. Training and testing activities on land areas within the study area (SCI and SSTC) are not part of the proposed action.

Briefly, the training elements involve anti-air warfare, amphibious warfare, strike warfare, anti-surface warfare, anti-submarine warfare, electronic warfare, and mine warfare activities. The testing activities involve Naval Air Systems Command Testing, Naval Sea Systems Command Testing, Space and Naval Warfare Systems Command Testing, and Office of Naval Research and Naval Research Laboratory Testing.

The project area is SOCAL Range Complex and SSTC. The SOCAL Range Complex an offshore area situated between Dana Point and San Diego, extending more than 600 nm southwest into the Pacific Ocean (Exhibit 1). The two primary components of the SOCAL Range

Complex are the OPAREAs and the special use airspace. These components encompass 120,000 square nautical miles (nmi^2) of sea space; 113,000 nmi^2 of special use airspace; and over 56 $mi.^2$ of land area.

Most of the special use airspace in the SOCAL Range Complex is defined by Warning Area 291 (W-291) (Exhibit 1), which extends vertically from the ocean surface to 80,000 ft. above mean sea level and encompasses 113,000 nm^2 of airspace. In addition to W-291, the SOCAL Range Complex includes:

• Western San Clemente OPAREA (Exhibit 3), a special use airspace extending from the surface to 5,000 ft. (1,524 m) above mean sea level.

• Helicopter Offshore Training Area (Exhibit 2), located off the coast of San Diego, and extending from the surface to 1,000 ft. (304.8 m) above mean sea level.

The SOCAL Range Complex includes approximately 120,000 nm^2 of sea and undersea space, largely defined as that ocean area underlying the Southern California special use airspace described above. The SOCAL Range Complex also extends beyond this airspace to include the surface and subsurface area from the northeastern border of W-291 to the coast of San Diego County, and includes San Diego Bay. In addition, a small part of the Point Mugu Sea Range (which is located predominantly northwest of the SOCAL Range Complex) is included in the Study Area. The Navy uses this approximately 1,000 nm^2 overlap area within the two ranges for anti-submarine warfare training conducted in the course of major range events.

The proposal also includes training and testing in ocean and bay areas at the Silver Strand Training Complex (SSTC) (Exhibit 5), as well as testing and maintenance at various Navy San Diego bay ship channels, piers and shipyards.

As will be described in the following section of this report, the Commission has previously reviewed Navy consistency determinations for training and testing in these locations. Exhibit 18, taken from the Navy's current consistency determination, identifies which activities would be within the coastal zone and compares existing and proposed activity levels. The consistency determination summarizes which of activities: (1) would be the same as those previously reviewed; (2) would be modified (i.e., different in scope, size, operation, intensity, frequency, or location); and (3) would be new. Very briefly, activities similar to previously reviewed activities would be:

- Air Combat Maneuver
- Air Defense Exercise
- Gunnery Exercise (GUNEX) (Surface-to-Air [S-A]) – Large-caliber
- GUNEX (S-A) – Medium-caliber
- Fire Support Exercise – Land-based Target
- Amphibious Assault
- Amphibious Assault – Battalion Landing
- Amphibious Raid
- Expeditionary Firing Exercise/Supporting Arms Coordination Exercise

- GUNEX (Surface-to-Surface [S-S]) Boat – Small-caliber
- Sinking Exercise
- Tracking Exercise/Torpedo Exercise (TRACKEX/TORPEX) – Surface
- Kilo Dip – Helicopter
- Electronic Warfare Operations
- Counter Targeting Flare Exercise
- Counter Targeting Chaff Exercise – Ship
- Counter Targeting Chaff Exercise – Aircraft
- Mine Countermeasure (MCM) Exercise – Surface
- Mine Neutralization – Explosive Ordnance Disposal
- MCM – Towed Mine Neutralization
- Airborne MCM – Mine Detection
- MCM – Mine Neutralization
- Mine Laying
- Marine Mammal System
- Shock Wave Action Generator
- Surf Zone Test Detachment/Equipment Test and Evaluation
- Personnel Insertion/Extraction – Submarine
- Personnel Insertion/Extraction – Non-submarine
- Underwater Demolition Multiple Charge – Mat Weave and Obstacle Loading
- Underwater Demolition Qualification/Certification
- Composite Training Unit Exercise
- Joint Task Force Exercise/Sustainment Exercise
- Integrated Anti-submarine Warfare Course
- Precision Anchoring
- Small Boat Attack
- Offshore Petroleum Discharge System
- Elevated Causeway System

Activities similar in nature to previously reviewed activities but with changes to scope, size, operation, intensity, frequency, or location, would be:

- Missile Exercise (MISSILEX) (Air-to-Air [A-A])
- MISSILEX – Man-portable Air Defense System
- Maritime Security Operations
- GUNEX (S-S) Ship – Small-caliber
- GUNEX (S-S) Ship – Medium-caliber
- GUNEX (S-S) Ship – Large-caliber
- GUNEX (Air-to-Surface [A-S]) Ship – Small-caliber
- MISSILEX (A-S)
- Bombing Exercise (A-S)
- Laser Targeting
- TRACKEX/TORPEX – Submarine
- TRACKEX/TORPEX – Helicopter
- TRACKEX/TORPEX – Maritime Patrol Aircraft
- TRACKEX/TORPEX – Maritime Patrol Advance Extended Echo Ranging Sonobuoys

- MCM Exercise – MCM Sonar – Ship Sonar
- Mine Neutralization – Remotely Operated Vehicle
- Ship Anti-submarine Warfare Readiness and Evaluation Measuring

New activities would be:

- GUNEX (A-A) – Medium-caliber
- GUNEX (S-S) Boat – Medium-caliber
- MISSILEX (S-S)
- GUNEX (A-S) – Medium-caliber
- MISSILEX (A-S) – Rocket
- Submarine Mine Exercise
- Maritime Homeland Defense/Security Mine Countermeasures
- Group Sail
- Submarine Navigation Exercise
- Submarine Under Ice Certification
- Surface Ship Sonar Maintenance
- Submarine Sonar Maintenance

The chart in Exhibit 18 which lists and compares the activities with previous levels uses the term "baseline," for existing activities levels, consistent with how the Navy defines the "No Project" or "Baseline" alternative in its Draft Environmental Impact Statement (DEIS) for the program (Hawaii-Southern California Training and Testing Draft Environmental Impact Statement/Draft Overseas Environmental Impact Statement, U.S. Department of the Navy (May 2012) (HSTT DEIS). This DEIS covers both the Navy's California and Hawaii Testing and Training Programs. Links to additional background materials, including the Navy's consistency determination, the HSTT DEIS, and NMFS' Proposed Rule for the activities, can be found on the Commission's web site at: http://www.coastal.ca.gov/fedcd/hstt/hstt.html .

B. PREVIOUS COMMISSION ACTIONS

On January 10, 2007, the Commission conditionally concurred with the Navy's consistency determination for offshore and onshore military training and testing exercises in SOCAL offshore waters (CD-086-06). The Commission's conditions, which focused primarily on the need for additional protection for marine mammals from Navy active sonar use, would (if the Navy had agreed to them) have resulted in the Navy agreeing to increase the size of the safety zones (including a shutdown zone of at least 2 km), avoid areas with high concentrations of marine mammals to the maximum extent feasible, and increase protection under low visibility and surface ducting conditions.

That Navy submittal was for activities over a two year period, ending in December 2008. Because the Navy did not agree to comply with most of the Commission's conditions, all parties were required to treat the Commission's action as an objection under the federal consistency procedures. (See 15 C.F.R. § 930.4(b).) The Navy informed the Commission it intended to proceed without agreeing to most of the conditions, and in March 2007 the Commission filed a lawsuit in federal court, the result of which is described in the following section of this report.

On October 15, 2008, the Commission conditionally concurred with a follow-up Navy consistency determination (CD-049-08) for the next round of Navy SOCAL training and testing exercises, covering the period from January 1, 2009, through December 31, 2013. The Commission adopted conditions similar to those in CD-086-06 (Exhibit 19, which contains both sets of Commission conditions). On January 16, 2009, the Navy again indicated its intent to proceed without agreeing to the conditions. By this time the U.S. Supreme Court had published its ruling in the case described below arising from the earlier training and testing, and in this instance the Commission did not file a lawsuit.

On August 10, 2010, the Commission conditionally concurred with the Navy's consistency determination (CD-033-10) for Navy training at its Silver Strand Training Complex (SSTC) in Coronado. The Navy did not agree to the Commission's conditions, which predominantly addressed onshore resources and training activities. The Commission did not challenge this Navy decision to proceed. As noted above, the Navy's current consistency determination incorporates the offshore (but not the onshore) activities at SSTC.

C. FEDERAL COURT, COUNCIL ON ENVIRONMENTAL QUALITY, AND PRESIDENTIAL ACTIONS

As noted above, litigation arose over the first of the above-described projects, with the Commission challenging the Navy under the CZMA, and environmental groups led by the Natural Resources Defense Council ("NRDC") challenging the Navy under the Marine Mammal Protection Act (MMPA), the CZMA, the National Environmental Policy Act (NEPA), and the Endangered Species Act (ESA). Over a seven-month period from mid-2007 to early 2008, the Federal District Court and Ninth Circuit Court of Appeals considered more than half-a-dozen orders, mostly related to NRDC's motion for a preliminary injunction. At the end of that period, the result of these lower court actions was the issuance of a preliminary injunction[1] requiring that the Navy comply with a set of mitigation measures, consisting of: (1) imposing a 12-mile "exclusion zone" from the coastline; (2) using lookouts to conduct additional monitoring for marine mammals; (3) restricting the use of "helicopter-dipping" sonar; (4) limiting the use of mid-frequency active (MFA) sonar in geographic "choke points"; (5) shutting down MFA sonar when a marine mammal is spotted within 2,200 yards of a vessel; and (6) powering down MFA sonar by 6 decibels (dB) during significant surface ducting conditions.

[1] "Modified Preliminary Injunction" issued on January 10, 2008, in the case of *NRDC v. Winter*, C.D. Cal. Case No. 8:07-cv-00335-FMC-FMO.

Within days following the district court's issuance of its revised injunction, the Navy: (1) sought (and received) an exemption from the President under the CZMA[2]; and (2) sought (and received) an emergency authorization from the Council on Environmental Quality ("CEQ") for "alternative NEPA arrangements"[3]. The Navy moved to vacate the district court's preliminary injunction in light of these actions, but on February 4, 2008, the district court refused to do so, and the Court of Appeals affirmed, finding, among other things, that the plaintiffs were likely to succeed on the merits of their claims, but focusing solely on the NEPA claims.

In *Winter v. Natural Res. Def. Council, Inc., 129 S. Ct. 365 (2008)*, the U.S. Supreme Court reversed the lower court rulings and vacated the preliminary injunction. The Supreme Court's ruling did not address the merits of the NEPA claims but only addressed the standard for issuance of a preliminary injunction, the application of that standard to the facts of this case, and the appropriate remedy under NEPA. The ruling did not address CZMA grounds.

D. OTHER AGENCY APPROVALS AND CONSULTATIONS

National Marine Fisheries Service (NMFS)
Pursuant to the Marine Mammal Protection Act (MMPA) (16 U.S.C. § 1371(a)(5)), the Navy has submitted a request for two Letters of Authorization (LOAs) from NMFS (one LOA for the training and one LOA for the testing) for the incidental taking of marine mammals, under the Marine Mammal Protection Act (MMPA) (the LOAs would also include species protected under the ESA). On January 31, 2013, NMFS published a proposed rule, requesting comments on its proposal to issue regulations and Letters of Authorization (LOAs) to the Navy for the proposed activities (as well as the Hawaii activities, which are not before the Commission). The public comment period remains open and ends on March 11, 2013.

U.S. Fish and Wildlife Service (USFWS)
The Navy is consulting with the U.S. Fish and Wildlife Service (USFWS) under Section 7 of the ESA for three listed seabird species under USFWS' jurisdiction.

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[2] CZMA §307(c)(1)(B) (16 U. S. C. §1456(c)(1)(B)) provides, in part:

> *After any final judgment, decree, or order of any Federal court that is appealable under section 1291 or 1292 of title 28, United States Code, or under any other applicable provision of Federal law, that a specific Federal agency activity is not in compliance with subparagraph (A), and certification by the Secretary that mediation under subsection (h) is not likely to result in such compliance, the President may, upon written request from the Secretary, exempt from compliance those elements of the Federal agency activity that are found by the Federal court to be inconsistent with an approved State program, if the President determines that the activity is in the paramount interest of the United States.*

[3] NEPA (40 CFR §1506.11) provides:

> *Where emergency circumstances make it necessary to take an action with significant environmental impact without observing the provisions of these regulations, the Federal agency taking the action should consult with the Council about alternative arrangements. Agencies and the Council will limit such arrangements to actions necessary to control the immediate impacts of the emergency. Other actions remain subject to NEPA review.*

State of Hawaii
The Navy has submitted a consistency determination to the Hawaii Coastal Zone Management Program for the portions of the training and testing located off that state.

E. MARINE RESOURCES

Coastal Act Section 30230 states:

> *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.*

Overview
The Commission has been consistent for almost two decades in expressing concerns over the effects of anthropogenic sounds on the marine environment, particularly on marine mammals. As noted in its December 13, 2005, comments to the Marine Mammal Commission's Advisory Committee on Acoustic Impacts on Marine Mammals, the Commission stated:

> *Anthropogenic noise is a recognized, but largely unregulated, form of ocean pollution that can deafen, disturb, injure, and kill marine life. Many species of marine mammals are known to be highly sensitive to sound and rely upon sound to navigate, find food, locate mates, avoid predators, and communicate with one another. A combination of noise sources, including shipping, oil and gas exploration and production, dredging, construction, and military activities, has resulted in dramatic increases in noise levels throughout the oceans. Over the last ten years, a growing body of evidence has shown that some forms of ocean noise can kill, injure, and deafen whales and other marine mammals. In particular, a sequence of marine mammal strandings and mortalities has been linked to exposure to mid-frequency sonar. There is also evidence that some affected animals do not strand but die at sea. This has increased public concern about the effects of anthropogenic noise on marine mammals, which has been acknowledged in a variety of domestic and international fora.*
>
> *Marine mammals have evolved over millions of years and rely on sound for vital life functions and have specialized sensory capabilities to take advantage of the physics of sound in the ocean. Anthropogenic noise in the oceans has increased since the start of the industrial revolution and increases in ambient noise levels, as well as individual sound sources, can cause adverse effects, the extent and type of which are not well understood. Military technology and scientific research using low frequency active acoustics attempting to cover large distances have specifically targeted the ecological sound niches that low frequency specialist whales have evolved to rely on, necessarily competing with those marine mammal species. Peer-reviewed scientific literature indicates that marine mammals are affected by exposure to anthropogenic noise in a variety of ways that can be harmful or even lethal. However, there are significant gaps in information available to understand and manage these effects. This is particularly the*

> *case because marine mammals are extremely difficult to study and the marine environment is extraordinarily complex and dynamic. In addition, this is a relatively new field of concern and the amount of research undertaken to date has been limited in scope and duration.*

In light of these concerns, during its previous two reviews of Navy SOCAL offshore testing and training, the Commission adopted conditions intended to increase protection for marine mammals, seeking, among other things, larger preclusion areas, avoidance of biologically sensitive areas, and lowering of maximum sound levels under low-visibility conditions. As noted above (pages 14-152), the Navy historically has not agreed to a number of the Commission's conditions and has maintained that its mitigation and monitoring measures are adequate to protect marine mammals (and other species). The Navy's position has been that the lack of documented population-level effects, combined with its monitoring results (reported annually), which have not documented significant adverse marine mammal reactions to its activities, support its conclusion that its activities are consistent with Section 30230 of the Coastal Act. The Commission and the Navy have also historically disagreed over the number of marine mammal species that can be considered coastal zone resources. The Navy *has* historically agreed to past Commission's requests for additional surveillance, passive and aerial monitoring, stranding reporting, and retrieval of inert mine shapes (where feasible).

The Navy's consistency determination, the full text of which can be viewed at: http://www.coastal.ca.gov/fedcd/hstt/Navy%20Consistency%20Determination%20HSTT%20for%20CA.pdf , begins with an overview of its conclusions on marine mammal effects, stating:

> *The Proposed Action includes activities that affect coastal resources. These activities include sonar activities, underwater detonations, temporary logistics-over-the-shore training activities (i.e., pile-driving), and amphibious landings in the coastal zone. Marine resources that could be affected by the Proposed Action include sensitive habitats (e.g., eelgrass and kelp), commercial and recreational fish stocks, and protected marine species (i.e., sea turtles, marine mammals, and abalones).*
>
> *Based upon the analysis provided for each resource in this section, the Navy has determined that there are no population-level impacts on any species of biological or economic significance as a result of the Proposed Action. Therefore, the Proposed Action is consistent to the maximum extent practicable with Section 30230 of the California Coastal Act.*

As a preliminary matter, the Commission finds that, by focusing on population-level impacts, the Navy misconstrued the standard for consistency with Section 30230 of the Coastal Act. As shown above, that section contains three sentences. Only the final sentence refers to uses of the marine environment needing to "maintain healthy populations of all species of marine organisms adequate for [various] purposes." Basic canons of statutory interpretation provide that the other sentences within that section must mean something more or different from that. For example, the first sentence, which requires that marine resources be "maintained, enhanced, and where feasible, restored," must be given independent meaning and significance, and cannot be reduced

to meaning nothing more than that which is also contained in the third sentence. Therefore, impacts that do not maintain, enhance, and where feasible restore, marine resources, may be inconsistent with Section 30230 regardless of whether they impose population-level impacts.

Effects

The Commission also disagrees with the Navy's assessment of what constitute coastal zone resources. The consistency determination (p. 15) acknowledges that coastal zone effects include "Coastal zone resources include both resources permanently located in the coastal zone (e.g., benthic organisms) and mobile resources (e.g., marine mammals and sea turtles) that typically move into and out of the coastal zone as part of a natural cycle."

The consistency determination (p. 48) notes that 43 marine mammal species occur within the SOCAL and Hawaii range areas, including 36 cetaceans (7 mysticetes (baleen whales) and 29 odontocetes (dolphins and toothed whales)), 6 pinnipeds (seals and sea lions), and the Southern sea otter. Nine of these species are tropical or endemic to the waters around Hawaii and are not known to occur off of California, and two (the striped dolphin and Sei whale) are thought to only occur in pelagic waters far offshore. However, of the 32 remaining species the Navy's consistency determination considers only 10 to be "coastal species" (as listed in consistency determination Table 3-7 below):

Table 3-7: Southern California Marine Mammal Species Occurrences in Coastal Zone

Common Name Species Name	SOCAL Range Complex Occurrence	Seasonal Occurrence		Coastal Zone Occurrence (√)	
		May-Oct (warm)	Nov-Apr (cold)	Resident	Occasional
Gray whale *Eschrichtius robustus*	Transient during seasonal migrations	NO	YES		√
Bottlenose dolphin coastal *Tursiops truncatus*	Limited, small population within one km of shore	YES	YES	√	
Long-beaked common dolphin *Delphinus capensis*	Common; more inshore distribution	YES	YES		√
Risso's dolphin *Grampus griseus*	Common; higher densities Nov-Apr	YES	YES		√
Pacific white-sided dolphin *Lagenorhynchus obliquidens*	Common; year round cool water species	YES	YES		√
Harbor seal *Phoca vitulina*	Common; Channel Islands haul-outs including SCI	YES	YES	√	
Northern elephant seal *Mirounga angustirostris*	Common; Channel Island haul-outs of different age classes; including SCI Dec-Mar and Apr-Aug; spend 8-10 months at sea	YES	YES	√	
California sea lion *Zalophus californianus*	Common; most common pinniped, Channel Islands breeding sites in summer	YES	YES	√	
Guadalupe fur seal *Arctocephalus townsendi*	Rare; Occasional visitor to northern Channel Islands; mainly breeds on Guadalupe Is., Mexico, May-Jul	UNK	UNK		√
Southern Sea Otter *Enhydra lutris*	Main distribution at San Nicolas Island on the northern end of the SOCAL Range Complex; translocated population of approximately 29 animals, is experimental population not considered endangered	YES	YES	√	

Note: UNK = unknown

The Navy's previous consistency determination for SOCAL Training (CD-049-08) held a similar position that only 10 species were coastal zone species. The Navy's analysis in that consistency determination indicated its position was based on whether the species occurred in the coastal zone on a "regular or cyclic" basis, and that the remaining species "… are more typically open ocean species not normally found in or near the [coastal zone]." In the above table (last column), however, the Navy appears now to be considering as coastal species those which are "occasional[ly]" present in the coastal zone. Regardless of whether the Navy is proposing a standard based on whether a species' occurrence is "regular or cyclic" or "occasional," the Commission disagrees with the Navy that only this limited number of marine mammal species is found within the coastal zone, occasionally or otherwise, and reiterates its previous findings from CD-049-08:

> *The Commission disagrees with the Navy over both which activities affect the coastal zone, as well as which species are coastal zone species. As the Commission noted in reviewing the previous Navy consistency determination for its southern California training activities:*

> *However the Commission takes a broader view than the Navy as to which activities may affect the coastal zone. Many of the species … potentially affected by the proposed training activities spend some portions of their life cycles within coastal waters….*

To support this position, during that review the Commission cited the NOAA letter dated March 10, 1995, responding to the Commission's request from the Office of Coastal Resource Management (OCRM) to review the effects of the "ATOC" sound source[4], located 48 nmi offshore of San Mateo County. In that letter NOAA affirmed that "sounds emanating from the ATOC sound source can be reasonably expected to affect marine mammals that are resources of both the outer continental shelf ("OCS") and the coastal zone…" and "OCRM has determined that the marine animals at issue that ply the waters of the coastal zone and the OCS are coastal resources."

Further support for the Commission's position that additional species – beyond the ten identified by the Navy – spend portions of their life cycle in the coastal zone is provided in Exhibits 6-7, which include the results from past NOAA oceanographic marine mammal surveys (and, for Cuvier's beaked whales, the results of Navy tracking and academic research). These surveys document the fact that virtually all of the marine mammal species identified by the Navy as present in the SOCAL area are also present within the coastal zone at some point in their life cycle, and certainly at least "occasionally." Regarding the length of time a species must be present within the coastal zone to be considered a coastal resource, the Commission is in agreement that occasional observed or recorded presence is sufficient to establish this standard. Due to the significant challenges associated with wildlife observation in the marine environment (i.e. the cost of surveys, the short period of time most species are observable at the surface, the large areas, variable climactic and weather conditions, etc.) marine mammal surveyors typically assume that the number of animals successfully observed represent a small fraction of the actual number that are likely present. As such, the Commission considers even infrequent and seemingly rare sightings of particular marine wildlife species within the coastal zone as verification of that species' status as a coastal resource.

Finally, similar to the Commission's long held position regarding effects to commercial fishing that occur in federal waters, but which affect the coastal economy, the Commission takes a comparable position that effects on whale watching, even if occurring in federal waters outside the coastal zone, should also be considered coastal zone effects, since whale watching tours are also an important segment of the California coastal economy, as well as an important component of coastal recreation. Whale watching tours regularly ply federal waters and commonly include sightings of many of the marine mammals present in the SOCAL area. For a single representative example in southern California, the Commission notes one such southern California whale watching tour which reports such sightings at http://www.newportwhales.com/whalecount.html .

[4] ATOC is the acronym for Scripps Institution of Oceanography's Acoustic Thermometry of Ocean Climate, reviewed by the Commission as Consistency Certification CC-110-94.

The consistency determination contains an Appendix A which includes details, by activity, as to whether the activity is located within the coastal zone, and the degree of proposed changes in intensity (including a comparison with baseline levels[5]). The Commission generally *agrees* with the Navy as to the *types* of activities likely to affect coastal resources. The consistency determination includes (in Appendix B) a checklist, by activity, which identifies the "stressors" that could affect each resource (e.g., sediments and water quality, marine mammals, fish and socioeconomics). The Navy states: "If a resource could be affected by a stressor, then the Proposed Action has reasonably foreseeable effects on that coastal zone resource." Based on its analysis of the stressors listed in Table 2-1 (consistency determination, p. 16) (Exhibit 8), the Navy summarizes these as follows:

> • Acoustic (sonar and other active sources, explosives, pile driving, airguns, weapons firing noise, vessel noise, aircraft noise)
>
> • Energy (electromagnetic)
>
> • Physical disturbance or strikes (vessels and in-water devices, military expended materials, seafloor devices)
>
> • Entanglement (fiber optic cables, guidance wires, and parachutes)
>
> • Ingestion (munitions and military expended material other than munitions)
>
> • Secondary stressors (changes in availability of marine resources, sediment and water quality)

In its "effects" analysis, the Navy states that the primary activities located outside the coastal zone that it considers would be reasonably likely to affect the coastal zone would be:

> *… activities using sonar (e.g., anti-submarine warfare tracking exercises and tests), activities using high-explosive ordnance (e.g., air-to-surface missile exercises and tests), mine warfare activities using high explosives (e.g., mine neutralization tests), torpedo exercises and tests, and unmanned vehicle exercises and tests.*

Acoustic Modeling and Thresholds

Specifically analyzing acoustic effects, the Navy's consistency determination (pp. 50-55) reflects a new, more complex (compared to the model used during the Commission's previous review), "Navy Acoustic Effects Model" to estimate marine mammal effects. The model predicts exposures of marine mammals before considering mitigation and marine mammal avoidance in response to the noise exposure, and then factors in additional adjustments based on mitigation it expects to be implemented and marine mammal avoidance. For what it considers the 10 coastal species, the Navy's model predicts the numbers and levels of "harassment" to coastal species shown the table (Table 3-9) below:

[5] As stated earlier, the Navy defines "baseline" to mean current levels of testing and training.

Table 3-9: Annual Exposures from Modeling Estimates of Impulsive and Non-impulsive Sources under the Proposed Action

Species	Stock	Training Exposures			Testing Exposures		
		Level B	Level A	Mortality	Level B	Level A	Mortality
Gray whale	Eastern North Pacific	9,560	2	0	2,570	1	0
Bottlenose dolphin coastal	CA/OR/WA Offshore	26,618	0	0	2,407	0	0
	California Coastal	521	0	0	769	0	0
Long-beaked common dolphin	CA/OR/WA	73,113	2	0	47,851	2	0
Risso's dolphin	CA/OR/WA	86,564	1	0	8,739	1	0
Pacific white-sided dolphin	CA/OR/WA	38,467	1	0	4,924	1	0
Harbor seal	California	5,906	11	0	892	3	0
Northern elephant seal	California Breeding	22,516	22	0	2,712	5	0
California sea lion	U.S. Stock	126,961	25	0	13,038	17	0
Guadalupe fur seal	Mexico	2,603	0	0	269	0	0
Southern sea otter	San Nicolas Island Experimental Population	0	0	0	0	0	0

Notes: CA = California; OR = Oregon; WA = Washington; U.S. = United States

Because they were generated primarily for MMPA analysis, all the tables distinguish "Level A" and "Level B" harassment categories defined under the Marine Mammal Protection Act, definitions which the Commission has historically found a useful way to categorize impacts, particularly if appropriate thresholds are used. The MMPA defines "harassment" for purposes of reviewing military readiness activities[6] as either:

> ***Level A Harassment*** - *any act that injures or has the significant potential to injure a marine mammal or marine mammal stock in the wild; or*
>
> ***Level B Harassment*** - *any act that disturbs or is likely to disturb a marine mammal or marine mammal stock in the wild by causing disruption of natural behavioral patterns, including, but not limited to, migration, surfacing, nursing, breeding, feeding, or sheltering, to a point where such behavioral patterns are abandoned or significantly altered.*

[6] Defined in Public Law 107-314 to include (1) all training and operations of the Armed Forces that relate to combat; and (2) the adequate and realistic testing of military equipment, vehicles, weapons, and sensors for proper operation and suitability for combat use.

For the reasons described above, the Commission considers the 22 of the remaining SOCAL marine mammal species to be coastal zone species.

Sub-Order or Family	Number of Species in SOCAL	Numbers Navy Finds to be Coastal Resources	Number CCC finds to be Coastal Resources
Odontocetes (toothed whales and dolphins)	21	4	20
Mysticetes (baleen whales)	7	1	6
Pinnipeds (seals and sea lions)	5	4	5
Mustelids (otters)	1	1	1
TOTAL	34	10	32

To evaluate potential impacts to the 22 species not included within the Navy's consistency determination, the Commission staff requested, and the Navy has provided, the estimates it provided to NMFS for some additional SOCAL species. However, these estimates do not include two coastal species (the southern sea otter and Guadalupe fur seal). While the occurrence of these species within the SOCAL range is expected to be low, Commission staff has been unable to evaluate potential impacts to these species. This table included below provides the impact estimates for the remaining marine mammal species[7] and also indicates (in the right-hand column) the percentage of the total number of Level B impacts shown in this table that is represented by the impacts predicted for each individual species, which boxes depicting the most predominantly affected species.

[7] The five separate species of Mesoplodon beaked whales are considered under a single heading, bottlenose dolphins are considered as separate coastal and offshore populations, and Ko~~i~~gia spp. are also included for analysis.

TRAINING

Species	SOCAL Training Alt 2 Annual Max Total Impulse, Non-Impulse, and Pile Driving/Removal			% Level B of total
	Level B	Level A	Mortal	
Blue Whale	4,145	0	0	0.3%
Fin Whale	1,528	0	0	0.1%
Humpback Whale	1,081	0	0	0.1%
Sei Whale	146	0	0	0.0%
Sperm Whale	1,958	0	0	0.1%
Guadalupe Fur Seal	2,603	0	0	0.2%
Bryde's Whale	112	0	0	0.0%
Gray Whale	9,560	2	0	0.6%
Minke Whale	359	0	0	0.0%
Baird's Beaked Whale	4,420	0	0	0.3%
Bottlenose Dolphin Coastal	521	0	0	0.0%
Bottlenose Dolphin	26,618	0	0	1.7%
Cuvier's Beaked Whale	13,353	0	0	0.9%
Dall's Porpoise	36,891	47	0	2.4%
Killer Whale	321	0	0	0.0%
Kogia spp.	12,943	33	0	0.8%
Long-beaked Common Dolphin	73,113	2	0	4.7%
Mesoplodon beaked whales	1,994	0	0	0.1%
Northern Right Whale Dolphin	51,596	1	0	3.3%
Pacific White-Sided Dolphin	38,467	1	0	2.5%
Risso's Dolphin	86,564	1	0	5.6%
Short-beaked Common Dolphin	999,282	70	3	64.6%
Short-finned Pilot Whale	308	0	0	0.0%
Striped Dolphin	3,545	0	0	0.2%
California Sea Lion	126,961	25	4	8.2%
Northern Fur Seal	20,083	5	0	1.3%
Harbor Seal	5,906	11	0	0.4%
Northern Elephant Seal	22,516	22	0	1.5%
	1,546,894	220	7	

TESTING

Species	SOCAL Testing Alt 2 Annual Max Total Impulse and Non-Impulse			
	Level B	Level A	Mortal	*% Level B of total*
Blue Whale	413	0	0	0.2%
Fin Whale	202	0	0	0.1%
Humpback Whale	101	0	0	0.0%
Sei Whale	21	0	0	0.0%
Sperm Whale	146	0	0	0.1%
Guadalupe Fur Seal	269	0	0	0.1%
Bryde's Whale	5	0	0	0.0%
Gray Whale	2,570	1	0	1.1%
Minke Whale	49	0	0	0.0%
Baird's Beaked Whale	1,045	0	0	0.5%
Bottlenose Dolphin Coastal	769	0	0	0.3%
Bottlenose Dolphin	2,407	4	0	1.1%
Cuvier's Beaked Whale	2,319	0	0	1.0%
Dall's Porpoise	5,215	32	0	2.3%
Killer Whale	53	0	0	0.0%
Kogia spp.	1,232	6	0	0.5%
Long-beaked Common Dolphin	47,851	2	0	21.2%
Mesoplodon beaked whales	345	0	0	0.2%
Northern Right Whale Dolphin	5,729	1	0	2.5%
Pacific White-Sided Dolphin	4,924	1	0	2.2%
Risso's Dolphin	8,739	1	0	3.9%
Short-beaked Common Dolphin	122,748	40	13	54.3%
Short-finned Pilot Whale	79	0	0	0.0%
Striped Dolphin	998	0	0	0.4%
California Sea Lion	13,038	17	6	5.8%
Northern Fur Seal	1,088	3	0	0.5%
Harbor Seal	892	3	0	0.4%
Northern Elephant Seal	2,712	5	0	1.2%
	225,959	116	19	

The numbers of "harassments" shown in all the above tables are significantly larger than those included in previous Navy SOCAL consistency determinations, for several reasons. The primary reason is because both the Navy and NMFS have refined the threshold levels they are using in their analyses in light of research results and studies published since the Commission's last (2008) review. Overall, the current level of scientific understanding suggests that marine mammals are more sensitive to lower sound levels than previously thought. In addition, the numbers increase because the Navy has proposed increases in several activities that it estimates would result in harassments. For example, mid-frequency sonar hours, and in particular, "MF1" Source Class, which includes the loudest of the mid-frequency sonars (e.g., AN/SQS-53 and AN/SQS-60), would increase significantly, as shown in the following table. [Note: the table includes both California and Hawaii Navy sonar use; however the Navy has stated that 95% of sonar use would occur in SOCAL. Also, No Action Alternative refers to current testing and training levels; Alternative 2 refers to the proposed levels.]:

Table 3.0-8: Training and Testing Tactical Acoustic Sources Used in the Hawaii-Southern California Training and Testing Study Area

Source Class Category	Source Class	Source Use (Annual, in Hours) for Training Activities			Source Use (Annual, in Hours) for Testing Activities		
		No Action Alternative	Alternative 1	Alternative 2	No Action Alternative	Alternative 1	Alternative 2
Low-Frequency (LF) Sources that produce signals less than 1 kHz	LF4	0	0	0	1,588	1,871	2,157
	LF5	0	0	0	840	960	1,080
	LF6	0	0	0	0	200	204
Mid-Frequency (MF) Tactical and non-tactical sources that produce signals from 1 to 10 kHz	MF1	4,454	10,382	11,534	25	129	137
	MF1K	83	88	88	0	10	10
	MF2	1,146	2,759	3,047	0	64	64
	MF2K	27	34	34	0	0	0
	MF3	898	2,133	2,133	119	340	381
	MF4	656	858	888	8	21	515
	MF5	768	1,279	1,371	121	157	427
	MF6	0	0	0	0	0	4
	MF8	0	0	0	40	32	40
	MF9	0	0	0	270	2,668	2,949
	MF10	0	0	0	0	19	20
	MF11	0	1,120	1,120	0	0	0
	MF12	255	949	1,093	0	8	12

The Navy's request for Letters of Authorization (LOA) from NMFS, pp. 138-141 (Exhibit 11), includes newer (than used during previous Commission reviews) revised thresholds, based on syntheses cited as "Nowacek et al. 2007" and "Southall et al. 2007b," as well as more recently published studies. The LOA request states:

> *Southall et al. (Southall et al. 2007b) synthesized data from many past behavioral studies and observations to determine the likelihood of behavioral reactions at specific sound levels. While in general, the louder the sound source the more intense the behavioral response, it was clear that the proximity of a sound source and the animal's experience, motivation, and conditioning were also critical factors influencing the response (Southall*

> *et al. 2007b). After examining all of the available data, the authors felt that the derivation of thresholds for behavioral response based solely on exposure level was not supported because context of the animal at the time of sound exposure was an important factor in estimating response. Nonetheless, in some conditions, consistent avoidance reactions were noted at higher sound levels depending on the marine mammal species or group allowing conclusions to be drawn. Most low-frequency cetaceans (mysticetes) observed in studies usually avoided sound sources at levels of less than or equal to 160 dB re 1 µPa. Published studies of mid-frequency cetaceans analyzed include sperm whales, belugas, bottlenose dolphins, and river dolphins. These groups showed no clear tendency, but for non-impulsive sounds, captive animals tolerated levels in excess of 170 dB re 1 µPa before showing behavioral reactions, such as avoidance, erratic swimming, and attacking the test apparatus. High-frequency cetaceans (observed from studies with harbor porpoises) exhibited changes in respiration and avoidance behavior at levels between 90 and 140 dB re 1 µPa, with profound avoidance behavior noted for levels exceeding this. Phocid seals showed avoidance reactions at or below 190 dB re 1 µPa; thus, seals may actually receive levels adequate to produce TTS before avoiding the source. Recent studies with beaked whales have shown them to be particularly sensitive to noise, with animals during three playbacks of sound breaking off foraging dives at levels below 142 dB sound pressure level, although acoustic monitoring during actual sonar exercises revealed some beaked whales continuing to forage at levels up to 157 dB sound pressure level (Tyack et al. 2011).* [Emphasis added]

Concerning recent blue whale studies, the LOA request cites Melcón et al. 2012 as indicating "Blue whales exposed to mid-frequency sonar in the Southern California Bight were less likely to produce low frequency calls usually associated with feeding behavior," and Southall et al. 2011 as indicating:

> *Preliminary results from the 2010–2011 field season of the ongoing behavioral response study in southern California waters indicated that in some cases and at low received levels, tagged blue whales responded to mid-frequency sonar but that those responses were mild and there was a quick return to their baseline activity (Southall et al. 2011).*

Summarizing recent beaked whale studies, the LOA request states:

> *From 2007 to 2011, behavioral response studies were conducted through the collaboration of various research organizations in the Bahamas, Southern California, the Mediterranean, Cape Hatteras, and Norwegian waters. These studies attempted to define and measure responses of beaked whales and other cetaceans to controlled exposures of sonar and other sounds to better understand their potential impacts. Results from the 2007–2008 study conducted near the Bahamas showed a change in diving behavior of an adult Blainville's beaked whale to playback of mid-frequency source and predator sounds (Boyd et al. 2008; Tyack et al. 2011). Reaction to mid-frequency sounds included premature cessation of clicking and termination of a foraging dive, and a slower ascent rate to the surface. Preliminary results from a similar behavioral response study in southern California waters have been presented for the 2010–2011 field season (Southall et al. 2011). Cuvier's beaked whale responses suggested particular sensitivity to sound*

exposure as consistent with results for Blainville's beaked whale. Similarly, beaked whales exposed to sonar during British training exercises stopped foraging (DSTL 2007), and preliminary results of controlled playback of sonar may indicate feeding/foraging disruption of killer whales and sperm whales (Miller et al. 2011).

Acoustic analyses also differentiate between Permanent Threshold Shift (PTS) and Temporary Threshold Shift (TTS), with PTS considered part of Level A harassment (which can also include mortality), and TTS considered part of Level B harassment (which can also include certain levels of behavioral harassment).[8] The Navy's current thresholds used in its LOA application are shown below. Table 6-1 indicates thresholds used for TTS and PTS for non-impulsive sound (which is how sonar is categorized). Table 6-2 indicates Behavioral, TTS, PTS, and Mortality thresholds and impulsive sounds and explosives. Table 6-4 indicates Level A and Level B thresholds for pile driving.

Table 6-1: Onset TTS and PTS Thresholds for Non-Impulsive Sound

Group	Species	Onset TTS	Onset PTS
Low-Frequency Cetaceans	All mysticetes	178 dB re 1µPa2-sec(LF_{II})	198 dB re 1µPa2-sec(LF_{II})
Mid-Frequency Cetaceans	Most delphinids, beaked whales, medium and large toothed whales	178 dB re 1µPa2-sec(MF_{II})	198 dB re 1µPa2-sec(MF_{II})
High-Frequency Cetaceans	Porpoises, *Kogia* spp.	152 dB re 1µPa2-sec(HF_{II})	172 dB re 1µPa2-secSEL (HF_{II})
Phocidae In-water	Harbor, Hawaiian Monk, Elephant seals	183 dB re 1µPa2-sec(P_{WI})	197 dB re 1µPa2-sec(P_{WI})
Otariidae & Obodenidae In-water	Sea lions and Fur seals	206 dB re 1µPa2-sec(O_{WI})	220 dB re 1µPa2-sec(O_{WI})
Mustelidae In-water	Sea Otters		

LF_{II}, MF_{II}, HF_{II}: New compound Type II weighting functions; P_{WI}, O_{WI}: Original Type I (Southall et al. 2007) for pinniped and mustelid in water.

[8] Southall et al. notes: "Noise-induced PTS represents tissue injury, but TTS does not. Although TTS involves reduced hearing sensitivity following exposure, it results primarily from the fatigue (as opposed to loss) of cochlear hair cells and supporting structures and is, by definition, reversible (Nordmann et al., 2000)."

Table 6-2: Impulsive Sound and Explosive Criteria and Thresholds for Predicting Physiological Effects on Marine Mammals

Group	Species	Behavior		Slight Injury			Mortality
		Behavioral (for ≥2 pulses/24 hrs)	TTS	PTS	GI Tract	Lung	
Low Frequency Cetaceans	All mysticetes	167 dB SEL (LF_{II})	172 dB SEL (LF_{II}) or 224 dB Peak SPL	187 dB SEL (LF_{II}) or 230 dB Peak SPL	237 dB SPL or 104 psi	Equation 1	Equation 2
Mid-Frequency Cetaceans	Most delphinids, medium and large toothed whales	167 dB SEL (MF_{II})	172 dB SEL (MF_{II}) or 224 dB Peak SPL	187 dB SEL (MF_{II}) or 230 dB Peak SPL			
High Frequency Cetaceans	Porpoises and *Kogia* spp.	141 dB SEL (HF_{II})	146 dB SEL (HF_{II}) or 195 dB Peak SPL	161 dB SEL (HF_{II}) or 201dB Peak SPL			
Phocidae	Hawaiian monk, elephant, and harbor seal	172 dB SEL (P_{WI})	177 dB SEL (P_{WI}) or 212 dB Peak SPL	192 dB SEL (P_{WI}) or 218 dB Peak SPL			
Otariidae	Sea lions and Fur seals	195 dB SEL (O_{WI})	200 dB SEL (O_{WI}) or 212 dB Peak SPL	215 dB SEL (O_{WI}) or 218 dB Peak SPL			
Mustelidae	Sea Otters						

(1) $-39.1M^{1/3}\left(1+\frac{D_{Rm}}{10.081}\right)^{1/2} Pa-\text{sec}$ (2) $-91.4M^{1/3}\left(1+\frac{D_{Rm}}{10.081}\right)^{1/2} Pa-\text{sec}$

M = mass of the animals in kg
Drm = depth of the receiver (animal) in meters
SEL = re 1µPa2-sec); SPL = re 1µPa

Table 6-4: Pile Driving and AirgunThresholds Used in this Analysis to Predict Effects on Marine Mammals

Species Groups	Underwater Vibratory Pile Driving Criteria (sound pressure level, dB re 1 µPa)		Underwater Impact Pile Driving and Airgun Criteria (sound pressure level, dB re 1 µPa)	
	Level B Disturbance Threshold	Level A Injury Threshold	Level B Disturbance Threshold	Level A Injury Threshold
Cetaceans (whales, dolphins, porpoises)	120 dB rms	180 dB rms	160 dB rms	180 dB rms
Pinnipeds (seals, sea lions)	120 dB rms	190 dB rms	160 dB rms	190 dB rms

rms = Root Mean Square (also RMS) and refers to 90% of the energy under the envelope.

The behavioral harassments thresholds for non-impulsive sound (including sonar) are more complex; these are depicted in Exhibit 13 (DEIS Appendix C, Criteria and Thresholds for U.S. Navy Acoustic and Explosive Effects Analysis, Table C-1). For most species, behavioral Level B harassments are shown as a function (i.e., behavioral risk function), rather than a fixed

number, with two exceptions: beaked whales, for which 140 dB is listed as the threshold, and harbor porpoises, which are not found in the SOCAL area. The Navy describes the behavioral risk function as follows:

> *The behavioral risk function predicts a probability of a substantive behavioral reaction for individuals exposed to a received sound pressure level of 120 dB re 1µPa or greater, with an increasing probability of reaction with increased received level as demonstrated in Melcón et al. (2012).*

Also, to assist in the understanding of the behavioral risk thresholds, the Navy has provided charts depicting 6 dB increments of sound and the percentages of behavioral harassments falling within each increment (LOA request, Table 6-10) (Exhibit 14). For example, the portion of the table depicted below shows, for the loudest sonar source, that approximately 83% of behavioral harassments involving both low- and mid-frequency cetaceans would occur at approximately 8.7-53.9 km from the sound source, with received level of between 156-162 dB.

Received Level	Sonar Bin MF1 (e.g., SQS-53; ASW Hull Mounted Sonar)		Sonar Bin MF4 (e.g., AQS-22; ASW Dipping Sonar)	
	Distance at Which Levels Occur Within Radius of Source (m)	Percentage of Behavioral Harassments Occurring at Given Levels	Distance at Which Levels Occur Within Radius of Source (m)	Percentage of Behavioral Harassments Occurring at Given Levels
Low Frequency Cetaceans				
120 ≤SPL <126	172,558 – 162,925	0.00%	40,000 – 40,000	0.00%
126 ≤SPL <132	162,925 – 117,783	0.00%	40,000 – 40,000	0.00%
132 ≤SPL <138	117,783 – 108,733	0.04%	40,000 – 12,975	3.03%
138 ≤SPL <144	108,733 – 77,850	1.57%	12,975 – 12,800	0.14%
144 ≤SPL <150	77,850 – 58,400	5.32%	12,800 – 6,525	27.86%
150 ≤SPL <156	58,400 – 53,942	4.70%	6,525 – 2,875	36.83%
156 ≤SPL <162	53,942 – 8,733	83.14%	2,875 – 1,088	23.78%
162 ≤SPL <168	8,733 – 4,308	3.51%	1,088 - 205	7.94%
168 ≤SPL <174	4,308 – 1,950	1.31%	205 - 105	0.32%
174 ≤SPL <180	1,950 - 850	0.33%	105 - 55	0.10%
180 ≤SPL <186	850 - 400	0.06%	55 - <50	0.01%
186 ≤SPL <192	400 - 200	0.01%	<50	0.00%
192 ≤ SPL <198	200 - 100	0.00%	<50	0.00%
Mid-Frequency Cetaceans				
120 ≤ SPL <126	172,592 – 162,933	0.00%	40,000 – 40,000	0.00%
126 ≤ SPL <132	162,933 – 124,867	0.00%	40,000 – 40,000	0.00%
132 ≤ SPL <138	124,867 – 108,742	0.07%	40,000 – 12,975	2.88%
138 ≤ SPL <144	108,742 – 78,433	1.54%	12,975 – 12,950	0.02%
144 ≤ SPL <150	78,433 – 58,650	5.41%	12,950 – 6,725	26.73%
150 ≤ SPL <156	58,650 – 53,950	4.94%	6,725 – 3,038	36.71%
156 ≤ SPL <162	53,950 – 8,925	82.62%	3,038 – 1,088	25.65%
162 ≤ SPL <168	8,925 – 4,375	3.66%	1,088 - 255	7.39%
168 ≤ SPL <174	4,375 – 1,992	1.34%	255 - 105	0.52%
174 ≤ SPL <180	1,992 - 858	0.34%	105 - 55	0.09%
180 ≤ SPL <186	858 - 408	0.06%	55 - <50	0.01%
186 ≤ SPL <192	408 - 200	0.01%	<50	0.00%
192 ≤ SPL <198	200 - 100	0.00%	<50	0.00%

ASW: anti-submarine warfare; MIW: mine warfare; m: meter; SPL: sound pressure level

Notwithstanding the fairly large numbers of Level B harassments, the Navy concludes (consistency determination, p. 54) as follows:

> ***Impacts from Sonar and Other Active Acoustical Sources***
> *The majority of predicted Level B exposures of marine mammals from sonar and other active acoustic sources are associated with major training exercises. These major training exercises are multi-day events composed of multiple, dispersed activities involving multiple platforms (i.e., vessels, aircraft, and submarines) that often require movement across or use of large areas of a range complex. Potential acoustic impacts of major training exercises, especially behavioral impacts, could be more pronounced given the duration and scale of the activity. Some animals may be exposed to this activity multiple times over the course of a few days and leave the area, although these activities do not use the same training locations day-after-day during multi-day activities. Therefore, displaced animals could return after the major training exercise moves away, allowing the animal to recover from any energy expenditure or missed resources.*
>
> *In the ocean, the use of sonar and other active acoustic sources is transient and is unlikely to repeatedly expose the same population of animals over a short period. Around heavily trafficked Navy ports and on fixed ranges, the possibility is greater for animals that are resident during all or part of the year to be exposed multiple times to sonar and other active acoustic sources. A few behavioral reactions per year, even from a single individual, are unlikely to produce long-term consequences for that individual or the population. Furthermore, mitigation measures discussed in Appendix C (Standard Operating Procedures, Mitigation, and Monitoring) would further reduce the predicted impacts.*

Dolphin Mortality from Underwater Explosives

During Navy underwater explosives testing in March 2011, in nearshore waters at the SSTC off Coronado, several dolphins died during a Navy exercise using a timed explosive. NMFS describes the event as follows:

> *During a Navy training event on March 4, 2011 at the Silver Strand Training Complex in San Diego, California, three or possibly four dolphins were killed in an explosion. During an underwater detonation training event, a pod of 100 to 150 long-beaked common dolphins were observed moving towards the 700-yd (640.1-m) exclusion zone around the explosive charge, monitored by personnel in a safety boat and participants in a dive boat. Approximately 5 minutes remained on a time-delay fuse connected to a single 8.76 lb (3.97 kg) explosive charge (C-4 and detonation cord). Although the dive boat was placed between the pod and the explosive in an effort to guide the dolphins away from the area, that effort was unsuccessful and three longbeaked common dolphins near the explosion died. In addition to the three dolphins found dead on March 4, the remains of a fourth dolphin were discovered on March 7, 2011 near Ocean Beach, California (3 days later and approximately 11.8 mi. [19 km] from Silver Strand where the training event occurred), which might also have been related to this event. Association of the fourth stranding with the training event is uncertain because dolphins strand on a*

regular basis in the San Diego area. Details such as the dolphins' depth and distance from the explosive at the time of the detonation could not be estimated from the 250 yd (228.6 m) standoff point of the observers in the dive boat or the safety boat.

These dolphin mortalities are the only known occurrence of a U.S. Navy training or testing event involving impulse energy (underwater detonation) that caused mortality or injury to a marine mammal. Despite this being a rare occurrence, the Navy has reviewed training requirements, safety procedures, and possible mitigation measures and implemented changes to reduce the potential for this to occur in the future. Discussions of procedures associated with these and other training and testing events are presented in the Mitigation section.

In response to the incident, the Navy ceased this type of testing (nationwide) until it could develop improved monitoring to further reduce the potential for such mortalities. Exhibit 15 depicts the changes the Navy has implemented, which include: (1) increased size of the area to be monitored (from 700 yds. to 1000 yds.); (2) reduced timer delay duration (from 15 mins. to 10 mins.); and (3) altering the monitoring boat movements around the charges to increase visual coverage. In response to questions from the Commission staff, the Navy states it would adversely affect training "realism" to implement what it calls "positive controls" (i.e. the ability to stop the detonation timer once initiated) for a timed delay fuse. The Navy's November 10, 2011, post incident report (to NMFS) elaborates on the safety problems that would be caused by attempting to combine positive control with timer delays:

Types of Detonation Initiating Devices

*The Navy uses both timed-delayed and positive control to initiate a particular underwater detonation depending on the training event in question (**Table 1-2**) and in particular, the training objectives applicable to that underwater detonation. The time-delay firing is called the Timed Delay Firing Device (TDFD). …*

It is not sound safety principles or good demolition practice to combine different firing circuits to a demolition charge. For instance, in a live mine field, Navy dive platoons expect there to be additional risks, such as unknown mines with different types of influence firing circuits (i.e., detonated by contact, magnetic field, or certain sounds) in close proximity to a mine they are trying to destroy. The use of a TDFD reduces these risks by limiting the possibility of an unintentionally triggering detonation from unknown mine types. Underwater demolition needs to be kept as simple and streamlined as possible, especially when divers and influence ordinance are considered. In an open ocean environment, universal use of RFDs [Radio Firing Devices] *would greatly increase the risk of misfire due to component failure, and put unnecessary stress on all needed connections and devices (adding 600 – 1,000 feet of firing wire; building/deploying and improvised, bulky, floating system for the RFD receiver; adding another 180 feet of detonating cord plus 10 feet of additional material).*

> *RFDs, therefore, are not considered a practicable alternative for all underwater detonations. While positive control devices do allow for instantaneous detonation of a charge and are used for some SSTC training events, exclusive use of RFD introduce operationally unsound tactics, thereby increasing future risks to Navy dive teams. It is essential that EOD and NSW platoons qualify annually with necessary time-delay certification, maintain proficiency, and train to face real-world scenarios that require use of TDFDs.*

The Navy's consistency determination (p.55) also reflects that the Navy has included in its LOA application to NMFS an estimated take (mortality) based on these types of potential occurrences, stating:

> *Modeling results and the record of having conducted the same or similar events for decades indicates injuries and mortality are unlikely. Given the short radii for the impact zones, range clearance procedures, and that it is unlikely for marine mammals to be in the area also suggests injuries and mortality are unlikely. Although the incident at SSTC on 4 March 2011… involving long-beaked common dolphins was an unfortunate and extremely rare incident (given that it has never occurred before), it remains extremely unlikely that a similar event involving the use of explosives in a training event would re-occur. Given this one occurrence, however, the Navy will request authorization under the MMPA for the annual incidental mortality of 26 small odontocetes (e.g., dolphins) or pinnipeds associated with Navy training and testing activities using explosives in the Study Area.*

Vessel Strikes

According to NMFS' Proposed Rule, 16 Navy vessel strikes have occurred in SOCAL over the past 20 years (1991-2010). For Navy vessel strikes in SOCAL, NMFS reports six consecutive 5-year periods with six or more whales struck (1997-2001, 1998-2002, 1999-2003, 2000-2004, 2001-2005, and 2002-2006), and no more than three whales struck in the last 5-year period from 2006-2010. No whales have been struck by Navy vessels in SOCAL since 2009. The Navy's consistency determination, p. 58, states:

> *Navy policy … is to report all whale strikes by Navy vessels. That information has been, by informal agreement, provided to National Oceanographic and Atmospheric Administration on an annual basis. Only the Navy and the U.S. Coast Guard report vessel strikes in this manner, so all statistics are skewed by a lack of comprehensive reporting by all vessels that may experience vessel strikes.*
>
> *Based on NMFS Southwest Regional Office data for Southern California, gray whales have the highest number of recorded strikes (and in all of California as well), with fin and humpback whales notably less, and blue whales the least. In the SOCAL Range Complex, the Navy has struck 16 marine mammals in a 20-year period (1991-2010) for an average of one per year (although statistically 0.8 per year [16 strikes/20 years]). In 16 of the last 20 years, there were zero to one whale strikes.*

The Navy does not anticipate ship strikes of marine mammals within the Study Area from training and testing activities under the Proposed Action. However, to account for the accidental nature of ship strikes in general, and the potential risk from any vessel movement within the Study Area, the Navy is seeking take authorization in the event a Navy ship strike does occur within the Study Area during the five-year period of NMFS' final authorization. Based on the probabilities of whale strikes suggested by the data, the Navy is requesting takes by morality or injury of 15 large marine mammals over the five years of the NMFS authorization. This level of take would be no more than four large whales in any given year.

Strandings

NMFS' Proposed Rule summarizes the available evidence linking mid-frequency military sonar to beaked whale and other marine mammal stranding events. Excerpts include:

Over the past 16 years, there have been five stranding events coincident with military mid-frequency sonar use in which exposure to sonar is believed to have been a contributing factor: Greece (1996); the Bahamas (2000); Madeira (2000); Canary Islands (2002); and Spain (2006). Additionally, in 2004, during the Rim of the Pacific (RIMPAC) exercises, between 150 and 200 usually pelagic melon-headed whales occupied the shallow waters of Hanalei Bay, Kauai, Hawaii for over 28 hours. NMFS determined that MFAS was a plausible, if not likely, contributing factor in what may have been a confluence of events that led to the stranding.

…

Several sources have published lists of mass stranding events of cetaceans in an attempt to identify relationships between those stranding events and military sonar (Hildebrand, 2004; IWC, 2005; Taylor et al., 2004). For example, based on a review of stranding records between 1960 and 1995, the International Whaling Commission (2005) identified ten mass stranding events of Cuvier's beaked whales had been reported and one mass stranding of four Baird's beaked whale. The IWC concluded that, out of eight stranding events reported from the mid- 1980s to the summer of 2003, seven had been coincident with the use of tactical mid-frequency sonar, one of those seven had been associated with the use of tactical low-frequency sonar, and the remaining stranding event had been associated with the use of seismic airguns. Most of the stranding events reviewed by the International Whaling Commission involved beaked whales. …

Naval activities (not just activities conducted by the U.S. Navy) that might have involved active sonar are reported to have coincided with nine or 10 (13 to 14 percent) of those stranding events. Between the mid-1980s and 2003 (the period reported by the International Whaling Commission), we identified reports of 44 mass cetacean stranding events of which at least seven were coincident with naval exercises that were using MFAS.

Mitigation Measures

The Navy states (consistency determination, p. 66) that while "…some activities could have temporary and local effects to California coastal zone uses and resources …, no population-level effects would be expected as a result of the Proposed Action" and that any effects would be reduced through its adherence "…to standard operating procedures and implementing environmental mitigation measures, as described in Appendix C of the Navy's Consistency Determination (Standard Operating Procedures, Mitigation, and Monitoring)." The chart below, last column, depicts the various avoidance and shutdown protocols that would be in place for the intensive active acoustic sources likely to cause Level A and B harassments:

Table 11-1: Predicted Maximum Ranges to Permanent Threshold Shift and Recommended Buffer Zones

Activity Category	Representative Source (Bin)*	Predicted Average Range to TTS	Predicted Average Range to PTS	Predicted Maximum Range to PTS	Recommended Mitigation Zone
Non-Impulsive Sound					
Low-Frequency and Hull-Mounted Mid-Frequency Active Sonar	SQS-53 ASW hull-mounted sonar (MF1)	4,251 yd. (3,887 m)	281 yd. (257 m)	<292 yd. (<267 m)	6 dB power down at 1,000 yd. (914 m); 4 dB power down at 500 yd. (457 m); and shutdown at 200 yd. (183 m)
High-Frequency and Non-Hull Mounted Mid-Frequency Active Sonar	AQS-22 ASW dipping sonar (MF4)	226 yd. (207 m)	<55 yd. (<50 m)	<55 yd. (<50 m)	200 yd. (183 m)
Explosive and Impulsive Sound					
Improved Extended Echo Ranging Sonobuoys	Explosive sonobuoy (E4)	434 yd. (397 m)	156 yd. (143 m)	563 yd. (515 m)	600 yd. (549 m)
Explosive Sonobuoys using 0.6–2.5 lb. NEW	Explosive sonobuoy (E3)	290 yd. (265 m)	113 yd. (103 m)	309 yd. (283 m)	350 yd. (320 m)
Anti-Swimmer Grenades	Up to 0.5 lb. NEW (E2)	190 yd. (174 m)	83 yd. (76 m)	182 yd. (167 m)	200 yd. (183 m)
Mine Countermeasure and Neutralization Activities Using Positive Control Firing Devices	NEW dependent (see Table 5.3-3)				
Mine Neutralization Diver Placed Mines Using Time-Delay Firing Devices	Up to 20 lb. NEW (E6)	647 yd. (592 m)	232 yd. (212 m)	469 yd. (429 m)	1,000 yd. (915 m)
Ordnance Testing (Line Charge Testing)	Numerous 5 lb. charges (E4)	434 yd. (397 m)	156 yd. (143 m)	563 yd. (515 m)	900 yd. (823 m)**
Gunnery Exercises – Small- and Medium-Caliber (Surface Target)	40 mm projectile (E2)	190 yd. (174 m)	83 yd. (76 m)	182 yd. (167 m)	200 yd. (183 m)
Gunnery Exercises – Large-Caliber (Surface Target)	5 in. projectiles (E5 at the surface***)	453 yd. (414 m)	186 yd. (170 m)	526 yd. (481 m)	600 yd. (549 m)
Missile Exercises up to 250 lb. NEW (Surface Target)	Maverick missile (E9)	949 yd. (868 m)	398 yd. (364 m)	699 yd. (639 m)	900 yd. (823 m)
Missile Exercises up to 500 lb. NEW (Surface Target)	Harpoon missile (E10)	1,832 yd. (1,675 m)	731 yd. (668 m)	1,883 yd. (1,721 m)	2,000 yd. (1.8 km)
Bombing Exercises	MK-84 2,000 lb. bomb (E12)	2,513 yd. (2.3 km)	991 yd. (906 m)	2,474 yd. (2.3 km)	2,500 yd. (2.3 km)**
Torpedo (Explosive) Testing	MK-48 torpedo (E11)	1,632 yd. (1.5 km)	697 yd. (637 m)	2,021 yd. (1.8 km)	2,100 yd. (1.9 km)
Sinking Exercises	Various sources up to the MK-84 2,000 lb. bomb (E12)	2,513 yd. (2.3 km)	991 yd. (906 m)	2,474 yd. (2.3 km)	2.5 nm
At-Sea Explosive Testing	Various sources less than 10 lb. NEW (E5 at various depths***)	525 yd. (480 m)	204 yd. (187 m)	649 yd. (593 m)	1,600 yd. (1.4 km)**
Elevated Causeway System – Pile Driving	24 in. steel impact hammer	1,094 yd. (1,000 m)	51 yd. (46 m)	51 yd. (46 m)	60 yd. (55 m)

ASW: anti-submarine warfare; JAX: Jacksonville; NEW: net explosive weight; PTS: permanent threshold shift; TTS: temporary threshold shift;
* This table does not provide an inclusive list of source bins; bins presented here represent the source bin with the largest range to effects within the given activity category.
** Recommended mitigation zones are larger than the modeled injury zones to account for multiple types of sources or charges being used.
*** The representative source bin E5 has different range to effects depending on the depth of activity occurrence (at the surface or at various depths).

Sea Turtles and Other Marine Species

Concerning potential effects to the five sea turtle species in the project area (all listed as endangered under the ESA), the Navy predicts impacts to only one species, the green sea turtle [*Chelonia mydas*]. Based on its modeling the Navy predicts its testing (with no effects resulting

from training) would generate the following TTS and PTS "takes" under the MMPA (Table 3-3, Navy consistency determination, p. 22):

Table 3-3: Total Annual Model-Predicted Impacts on Sea Turtles of Testing Activities using Sonar or Other Active Non-Impulsive Acoustic Sources in the Study Area

Sea Turtle Species	Baseline		Proposed Action	
	Temporary Threshold Shift	Permanent Threshold Shift	Temporary Threshold Shift	Permanent Threshold Shift
Green sea turtle	549	119	616	97

Notes: The timing, locations, and numbers of these activities would not substantially differ from year to year under each alternative.

At the same time, the Navy's consistency determination states (p. 23) that sea turtle impacts would be minimal for the following reasons:

> *Because model-predicted impacts are conservative and most impacts would be short-term, potential impacts are not expected to result in substantial changes in behavior, growth, survival, annual reproductive success, lifetime reproductive success (fitness), or species recruitment. Although some individuals could experience long-term impacts, population-level impacts are not expected. The predicted impacts do not account for avoidance behavior at close range or for high sound levels approaching those that could cause a permanent threshold shift (PTS). Furthermore, cues preceding the event (e.g., vessel presence and movement, aircraft overflight) may cause some animals to leave the area before active sound sources begin transmitting. Avoidance behavior could reduce the sound exposure level experienced by a sea turtle, and therefore reduce the likelihood and degree of PTS and TTS predicted near sound sources. In addition, PTS and TTS threshold criteria for sea turtles are conservatively based on criteria developed for mid-frequency marine mammals. Therefore, actual PTS and TTS impacts are expected to be substantially less than the predicted quantities.*

Concerning effects on sea turtles from other stressors (i.e., explosives, pile driving (which includes monitoring and avoiding effects on sea turtles), swimmer defense airguns, weapons firing, vessels and vessel noise, aircraft noise, disposal of parachutes, and other activities), the Navy states that risks would be low, with no long-term or population level impacts (consistency determination, pp. 22-30.

The Navy also anticipates that impacts would be low to sensitive marine vegetative habitats (e.g., kelp beds), seabirds (including several listed species), and commercial and recreational fish stocks to be low, with no long-term or population level impacts (consistency determination pp. 30-45).

Monitoring

NMFS (Proposed Rule, FR 1/31/13, pp. 7108-7109) (Exhibit 12) summarizes past Navy monitoring efforts in SOCAL and Hawaii. NMFS reports that the Navy has taken "significant initiative" in developing its marine species monitoring program, and has made "considerable progress toward reaching goals and objectives of …" an Integrated Comprehensive Monitoring Program (ICMP). NMFS states the on-board watchstanders information is "generally useful to indicate the presence or absence of marine mammals within the mitigation zones (and sometimes beyond)" but that it "… does not provide useful species-specific information or behavioral data." Although somewhat equivocal, NMFS states:

> *Though it is by no means conclusive, it is worth noting that no instances of obvious behavioral disturbance have been observed by Navy watchstanders or experienced marine mammal observers conducting visual monitoring.*

NMFS also states that while the observations do provide useful and valuable information, it cannot be relied upon for a thorough understanding of the overall distributions and abundance of marine mammals. NMFS therefore states:

> *NMFS and the Navy should more carefully consider what and how information should be gathered by watchstanders during training exercises and monitoring events, as some reports contain different information, making cross-report comparisons difficult.*

NMFS further notes that the Navy has:

- *Conducted over 4,000 hours of visual survey effort;*
- *Covered over 64,800 nautical miles of ocean;*
- *Sighted over 256,000 individual marine mammals;*
- *Taken over 45,500 digital photos and 32 hours of digital video;*
- *Attached 70 satellite tracking tags to individual marine mammals; and*
- *Collected over 25,000 hours of passive acoustic recordings.*

NMFS concludes, concerning past monitoring:

> *Data collection and analysis within these range complexes is ongoing. From 2009 to 2011, Navy lookouts aboard Navy ships reported 1,262 sightings for an estimated 12,875 marine mammals within the HSTT Study Area. These observations were mainly during major at-sea training events and there were no reported observations of adverse reactions by marine mammals and no dead or injured animals reported associated with Navy training activities.*

NMFS' (Proposed Rule, FR 1/31/13, pp. 7018-7019) also describes extensive future Navy integrated monitoring programs, which will include, in concert with NMFS, development of adaptive management strategy, modifications to mitigation measures if warranted, and the continuing extensive Navy- funded research efforts which benefit the understanding of the marine environment in general and the effects of sound on it. NMFS notes:

> *From 2004 to 2012, the Navy has provided over $230 million for marine species research. The Navy sponsors 70 percent of all U.S. research concerning the effects of human-generated sound on marine mammals and 50 percent of such research conducted worldwide.*

NMFS Tentative Conclusion
In its Proposed Rule (FR 1/31/13, p. 7040) for the combined California and Hawaii Programs (i.e., it provides one conclusion covering both programs), and which is currently open for public comment, NMFS has issued the following preliminary determination:

> *Based on the analysis contained herein of the likely effects of the specified activity on marine mammals and their habitat and dependent upon the implementation of the mitigation and monitoring measures, NMFS preliminarily finds that the total taking from Navy training and testing exercises in the HSTT Study Area will have a negligible impact on the affected species or stocks. NMFS has proposed regulations for these exercises that prescribe the means of effecting the least practicable adverse impact on marine mammals and their habitat and set forth requirements pertaining to the monitoring and reporting of that taking.*

Navy Conclusion
In its application to NMFS, the Navy states, for the entire HSTT program (LOA request, p. 148):

> *Based on this research, monitoring before, during, and after training and testing events since 2006, and the reports that have been submitted to and reviewed by NMFS, the Navy's assessment is that it is unlikely there will be impacts to populations of marine mammals (such as whales, dolphins and porpoise, seals and sea lions) having any long term consequences as a result of the proposed continuation of training and testing in the ocean areas historically used by the Navy.*
>
> *This assessment of likelihood is based on four indicators from areas in the Pacific where Navy training and testing has been ongoing for decades; (1) evidence suggesting or documenting increases in the numbers of marine mammals present; (2) examples of documented presence and site fidelity of species and long-term residence by individual animals of some species; (3) use of training and testing areas for breeding and nursing activities; and (4) six years of comprehensive monitoring data indicating a lack of any observable effects to marine mammal populations as a result of Navy training and testing activities. Citations to evidence indicative of increases and/or viability of marine mammal populations are not meant to suggest that Navy training and testing events are beneficial to marine mammals. There is, however, no direct evidence from HRC or SOCAL suggesting Navy training and testing has had or may have any long term consequences to marine mammals and therefore baring any evidence to the contrary, what limited and preliminary evidence there is should be considered. This is especially the case given the widespread public misperception that Navy training and testing, especially involving use of mid-frequency sonar, will cause countless numbers of marine mammals to be injured or die. Examples to the contrary where the Navy has conducted training and testing activities for decades include the following.*
>
> *Work by Moore and Barlow (2011) indicate that since 1991, there is strong evidence of increasing fin whale abundance in the California Current area, which includes the SOCAL Range Complex. They predict continued increases in fin whale numbers over the*

next decade, and that perhaps fin whale densities are reaching "current ecosystem limits".

…

In SOCAL, based on a series of surveys from 2006 to 2008 and the high number encounter rate, Falcone et al. (2009) proposed that their observations suggested the ocean basin west of San Clemente Island may be an important region for Cuvier's beaked whales. For over three decades, the ocean area west of San Clemente has been the location of the Navy's instrumented training range and is one of the most intensively used training and testing areas in the Pacific, given the proximity to the Naval installations in San Diego.

To reiterate, while the evidence is limited to a few species and only suggestive of the general viability of those species, there is no direct evidence that routine Navy training and testing spanning decades has negatively impacted those species. Therefore, based on the best available science, Navy believes that long-term consequences for individuals or populations are unlikely to result from Navy training and testing activities.

In its consistency determination, the Navy concludes, for the California portion of the program:

The Navy conducted an effects test to analyze how and to what degree the Proposed Action would affect California coastal zone uses and resources, as defined in the applicable, enforceable policies. Results of the effects test, which considered training and testing activities that could occur within the coastal zone and activities that occur outside the coastal zone but could affect coastal zone resources, indicate that some activities could have temporary and local effects to California coastal zone uses and resources. Although some individual biological organisms may be affected, no population-level effects would be expected as a result of the Proposed Action. The Navy would reduce the potential impacts of its proposed activities on coastal zone uses and resources by adhering to standard operating procedures and implementing environmental mitigation measures, as described in Appendix C of this Consistency Determination (Standard Operating Procedures, Mitigation, and Monitoring).

In addition, the Navy is consulting with NMFS for ESA-listed marine mammals, sea turtles, steelhead trout, and abalones, and informally with USFWS for ESA-listed seabirds. The Navy anticipates their concurrence on its Not Likely to Adversely Affect determinations for black abalone, white abalone, and steelhead trout, as well as for designated critical habitat for black abalone and steelhead trout.

Therefore, the Navy is consistent to the maximum extent practicable with the enforceable policies of the California Coastal Management Program.

Commission Conclusion

As discussed on pages 1~~86~~-2~~18~~ above, the Commission disagrees with the Navy's assumption that only 10 marine mammal species are coastal zone species. The Commission also disagrees with the Navy that a conclusion can be made that the current level of activities, much less the significant increases proposed for California, would not have population-level effects, for several reasons. First, for all the populations of affected marine mammals, it is simply impossible to establish whether population level effects have been occurring, or would occur with the increased levels, given that the Navy has been using this technology in this area consistently for the past 40 years. As the study discussed below notes: "High densities are not obviously consistent with a hypothesis that declines are due to military sonar, but they do not refute the possibility that declines have occurred in these areas (i.e., that densities were previously even higher)."

Second, the recently-published study from which the above quote was taken, "Declining Abundance of Beaked Whales (Family Ziphiidae) in the California Current Large Marine Ecosystem" (Moore and Barlow, January 2013), poses a hypothesis that military sonar *could* be resulting in potential population-level effects for several species of beaked whales, which are the SOCAL species *most* sensitive to mid-frequency sonar, *most* likely to incur mortalities by stranding, and *most* difficult to detect by on-board observers. According to the Navy's information (Table 6-10 – Exhibit 14), the distance to the behavioral reaction threshold level for beaked whales (i.e., 140 dB Received Level) would be in the 80-100 km range, which is an area clearly impossible for on-board watchstanders to observe. The abstract of this Moore and Barlow study states that the existing data "… provide strong evidence of declining beaked whale abundance in the study area," which consists of the eastern Pacific (i.e., off the coasts of California, Oregon, and Washington). The study examines three potential hypotheses to explain such declines: (1) mortality from fishing; (2) Navy sonar and other anthropogenic noise; and (3) ecosystem change. The study rules out mortality from fishing as an "unlikely" cause, due to low bycatch rates. The study acknowledges the previously-discussed known links between beaked whale strandings and military sonar, but states that:

> *Although the threats from naval acoustic activity have been described, population-level impacts have not been quantified. Mass strandings of beaked whales throughout the Northern Hemisphere have been associated with offshore military activity, but estimates of total mortality associated with these types of impacts do not exist. Certainly they exceed levels that have been recorded, however, since the probability of observing dead whales is generally low, especially for deep-water species [46]–[48].*

The study goes on to say that the "…evidence to implicate noise from naval activity or other acoustic sources as a cause of apparent beaked whale declines in the California Current is equivocal," and, therefore, that insufficient data are available to make definitive conclusions. The study notes the high densities of beaked whales at the Navy training range SOAR. But it states, again, that:

> *High densities are not obviously consistent with a hypothesis that declines are due to military sonar, but they do not refute the possibility that declines have occurred in these areas (i.e., that densities were previously even higher). Navy ranges occurring in high-quality beaked whale habitat could also act as population sinks where sonar-habituated adults persist but recruitment is compromised through direct or indirect mechanisms. Disproportionately high frequencies of immature animals occurring in mass stranding events associated with anthropogenic activities [55] provide some albeit inconclusive support of this hypothesis. Densities of M. densirostris in the Abaco Island area, 100 km north of the AUTEC range, appear to have remained stable from 1998–2011 [56], suggesting that, at least for this species in the Bahamas region, any potential negative effects of navy sonar may have a limited geographic reach. However, major differences in deepwater canyon bathymetry and spatial dynamics of naval operations between AUTEC and SOAR (e.g., active sonar operations in the Southern California Bight can occur well outside of SOAR) make it difficult to extend inference for Mesoplodon in the Bahamas to Mesoplodon and Z. cavirostris in the California Current.*

Concerning the third hypothesis posed, the study again concludes that data are lacking to enable assessment of the impacts of ecosystem change (and trophic dynamics) and recommends additional research, stating:

> ***Summary and research recommendations***
>
> *The abundance of Ziphius and especially Mesoplodon beaked whales appears to have declined in the California Current since the early 1990s. This inference was made possible through a Bayesian hierarchical modeling approach. Drivers of apparent population declines are unknown, although direct fisheries (bycatch) impacts can probably be ruled out. Impacts from anthropogenic noise and human-mediated or other ecosystem change are plausible explanations, but additional research is required to more thoroughly evaluate these hypotheses.*
>
> *Dedicated survey effort to estimate trends in the Navy SOAR area of the Southern California Bight and in additional control areas would help test hypotheses concerning the effects of naval sonar on trends. Comparisons of population age structure based on mark-resight data would also be insightful, while data on individual movement patterns would provide complementary information about the potential geographic reach of local impacts at SOAR to other areas of the system.*

Even if the Navy's conclusion *were* supportable concerning a lack of population-level effects, the Commission notes that it is only one of the tests of Section 30230. The Commission finds, as it did in 2008, that compliance with Section 30230 also requires enhancement (and where feasible restoration) of the overall marine environment, as well as special protection for areas and species of special biological or economic significance. These requirements have led the Commission to previously determine that they require the avoidance of the use of very loud active acoustics in biologically important and sensitive areas, in particular areas of high, or seasonally high, concentrations of marine mammals. The fact that the Navy is proposing to significantly increase the levels of activities likely to cause harm to the marine mammals,

combined with the beaked whale and blue whale research results discussed above that have been published since the Commission's last review, which confirmed the Commission's belief that lower thresholds were appropriate (and which the Navy and NMFS have now acknowledged)), only confirm the concerns the Commission has historically raised ~~over the need for additional restrictions~~.

Moreover, the Navy's purported conclusion, based on its monitoring, of a "lack of observable effects" is unconvincing and is contradicted by more scientific studies designed to more comprehensively measure marine mammal reactions to military sonar and military-like sonar sounds. These research efforts have been intentionally conducted in areas where the Navy trains such as SOCAL and the Bahamas (at Atlantic Undersea Test and Evaluation Center (AUTEC). To date (and the research efforts are continuing), the studies (such as those discussed on pages 2~~8~~4-29~~6~~ above) have documented marine mammal reactions at sound levels far below the exposures the louder sources would generate. In addition, the notes that the Navy's own model inherently *assumes* mammal avoidance responses, when in the final application of mitigation measures to the "take" estimates it assumes most Permanent Threshold Shifts will be reduced to Temporary Threshold Shits, based on the assumption that animals will hear the sound and move away from the source. If animals are moving away from the source while engaged in biologically significant behaviors such as feeding or mating, then those reactions would in and of themselves be considered overt adverse reactions caused by the sonar. Therefore, the Commission is even more convinced than it was five years ago by the currently available data that that the Navy needs to consider and analyze such alternatives as additional avoidance, monitoring, and mitigation measures, before the Commission could determine ~~are necessary to enable it to find~~whether the proposed increased training and testing measures would be consistent with the requirements of Section 30230.

In sum, the Commission does not believe that the Navy has demonstrated that the proposed activity with have no population-level effects. However, even if this could be demonstrated, population-level effects are only part of the analysis. Looking at impacts more generally, and even hypothetically limiting the analysis to the ten species that the Navy determines are coastal resources, and using its own data estimates, that data demonstrates a significant negative impact on coastal resources, in the form of 477,000 Level B annual harassment, and 94 Level A annual harassments (with no mortalities). Under the Commission's interpretation of coastal species, the numbers would increase to 1.78 million Level B annual harassments and 336 Level A annual harassments (and up to 26 mortalities). Under either estimate, the Commission does not have sufficient information to determine that the activity would ~~not~~ maintain, enhance, or restored marine resources. The Commission also notes that the Navy has not provided the type of population-level analysis Pacific Gas and Electric Company (PG&E) had provided in its high energy seismic survey consistency certification (CC-027-12) (described on the following page (Item No. 3)~~, and would be inconsistent with 30230~~. Moreover, the Navy's own data indicate that some additional species are in the coastal zone "occasionally," and thus, by its own approach, more species would need to be considered, heightening the evidence of inconsistency. ~~When looking at all of the species that the Coastal Commission considers to be coastal resources, this conclusion is even clearer.~~

In conclusion, the Commission finds that the Navy's consistency determination lacks sufficient information to enable it to determine consistency with the marine resource policy (Section 30230) for the following reasons:

1) The Navy's analysis relied on an incomplete analysis of the requirements of Section 30230, in that it only looked at one of the three tests (population-level effects), ignoring requirements of Section 30230 for the maintenance, enhancement, and, where feasible, restoration, of the overall marine environment, as well as for providing special protection for areas and species of special biological or economic significance.

2) The Navy arbitrarily limited its analysis to only 10 of the 34 marine mammals present in the southern California study area, when the preponderance of the evidence is that 32 of the 34 species are present in the coastal zone.

3) Even the Navy's population level effects analysis was questionable, as it was not supported by substantial evidence. Moreover, it did not include the type of analysis typically supplied in current-day marine mammal population analyses to estimate whether a proposed activity could result in marine mammal stocks falling below their optimal sustainable population levels, which was included in the analysis the Commission relied on in its recent review of the Pacific Gas and Electric Company's high energy seismic survey, and which compared "Level A takes" (under the Marine Mammal Protection Act) against residual "Potential Biological Removal" rates, and "Level B takes" for listed species against minimum population estimates.

4) The Navy provided no explanation as to why significant intensification of use of mid-frequency sonar was needed for military training and testing (e.g., an increase in "MF-1" sonar use (the loudest of the sonars) from 4,454 to 11,534 hours per year).

5) The Navy failed to analyze and consider alternatives such as implementing "time-area" closures, as well as other mitigation measures previously adopted by the Commission in reviewing past Navy consistency determinations for Southern California Training and Testing (CD-086-06 and CD-049-08), measures which the Commission staff requested the Navy to analyze in its July 10, 2012, comments on the HSTT DEIS.

Further support for this last point can be found in the January 9, 2010, letter from former NOAA Administrator Jane Lubchenco (sent to Council on Environmental Quality Chair Nancy Sutley), which, among other things, urges consideration of "time-area closures" and "new approaches" by the Navy (Exhibit 21).

Without the above information, the Commission finds it is unable to determine whether feasible less damaging alternatives are available that would lessen adverse effects on marine resources, and whether the Program would be carried out: (a) in a manner that maintains, enhances, and, where feasible, restores marine resources; and (b) in a manner that provides special protection to areas of special biological or economic significance.

~~Accordingly, in order to bring the activities into consistency with the Coastal Act, the Commission concludes that, in order to find the activities with Section 30230, conditions are needed to: (1) establish larger shutdown areas (up to 2 km) when marine mammals or other species are detected; (2) avoid use of mid-frequency sonar in sensitive areas, which would include Marine Protected Areas and Marine Sanctuaries, seasonal blue and gray whale areas and migration corridors, nearshore areas, and any biologically sensitive area NMFS may designate at a future date; (3) reduce sound under low-visibility conditions; (4) limit typical vessel speeds in sensitive areas to 10 knots (unless higher speeds are necessary for training); (5) improve observer effectiveness training; and (6) implement a contingency plan for use of nearshore explosives, if mortalities recur.~~

Finally, the Commission notes that: (1) the Navy's refusal to consider avoiding state- and federally-designated Marine Protected Areas (MPAs) would undermine significant state and federal efforts establishing the MPAs, by potentially compromising the collection of accurate MPA baseline studies; and (2) during its recent review of Pacific Gas and Electric's consistency certification for the Diablo Canyon Nuclear Power Plant seismic survey (CC-027-12), the Commission determined, as it is determining here, that MPA's are among the habitats afforded "special protection" under the requirements of Section 30230.

~~Finally, to avoid incidents comparable to the March 2011 dolphin mortality, the Commission urges the Navy to improve the safety of the technology and work on developing positive control mechanisms that could be used on timer delay explosives training. The Commission acknowledges that the incident was a rare event and the Navy has improved its mitigation measures for this contingency, but if one more comparable incident occurs, the Commission finds the Navy will need to either provide fail-safe technology, or, at a minimum, commit to aerial monitoring (such as with helicopters) to be included for all such future training using timed explosives. Condition 6 spells out this contingency.~~

~~To conclude, to be consistent with the applicable marine resource protection Coastal Act policies, the Navy would need to modify the activities to implement the conditions contained on pages 6-7 of this report. The Commission concludes that, only as conditioned to include these measures, would the proposed training exercises and other activities be consistent with the applicable marine resource protection policy (Section 30230) of the Coastal Act.~~

~~As provided in 15 CFR § 930.4(b), in the event the Navy does not agree with the Commission's conditions of concurrence, then all parties shall treat this conditional concurrence as an objection.~~

F. COMMERCIAL AND RECREATIONAL FISHING

In addition to the commercial fishing protection afforded under Section 30230 (quoted above on page 1~~7~~4), Sections 30234 and 30234.5 state:

> **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.*

Concerning commercial fishing, the Navy's consistency determination notes that the SOCAL Range Complex supports numerous groundfishes (e.g., flatfishes, skates, sharks, chimeras, rockfishes) that ~~area~~ are important recreational and commercial species, as well as extensive pelagic species including anchovies, mackerel, sardines, and squid. The Navy notes that the harvest of coastal pelagic species is one of the largest fisheries in the SOCAL Range Complex in terms of landed biomass, volume, and revenue, and that in 2010, California ranked fourth in the nation for commercial fisheries landings (measured in pounds). For recreational fisheries, the Navy notes California ranked 14th in the nation in landings of finfish (bony and cartilaginous fish that use fins for locomotion). The Navy states:

> *The Navy has performed military activities within this region in the past, and has not barred fishing or recreational uses. Navy ships, fishermen, and recreational users operate within the area together, and keep a safe distance between each other. Navy exercise participants relocate as necessary to avoid conflicts with nonparticipants. Only specific areas within SOCAL Range Complex have been designated as danger zones or restricted areas. In addition to these areas, the Navy may temporarily establish an exclusion zone for the duration of a specific activity (e.g., an activity involving the detonation of explosives) to prevent non-participating vessels and aircraft from entering an unsafe area. Exclusion zones typically have a radius of only a couple of miles (this varies depending on the activity), are surveyed before, during, and after the activity takes place, and end after the activity is completed. Should the Navy find nonparticipants present in an exclusion zone, the Navy would halt or delay (and reschedule, if necessary) all potentially hazardous activity until the nonparticipants have exited the exclusion zone. Upon completion of training, the range would be reopened and fishermen would be able to return to fish in the previously closed area. To help manage competing demands and maintain public access in the Study Area, the Navy conducts its offshore operations in a manner that minimizes restrictions on commercial fisherman.*

The Navy states that temporary range clearances it implements "… do not adversely affect commercial and recreational fishing activities because displacement is of short duration (hours)," and when they are implemented, the Navy requests U.S. Coast Guard notices to mariners (NOTMARs) to warn the public of upcoming Navy activities. The NOTMARs and postings on Navy websites are intended to prevent fishermen from expending time and fuel resources k Further, in 2009 the Navy conducted a study to assess the effects of Navy activities on commercial and recreational fishing in SOCAL, which include surveying of local fishermen, and identifying several recommendations to improve communications. This study, entitled ("Southern California (SOCAL) Fisheries Study: Catch Statistics (2002-2007), Fishing Access, and Fishermen Perception," February 2009), concludes with five recommendations for improved communications efforts (Exhibit 16). The study indicates the Navy would consider the

recommendations, which it acknowledges "also could benefit the Navy as it would limit potential military/civilian interactions and delays in Navy training activities, as well as improve the perception of the Navy by the fishing community in these shared waters. The recommendations are:

Surveyed Fishermen's Recommendations:

• Regular broadcasted announcements on VHF Channel 16 or the addition of a hotline number that is updated every four hours would reach a greater percentage of the fishing population and allow fishermen to plan their fishing trips in a manner that is more cost and time efficient and less intrusive to Navy training activities.

• More frequent updates to the SCI schedule of operations website would prevent unnecessary and costly trips for fishermen, as well as help the Navy to more easily acquire necessary clearance for the training operations. The addition of a legend for Navy abbreviations/nomenclature and activity types within the schedule of operations webpage would prevent confusion among users and would make it easier for first time users of the website to understand the schedule.

• The addition of a single POC at SCI Fleet Control that has the most updated schedule information for the SCI website would give fishermen who do not utilize the internet a reliable source to contact for regarding the schedule and associated closures.

• The addition of a cellular phone tower at the southern end of SCI would allow fishermen who do not have satellite phones to call SCI Security if they had questions regarding the schedule once they have left the mainland. This also would improve overall communication between the fishermen and SCI Security in the southern end of SCI.

• Not all Navy training activities occur in the waters surrounding SCI. Clarification of whether a Navy activity requires a closure to fishing grounds or if fishing is still permitted despite the operations would allow fishermen to fish in areas that they may perceive as closed when, in fact, they are open for use.

The last page of the study indicates at least partial implementation, as follows:

During the course of the study, some of the recommendations have already been addressed by SCORE [Southern California Offshore Range].In particular, the initiation of development of a more robust SCORE range control, which will allow fishermen to contact the SCI Range in realtime using marine band radio (VHF) or cellular phones to obtain the status of OPAREA availability. In addition, a list of OPAREA and altitude acronyms/codes was generated and posted as a link on the main page of the SCI website (http://www.scisland.org/temp/acronyms.php) which, along with other user-friendly website implementations (i.e., "Tool Tips"), is in the process of being added to the SCI website. Once developed, when a user clicks on an OPAREA within Tool Tips, information with respect to a particular area and color coordination between the area on

> *the map and the record listed will be displayed. The Navy will continue to review the remainder of the fishermen's recommendations and determine which are feasible to implement without compromising the critical training activities at the SCI Range Complex.*

Concerning the proposed SOCAL Training and Testing, the Navy's conclusion concerning effects on commercial and recreational fishing is as follows:

> *The Navy has been conducting training and testing activities within the coastal zone for decades, and has taken and will continue to take measures to prevent interruption of commercial and recreational fishing activities. Fishing activities would not be permanently inhibited by Navy activities. The Navy would require exclusive use of portions of nearshore waters for short durations (hours), but training and testing areas would be small. The Navy has conducted training and testing activities in the past, with little to no adverse effects on commercial or recreational fishing. Thus, the Proposed Action would be consistent to the maximum extent practicable with Section 30234.5 of the California Coastal Act.*

The Commission believes it is incumbent on the Navy to follow through on the above commitments to consider improved communications with the fishing community. In addition to the information deficiencies identified in the previous section of this report, the Commission finds that the Navy's consistency determination lacks sufficient information to enable the Commission to determine consistency with the commercial fishing policies (Sections 30230, 30234, and 30234.5) of the Coastal Act, because the Navy has not explained why it is unwilling to consider implementing its own 2009 commercial fishing survey recommendations to improve communications with the commercial fishing industry.

~~In order to find the proposed activities consistent with the commercial and recreational fishing policies, the Commission therefore finds a condition is needed to hold the Navy to these commitments to reduce, where feasible, use conflicts with the fishing industry. The condition (page 7) would require the Navy to implement each of the above recommendations or provide an explanation to the Commission within a reasonable period of time as to why the Navy considers implementation infeasible. The Commission concludes that, only as conditioned to include these measures, would the proposed training exercises and other activities be consistent with the commercial and recreational fishing policies (Sections 30230, 30234 and 30234.5) of the Coastal Act.~~

~~As provided in 15 CFR § 930.4(b), in the event the Navy does not agree with the Commission's conditions of concurrence, then all parties shall treat this conditional concurrence as an objection.~~

G. PUBLIC ACCESS AND RECREATION

Section 30210 of the Coastal Act states:

> *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 states 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....*

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 its previous review of Navy SOCAL testing and training, the Commission found the activities consistent with the public access and recreation, and commercial and recreational fishing policies of the Coastal Act. The Navy's consistency determination states that while the proposed training and testing activities could temporarily limit access to ocean areas for a variety of human activities associated with commercial transportation and shipping, commercial recreation and fishing, subsistence use, and tourism. Nevertheless the Commission agrees with the Navy that under the Coastal Act's public access policies, exceptions are made for public safety and military security needs. The Navy further states under the proposal, no new restricted areas would be implemented, and also that when range clearance is required, as it has done historically, the public is notified through U.S. Coast Guard Notices to Mariners (NOTMARs). The Navy states:

> *This notice allows the public to select an alternate destination without an appreciable effect on their activities. In addition, the Navy maintains a website that notifies the public about closures in the areas surrounding San Clemente Island (http://www.scisland.org/).*

The Navy also states:

> *Restricted areas are typically avoided by experienced mariners. Prior to initiating a training or testing activity, the Navy would follow standard operating procedures to visually scan an area to ensure that nonparticipants are not present. If nonparticipants are present, the Navy would delay, move, or cancel its activity.*

The Navy concludes:

> *No impacts on public use or tourism within the coastal zone are anticipated because inaccessibility to areas of co-use would be temporary and of short duration (hours). Based on the Navy's standard operating procedures and the large expanse of the Study Area that would be available to the public, accessibility impacts would remain negligible. Thus, the Proposed Action would be consistent to the maximum extent practicable with Section 30210 of the California Coastal Act.*

The Commission concurs with the Navy's analysis and finds the proposed activities consistent with the public access and recreation policies of the Coastal Act.

APPENDIX A: SUBSTANTIVE FILE DOCUMENTS

1. Navy Consistency Determination CD-008-13.

2. Previous Navy Consistency Determinations CD-33-10 (Navy SSTC), CD-049-08, Navy SOCAL), CD-086-08 (Navy Onshore and offshore U.S. Pacific Fleet military 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).

3. Hawaii-Southern California Training and Testing Draft Environmental Impact Statement/Draft Overseas Environmental Impact Statement, U.S. Department of the Navy (May 2012).

4. Takes of Marine Mammals Incidental to Specified Activities - Proposed Rule published by the National Marine Fisheries Service, Federal Register Notice ((January 31, 2013).

5. Request for Letters of Authorization for the Incidental Harassment of Marine Mammals resulting from U.S. Navy Training And Testing Activities in the Hawaii-Southern California Training and Testing Study Area, Commander, United States Pacific Fleet, September 4, 2012.

6. Pacific Gas and Electric Consistency Certification CC-027-12, Seismic Survey offshore Diablo Canyon Nuclear Power Plant.

7. Moore J.E. and Barlow, J.P., Declining Abundance in beaked whales (Family *Ziphiidae*) in the California Current Large Marine Ecosystem. *PLoS ONE* 8(1):e52770 (2013).

8. Melcon, M.L., Cummins, A.J., Kerosky, S.M., Roche, L.K., Wiggins, S.M., Blue whales respond to anthropogenic noise, *PLoS ONE* 7(2): e32681 (2012).

9. Southall, B., Calambokidis, J., Tyack, P., Moretti, D., Hildebrand, J., Kyburg, C., Carlson, R., Friedlaender, A., Falcone, E., Schorr, G., Douglas, A., DeRuiter, S., Goldbogen, J., and Barlow, J., Biological and behavioral response studies of marine mammals in Southern California, 2010 (“SOCAL-10”) (2011).

10. Tyack, P.L., Zimmer, W.M.X., Moretti, D., Southall, B.L., Claridge, D.E., Durban, J.W., Clark, C.W., D’Amico, A., DiMarzio, N., Jarvis, S., McCarthy, E., Morrissey, R., Ward, J., and Boyd, I.L., Beaked whales respond to simulated and actual Navy sonar, *PLoS ONE* 6(3):e17009.doi:10.13371/journal.pone.0017009 (2011).

11. Brandon L. Southall, Ann E. Bowles, William T. Ellison, James J. Finneran, Roger L. Gentry, Charles R. Greene Jr., David Kastak, Darlene R. Ketten, James H. Miller, Paul E. Nachtigall, W. John Richardson, Jeanette A. Thomas, & Peter L. Tyack, Marine Mammal Noise Exposure Criteria: Initial Scientific Recommendations, Aquatic Mammals, Volume 33, Number 4, 2007.

12. Southern California (SOCAL) Fisheries Study: Catch Statistics (2002-2007), Fishing Access, and Fishermen Perception, Naval Undersea Warfare Center Division, February 2009.

APPENDIX B: Total Navy Take Requests, Both Hawaii and California Programs Combined

Table 5-1: Summary of Annual and 5-Year Take Request for Training Activities

MMPA Category	Source	Training Activities	
		Annual Authorization Sought	5-Year Authorization Sought
Mortality	Impulse	7 mortalities applicable to any small odontocete or pinniped species	35 mortalities applicable to any small odontocete or pinniped species over five years
	Unspecified[1]	2 mortalities to beaked whales[1]	10 mortalities to beaked whales over five years[1]
	Vessel strike	No more than 4 large whale mortalities in any given year[2]	No more than 12 large whale mortalities over five years over five years[2]
Level A	Impulse and Non-Impulse	266 - Species specific data shown in Table 5-2	1,314 - Species specific data shown in Table 5-2
Level B	Impulse and Non-Impulse	1,691,123 - Species specific data shown in Table 5-2	8,398,931 - Species specific data shown in Table 5-2

[1] For Training: The Navy's NAEMO model idid not quantitatively predict these mortalities. Navy, however, is seeking this particular authorization given sensitivities these species may have to anthropogenic activities. Request includes 2 Ziphidae beaked whale annually to include any combination of Cuvier's beaked whale, Baird's beaked whale, Longman's beaked whale, and unspecified Mesoplodon sp. (not to exceed 10 beaked whales total over the 5-year length of requested authorization).

[2] For Training: Navy cannot quantifiably predict that proposed takes from training will be of any particular species, and therefore seeks take authorization for any combination of large whale species (gray whale, fin whale, blue whale, humpback whale, Bryde's whale, sei whale, minke whale, or sperm whale), but of the 4 takes per year no more than 2 of any one species of blue whale, fin whale, humpback whale, sei whale, or sperm whale is requested.

Table 5-3: Summary Of Annual and 5-Year Take Request for Testing Activities

MMPA Category	Source	Testing Activities	
		Annual Authorization Sought	5-Year Authorization Sought
Mortality	Impulse	19 mortalities applicable to any small odontocete or pinniped species	95 mortalities applicable to any small odontocete or pinniped species over five years
	Vessel strike	No more than 2 large whale mortalities in any given year[1]	No more than 3 large whale mortalities over five years over five years[1]
Level A	Impulse and Non-Impulse	145 - Species specific data shown in Table 5-4	725 - Species specific data shown in Table 5-4
Level B	Impulse and Non-Impulse	238,880 - Species specific data shown in Table 5-4	1,194,400 - Species specific data shown in Table 5-4

[1] Navy cannot quantifiably predict that the proposed takes from testing (a total of 2 in a given year or over the course of 5-years) will be of any particular species, and therefore seeks take authorization for any combination of large whale species (gray whale, fin whale, blue whale, humpback whale, Bryde's whale, sei whale, minke whale, or sperm whale), but of the 2 takes in any given year, no more than 1 of each species of blue whale, fin whale, humpback whale, sei whale, or sperm whale is requested.

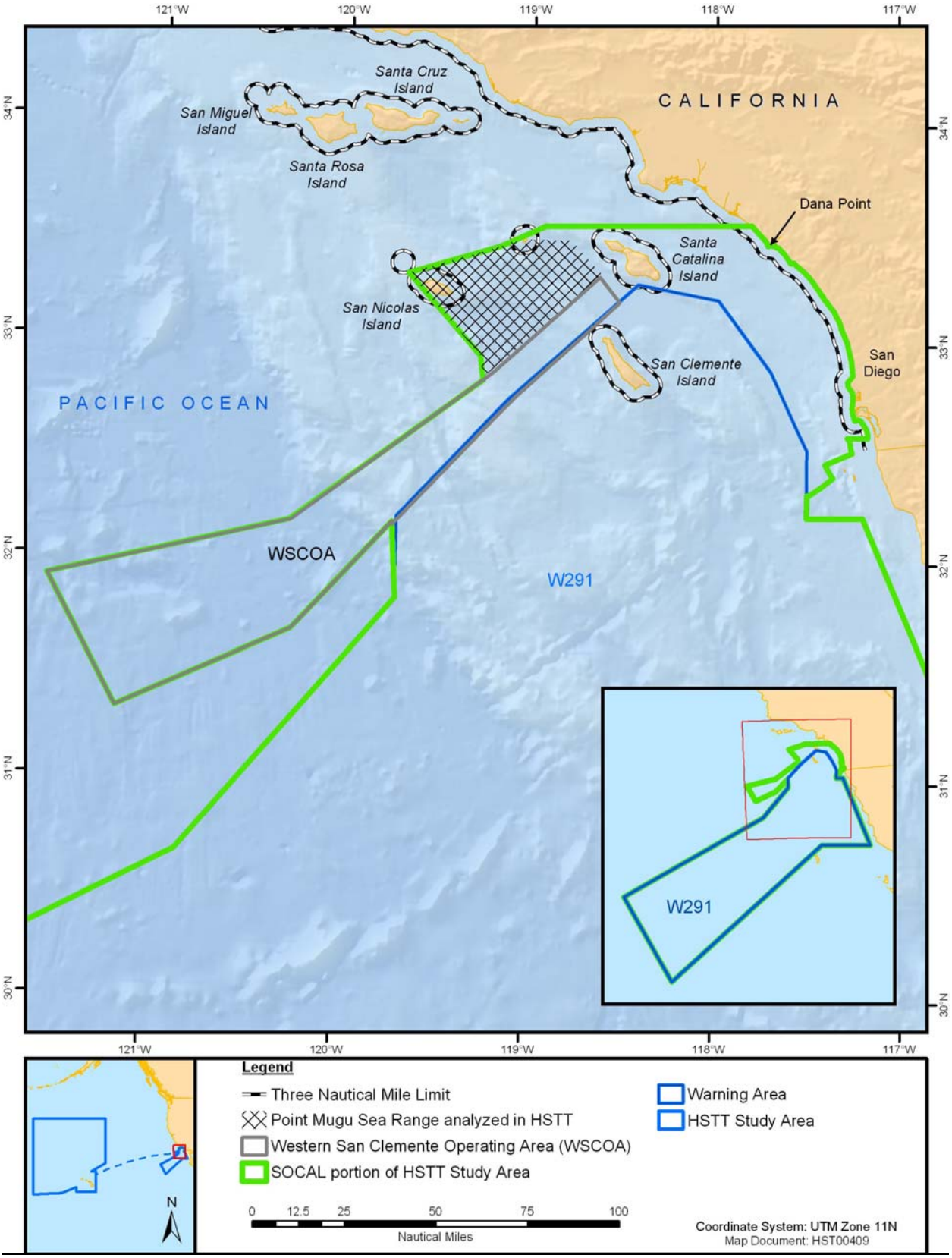


Figure 2-1: Southern California Range Complex

Exhibit 1
CD-008-13

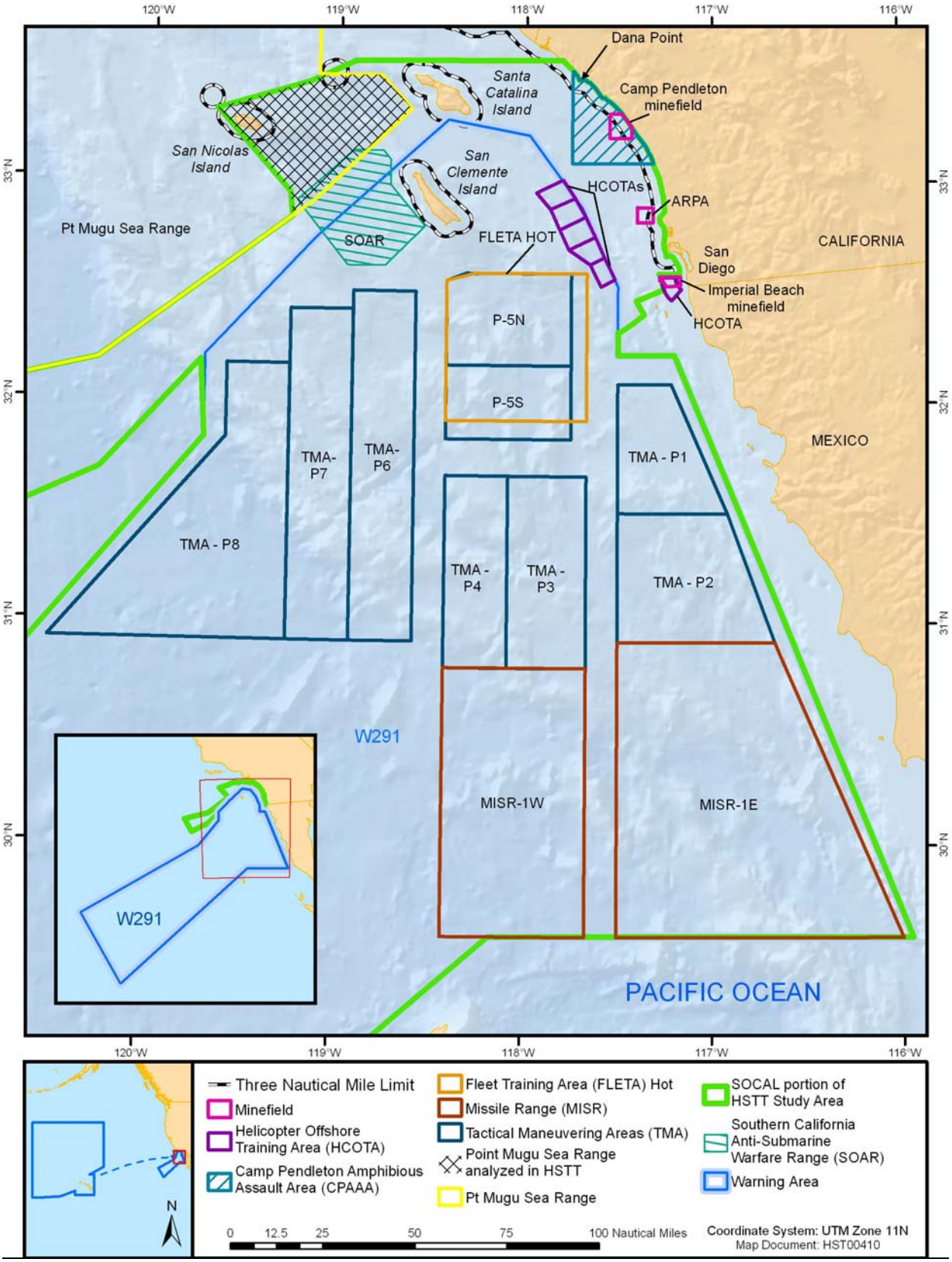


Figure 2-4 Southern California Training Areas

Exhibit 2
CD-008-13

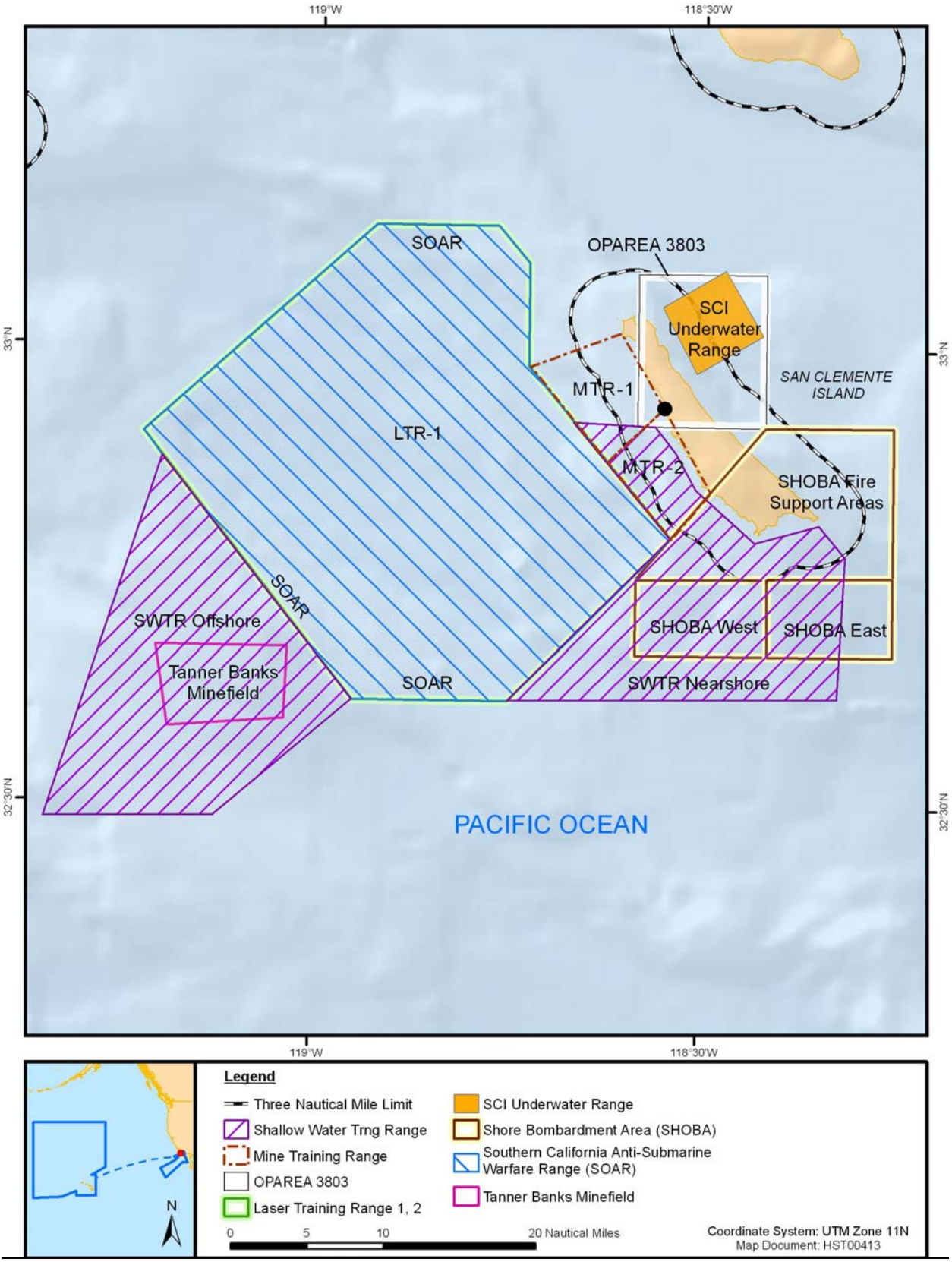


Figure 2-2: San Clemente Island Offshore Training Areas

Exhibit 3
CD-008-13

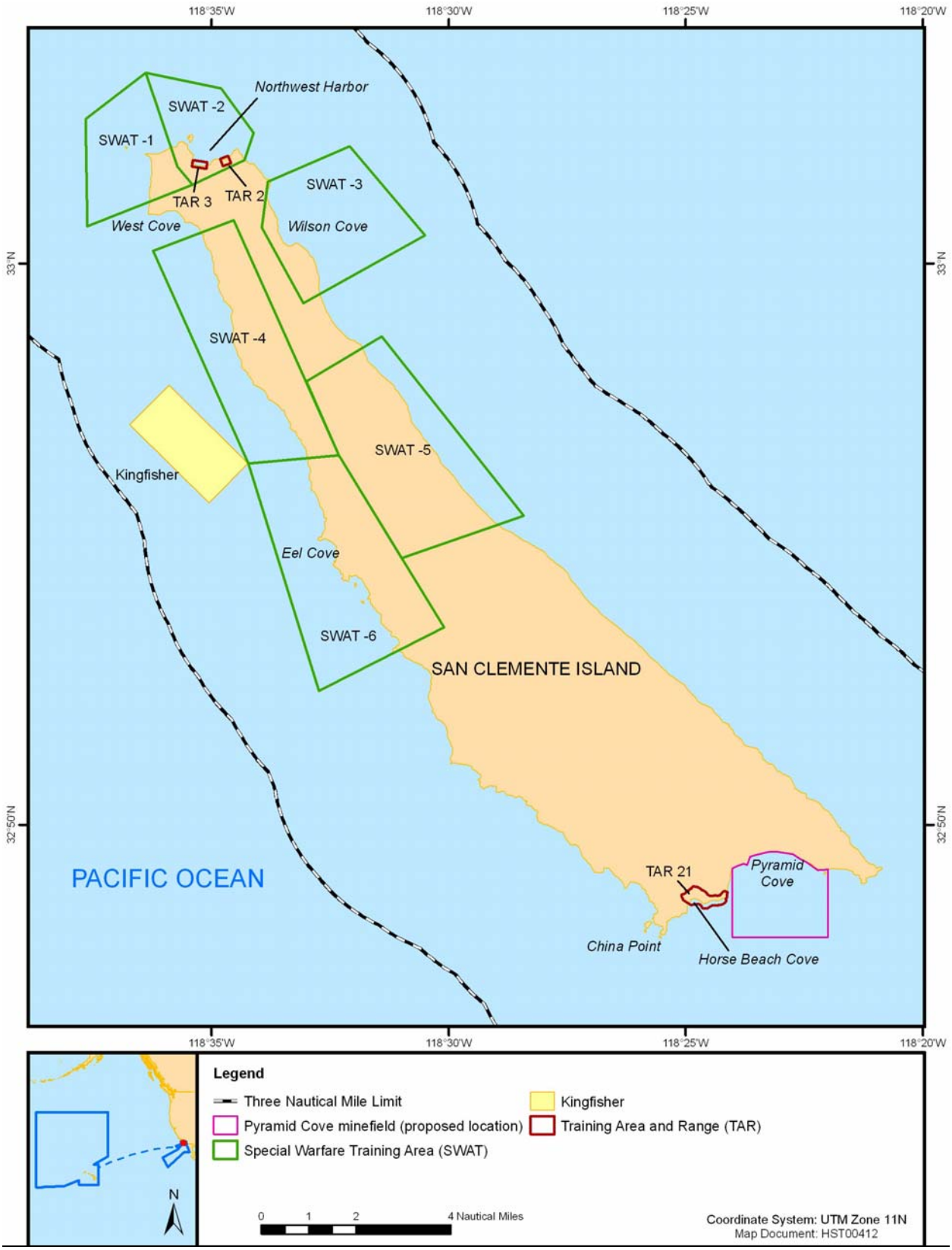


Figure 2-3: San Clemente Island Nearshore Training Areas

Exhibit 4
CD-008-13

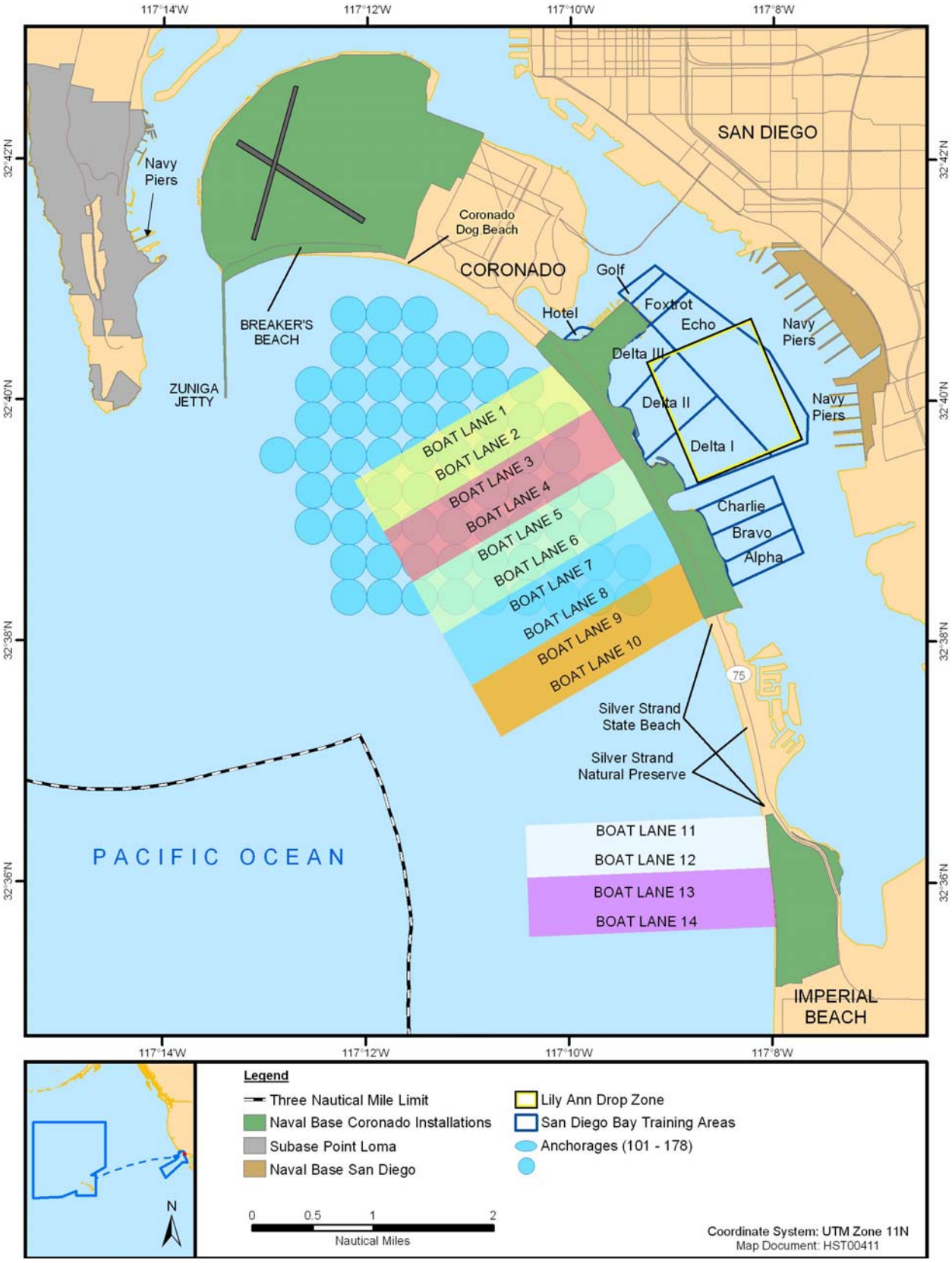


Figure 2-5: Silver Strand Training Complex

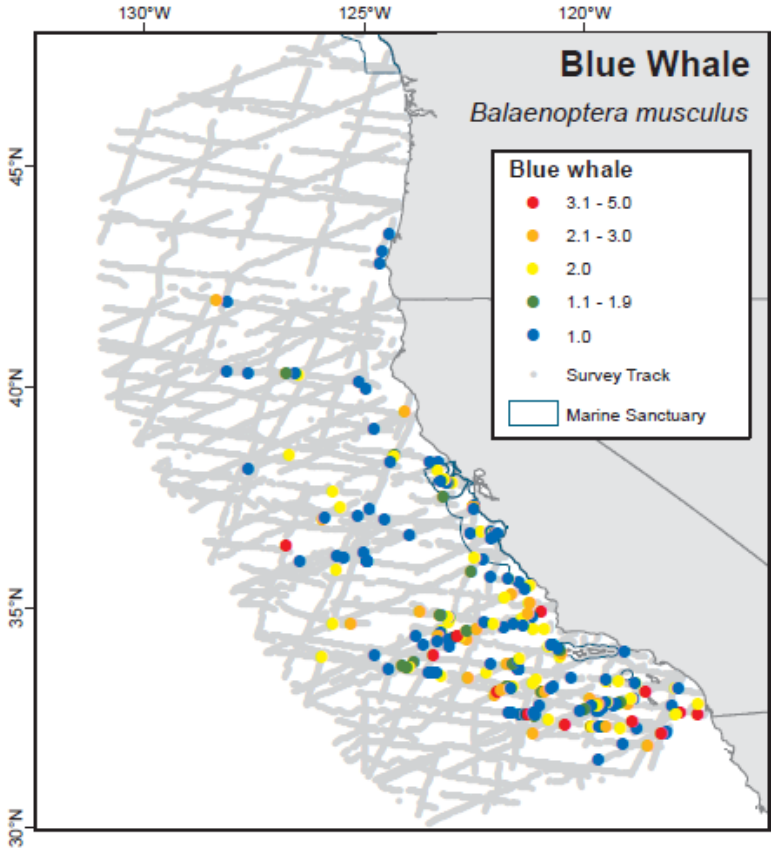
Exhibit 5
CD-008-13

Marine Mammal Species in California Coastal Waters – Select References and Discussions[1]

Blue Whale

From NOAA 2005:

> *Although stock structure of blue whales in the North Pacific has been hypothesized to include one (Donovan, 1991) to five (Reeves et al., 1998) sub-stocks, the most recent U.S. stock assessments for this species (Carretta et al., 2002) includes an Eastern North Pacific stock in addition to the Hawaiian stock. The Eastern North Pacific stock, which feeds in California waters during the summer and fall and migrates to waters off Mexico and Central America during the winter (Calambokidis et al., 1990), is believed to be separate from the Gulf of Alaska population (Rice, 1992). The most recent abundance estimate for this stock, based on a weighted average of the estimates from the 1991-1996 SWFSC ship surveys (Barlow, 1997) and a 1993 mark-recapture survey (Calambokidis and Steiger, 1994) was 1,940 individuals (Carretta et al., 2002).*



[1] The studies, reports, and research included in this document are but a limited sample of available documentation of the presence, distribution and abundance of these species in California coastal waters and have been included to demonstrate an example of available information, not a comprehensive summary.

Exhibit 6
CD-008-13

Whale watch sighting log from Hornblower Cruises San Diego:
http://fromthepilothouse.typepad.com/san_diego_whale_watching/captains-log.html

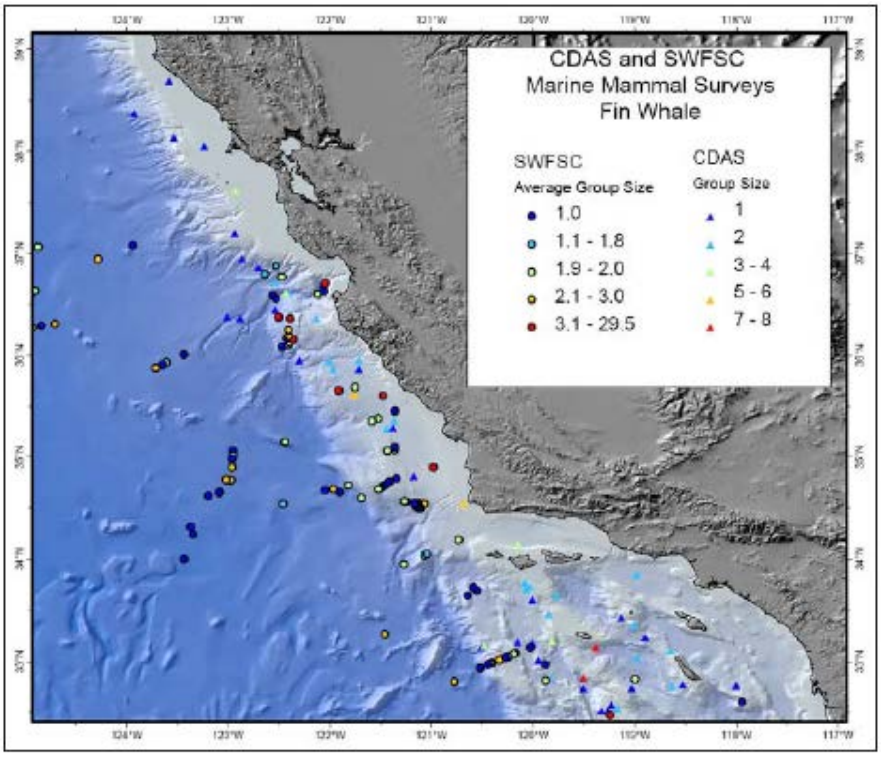
Whale watch sighting log from Newport Landing Whale Watching:
http://www.newportwhales.com/whalecount.html

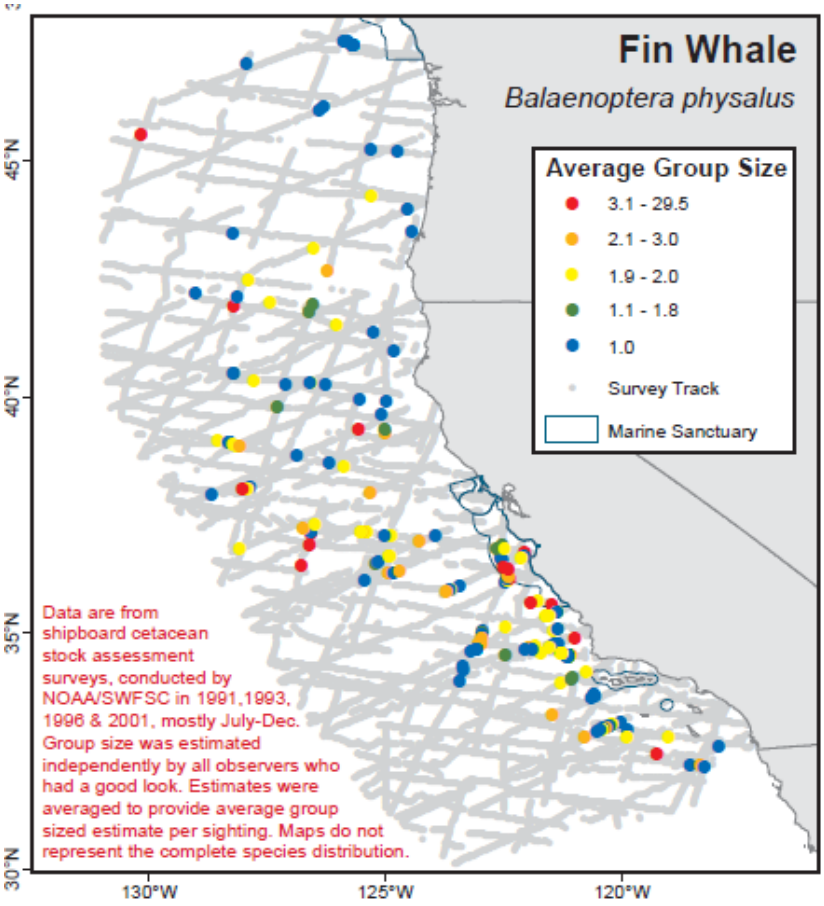
From Navy Monitoring Report 2011:
p. 386 - note about 3-6 blue whales seen on five of seven survey days in same location approx. 2nm off of La Jolla near a large buoy; second note that "92% of all blue whale groups were seen within 15km (8nm) of the mainland coast, despite considerable effort further offshore, indicating that blue whales prefer coastal SOCAL waters."; (includes references to Smultea et al 2009 and 2010 publications).
p. 395 - map of survey efforts and BW observations
p. 801-825- observed during small boat nearshore surveys

Fin Whale

From NOAA 2005:

> *Although three fin whale stocks are recognized in U.S. North Pacific waters, little is known about the population structure of this species. Year round aggregations of fin whales have been recorded in central and southern California with lower abundance in California waters during the winter and spring (Dohl et al., 1983; Forney et al., 1995). The California/Oregon/Washington stock size was estimated in the most recent stock assessment report (Carretta et al., 2002) at 1,851 individuals based on the 1993 and1996 SWFSC ship surveys (Barlow and Taylor, 2001); however, this is thought to be a slight underestimate because not all fin whales could be identified to species in the field. Fin whale is a federally listed endangered species.*
>
> *Fin whales have been sighted in shelf, slope, and offshore waters throughout central and southern California during the SWFSC ship surveys and the CDAS surveys (Figure 6.1.18).*


CDAS and SWFSC
Marine Mammal Surveys
Fin Whale
SWFSC
Average Group Size
1.0
1.1 - 1.8
1.9 - 2.0
2.1 - 3.0
3.1 - 29.5
CDAS
Group Size
1
2
3 - 4
5 - 6
7 - 8


Fin Whale
Balaenoptera physalus
Average Group Size
3.1 - 29.5
2.1 - 3.0
1.9 - 2.0
1.1 - 1.8
1.0
Survey Track
Marine Sanctuary
Data are from shipboard cetacean stock assessment surveys, conducted by NOAA/SWFSC in 1991,1993, 1996 & 2001, mostly July-Dec. Group size was estimated independently by all observers who had a good look. Estimates were averaged to provide average group sized estimate per sighting. Maps do not represent the complete species distribution.
45°N
40°N
35°N
30°N
130°W
125°W
120°W

Whale watch sighting log from Hornblower Cruises San Diego:
http://fromthepilothouse.typepad.com/san_diego_whale_watching/captains-log.html

Whale watch sighting log from Newport Landing Whale Watching:
http://www.newportwhales.com/whalecount.html

From Navy Monitoring Report 2011:
p. 371: Tracks from five tagged fin whales off of SD
p. 386: note that all four fin whale sightings were within 10km (5nm) of the mainland near San Diego (includes references to Smultea et al 2009 and 2010 publications).
p. 395: map of survey efforts and FW observations
p. 801-825: observed during small boat nearshore surveys

From Hamilton et al. 2009[2]:

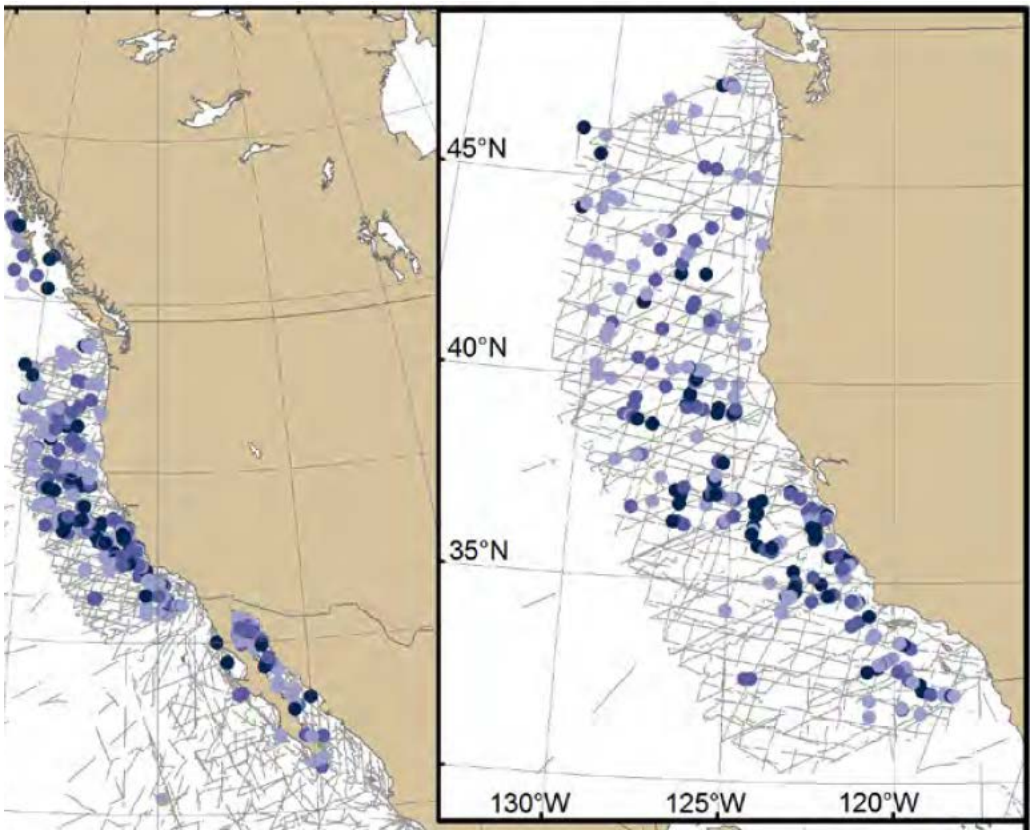


Figure 8. Distribution of fin whale, Baleanoptera physalus, species code 074.

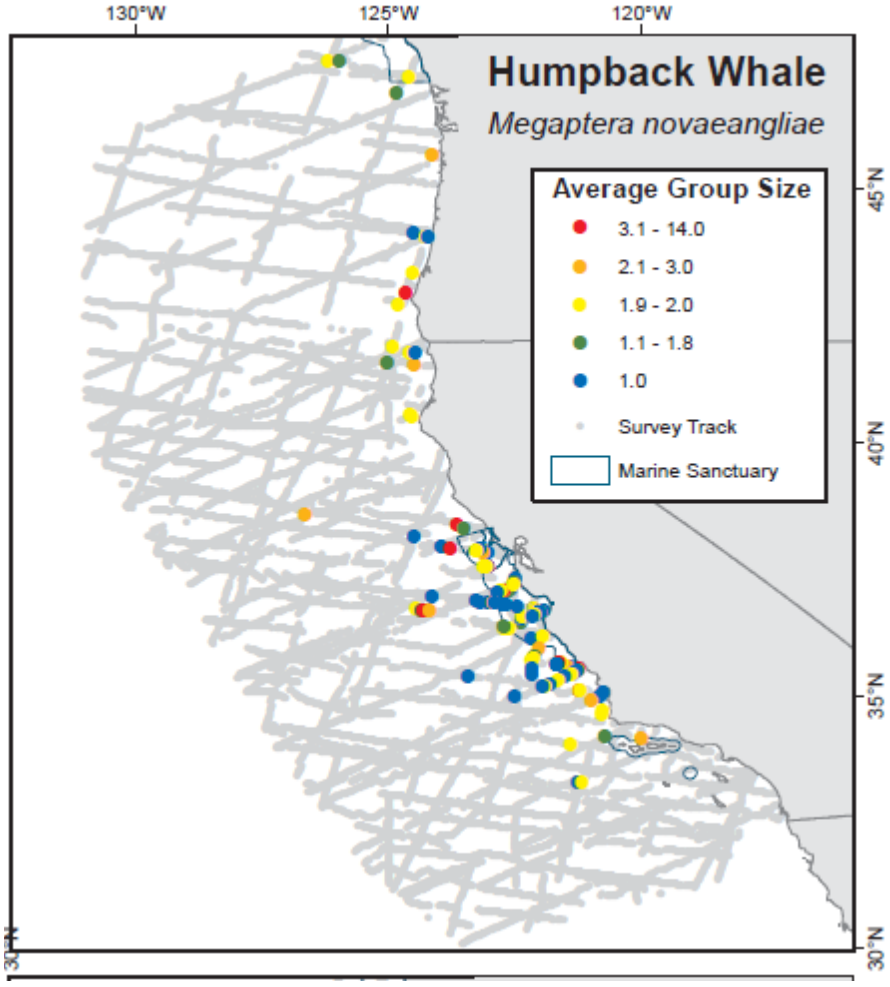
Humpback Whale

From NOAA 2005:

[2] Several figures from this reference will be included below, in each the gray lines represent survey tracks and the dark circles represent whale sightings – the darker circles represent multiple animals.

Sightings of humpback whales from the SWFSC ship surveys and the CDAS surveys (Figure 6.1.13) occur most frequently in shelf waters to the north of Point Conception. Scattered sightings also occur in the Southern California Bight (including several in the Santa Barbara Channel) and in offshore waters. Because of the uneven distribution of survey effort, the pattern of sightings should be used only as confirmation that humpback whales do exist in a given area; the absence of sightings may reflect insufficient survey effort rather than real absence from the area.

From NOAA 2007:



Whale watch sighting log from Hornblower Cruises San Diego:
http://fromthepilothouse.typepad.com/san_diego_whale_watching/captains-log.html

Whale watch sighting log from Newport Landing Whale Watching:
http://www.newportwhales.com/whalecount.html

From Navy Monitoring Report 2011:
p. 801-825: observed during small boat nearshore surveys

From Hamilton 2009:

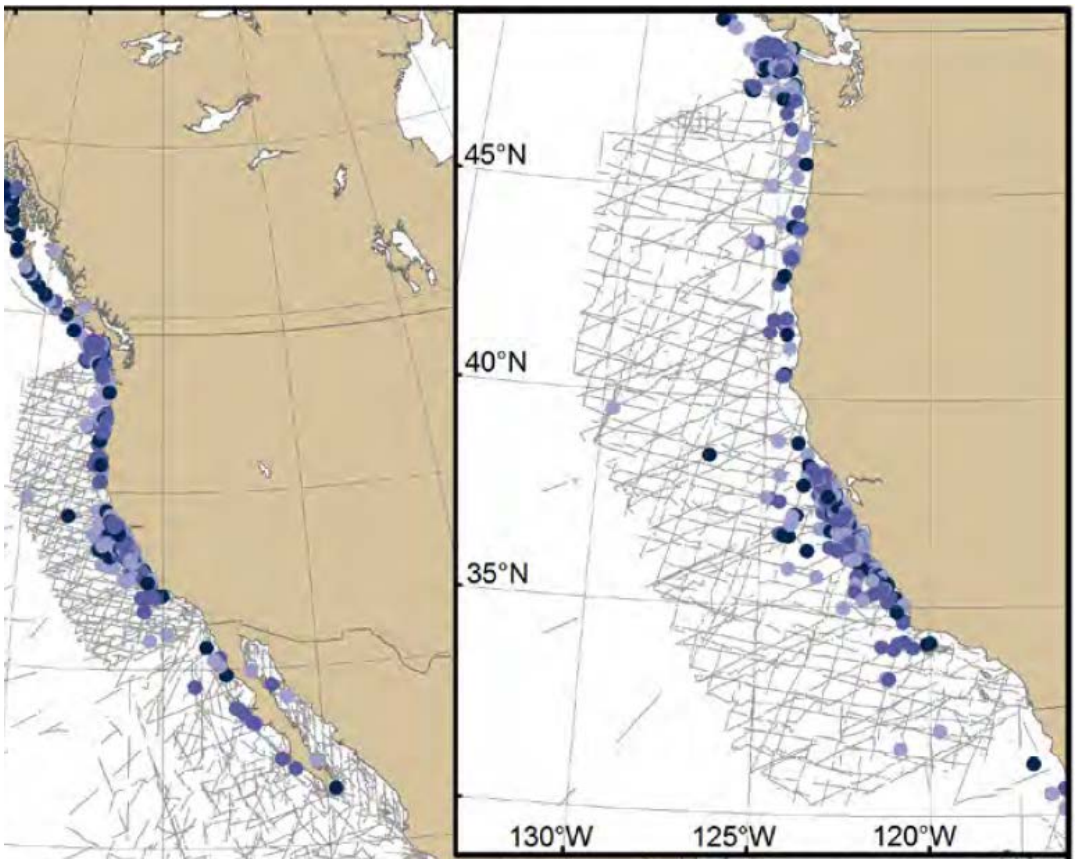
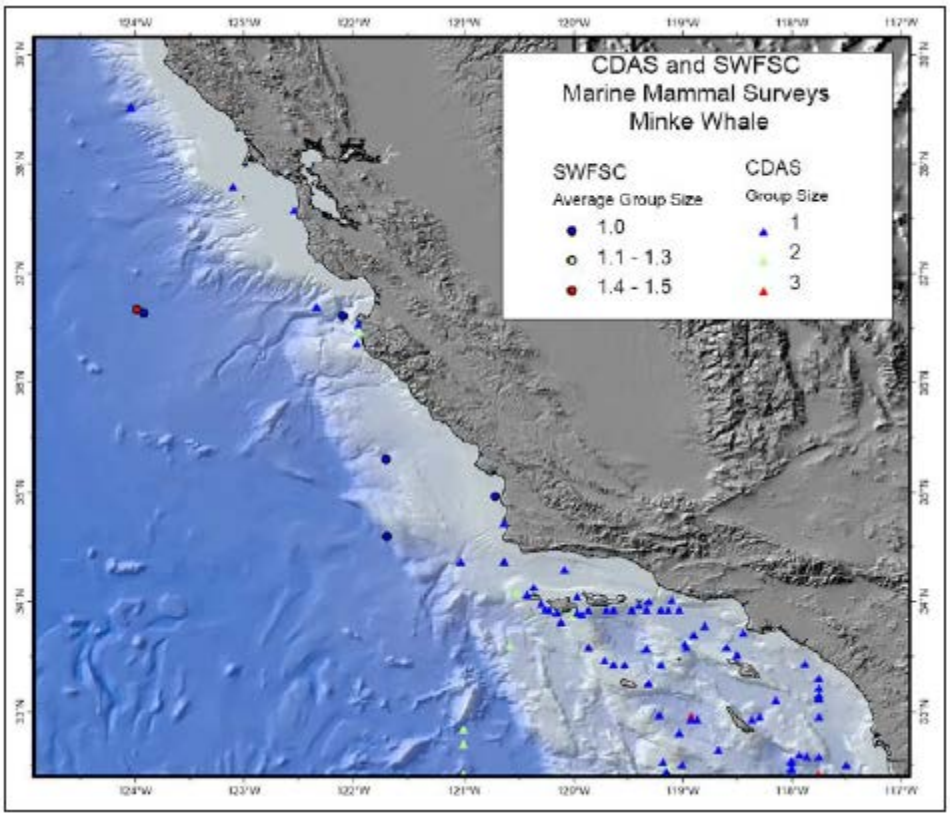


Figure 25. Distribution of Humpback whale, Megaptera novaaenglidae.

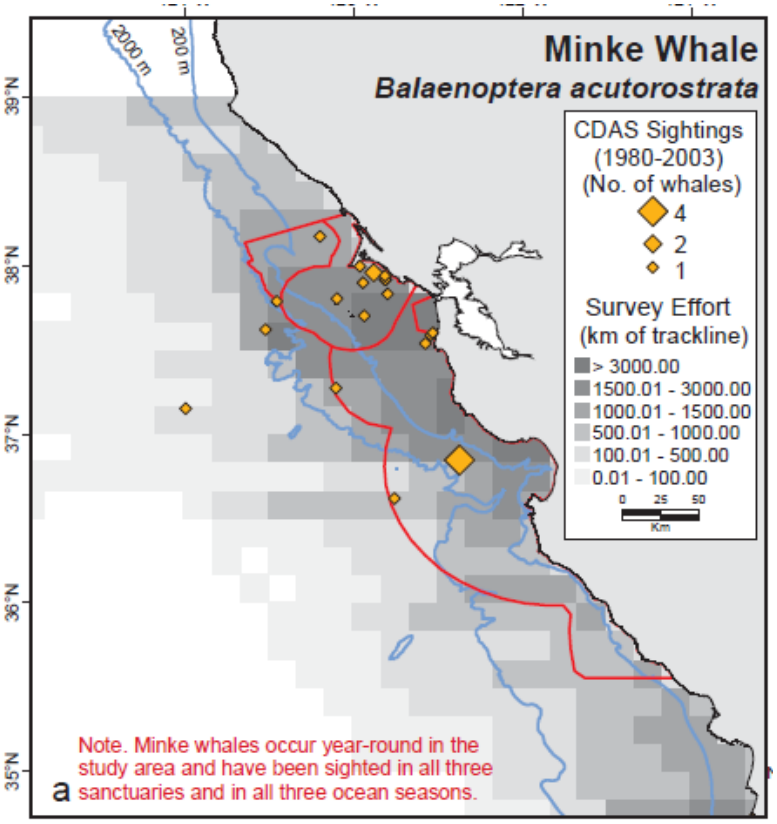
Minke Whale

From NOAA 2005:

> *Two minke whale stocks are recognized in U.S. North Pacific waters, an Alaskan stock that is believed to be migratory, and a California/Oregon/Washington stock. In California, minke whales are present year-round (Dohl et al., 1983; Forney et al., 1995; Barlow, 1997) and some individuals are thought to establish home ranges (Dorsey et al., 1990). The California/Oregon/ Washington stock size was estimated in the most recent stock assessment report (Carretta et al., 2002) at 631 individuals based on the 1991-1996 SWFSC ship surveys (Barlow 1997). Minke whale is not federally listed as threatened or endangered.*
>
> *Although scattered sightings of minke whales have been recorded in shelf, slope, and offshore waters off central California during the SWFSC ship surveys and the CDAS surveys (Figure 6.1.20), the bulk of sightings from the CDAS surveys occurred in the Southern California Bight, with a cluster of sightings around the northern Channel Islands.*



From NOAA 2007:



Whale watch sighting log from Hornblower Cruises San Diego:
http://fromthepilothouse.typepad.com/san_diego_whale_watching/captains-log.html

Whale watch sighting log from Newport Landing Whale Watching:
http://www.newportwhales.com/whalecount.html

From Navy Monitoring Report 2011:
p. 801-825 - observed during small boat nearshore surveys

From Hamilton et al. 2009:

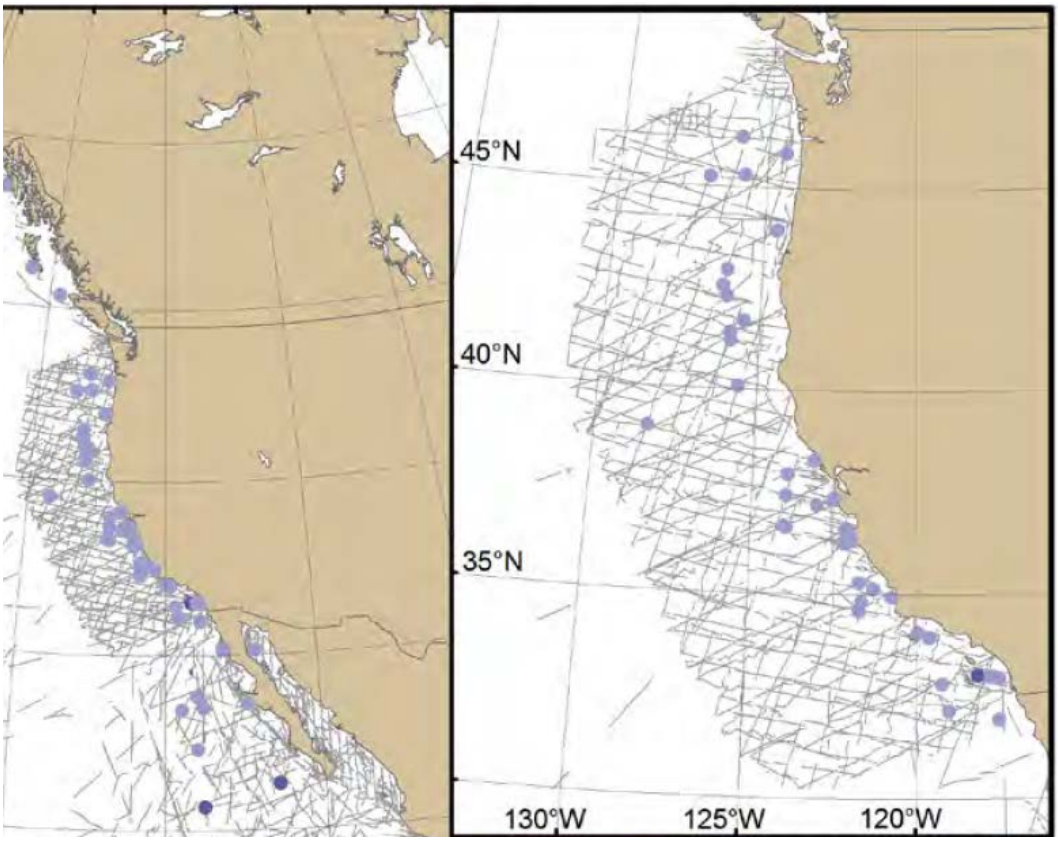


Figure 3. Distribution of common minke whale, Baleanoptera acutorosrata, species code 071.

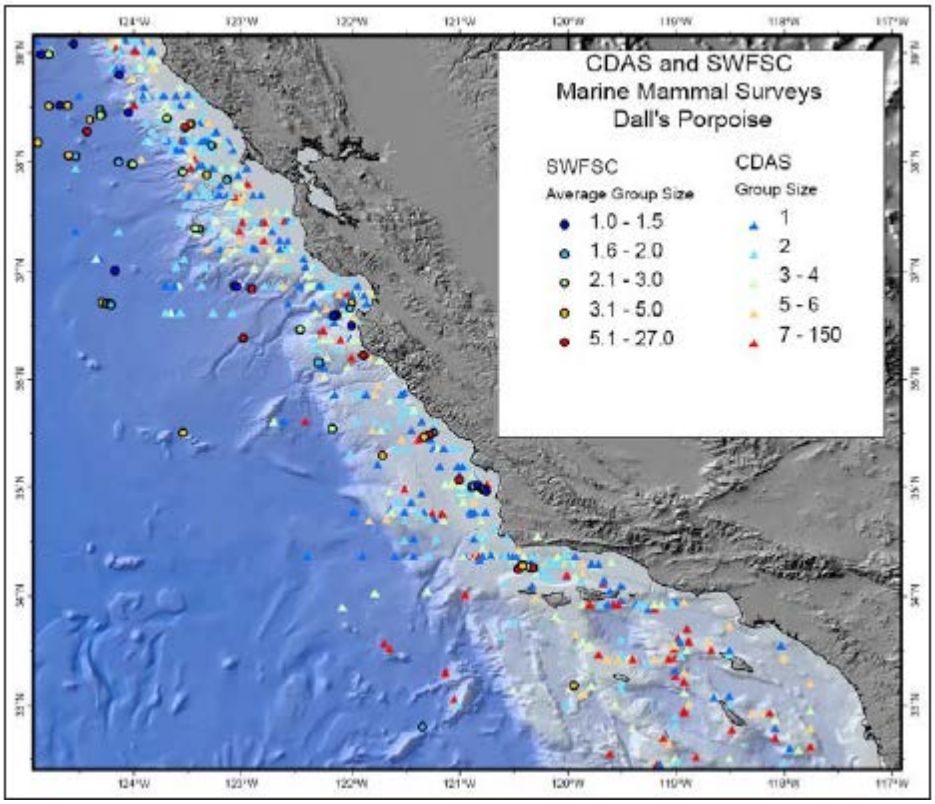
Dall's Porpoise

From NOAA 2005:

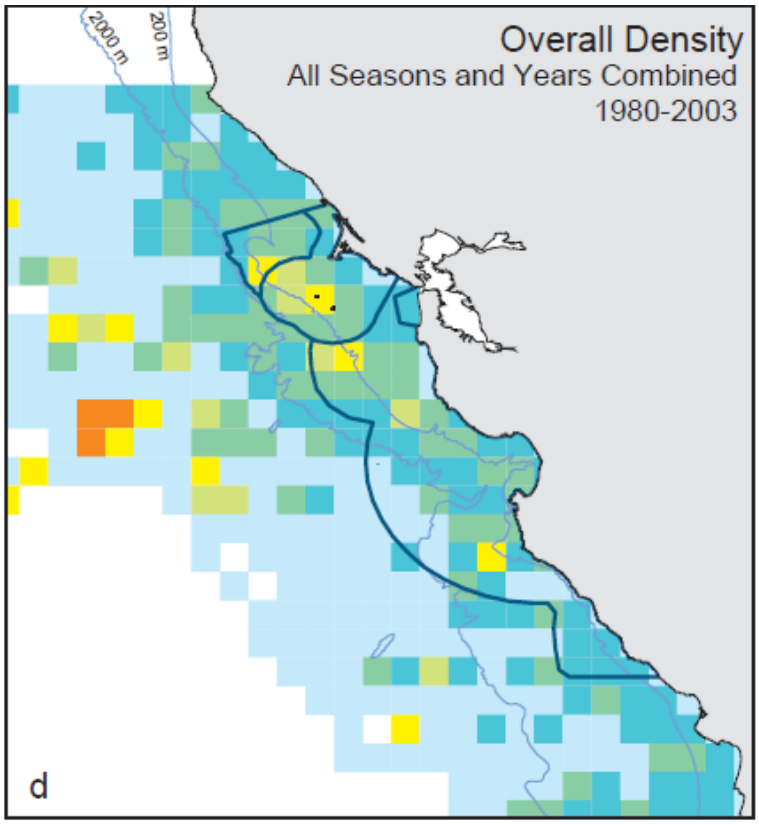
> *Dall's porpoise are found throughout the temperate shelf, slope, and offshore waters of the U.S. West Coast where they exhibit seasonal and interannual movements that appear to be related to changes in oceanographic conditions (Forney et al., 1995). They are most abundant off southern California in the winter. The California/Oregon/Washington stock size was estimated in the most*

recent stock assessment report (Carretta et al., 2002) at 116,016 individuals based on the 1991-1996 SWFSC ship surveys (Barlow 1997), with an estimated 1,500 additional individuals in Washington inland waters (Calambokidis et al., 1997). Dall's porpoise is not a federally listed endangered or threatened species.

Dall's porpoise were commonly sighted in shelf waters throughout central and southern California during the SWFSC ship surveys and the CDAS surveys (Figure 6.1.17). Many sightings were recorded in the Santa Barbara Channel, off Point Conception, and just south of Santa Cruz and Anacapa Islands.



From NOAA 2007:



From Navy Monitoring Report 2011:
p. 497 – observed on 4/13/2011
p. 512 – observed on 2/17/11; 17 miles NW of SCI
p. 801-825 - observed during small boat nearshore surveys

Killer Whale

From NOAA 2005:

> *Relatively little is known about the killer whales found in California waters compared to the well-studied populations of Alaska and the Pacific Northwest. Nevertheless, four separate types of killer whales have been identified and regularly sighted in California. These groups differ in their behavior, genetics, distribution, coloration and preferred prey (Ford and Fisher, 1982; Baird and Stacey, 1988; Baird et al., 1992; Hoelzel et al. 1998). Three of the four types found in California waters (the so-called 'resident', 'transient', and 'offshore' types) were first identified and characterized in the eastern North Pacific. The fourth (the "LA pod") has only been recorded off southern and central California and off Baja California, Mexico.*
> …
> *Transient-type whales are unpredictable in their seasonal movements and travel throughout an extensive range with some individuals recorded in both central California and Southeast Alaska (Goley and Straley, 1994). Transients are the*

most frequently spotted type of killer whale off of central California (Black et al., 1997). They specialize on hunting marine mammals including seals and sea lions as well as large whales (such as gray whales) and their calves during seasonal whale migrations. The most recent estimate of the size of the Eastern North Pacific Transient stock of killer whales is a minimum of 346 individuals (Angliss and Lodge, 2002), of which 105 individuals have been identified in California (Black et al., 1997).

Offshore-type killer whales, first identified as a separate group off western Vancouver Island, Canada in the 1980's, are less well studied than residents and transients. The first offshore-type individuals in California were identified from photos taken in 1993 off of Point Conception, however, they may have been present in this area since the mid-1980s (Black et al., 1997). More recently, this type has been documented off Los Angeles and in Monterey Bay (Black et al., 1997). The offshore-type travels in larger groups, is more vocal than transient-types, and has not been observed feeding on marine mammals. The most recent estimate of the size of the offshore-type killer whale population in Washington, Oregon, and California based on the 1991-1996 SWFSC ship surveys is 285 individuals (Carretta et al., 2002). This is considered a conservative estimate.

The "LA Pod," named for the location where they were commonly observed during the 1980s, appears to be a distinct type that occurs primarily off Baja California, Mexico, but occasionally found off southern or central California. Members of this group were first photographed in 1982 and have been spotted from about San Francisco south to the Sea of Cortez, Mexico. They have never been observed feeding on marine mammals (Black et al., 1997).

From Hamilton et al. 2009:

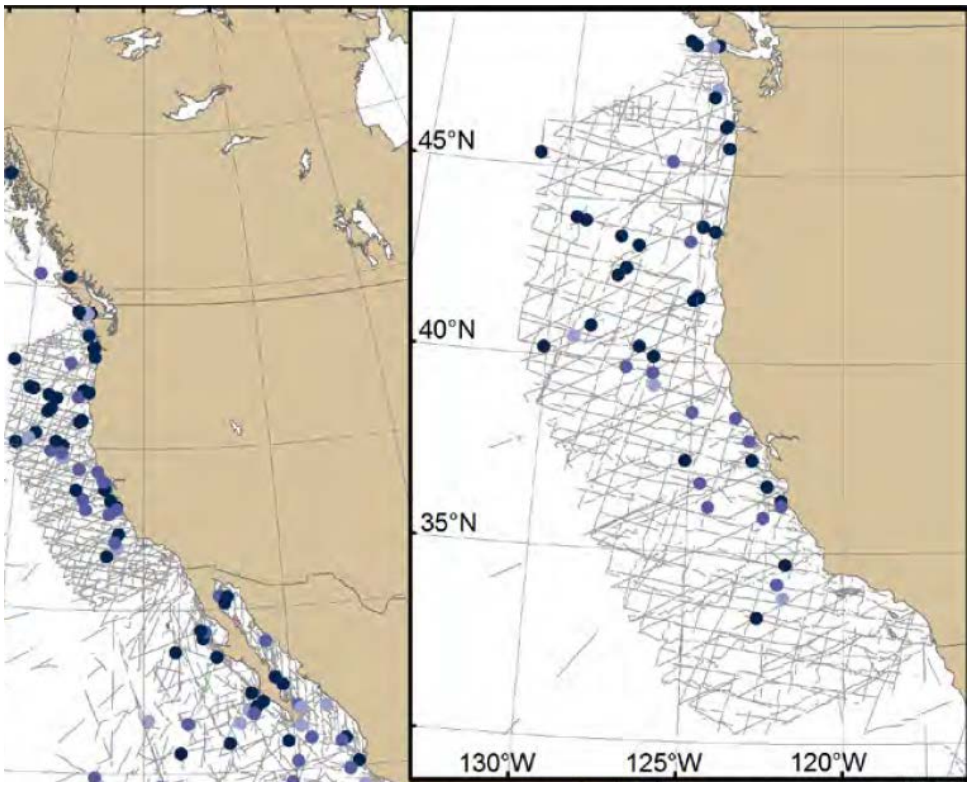
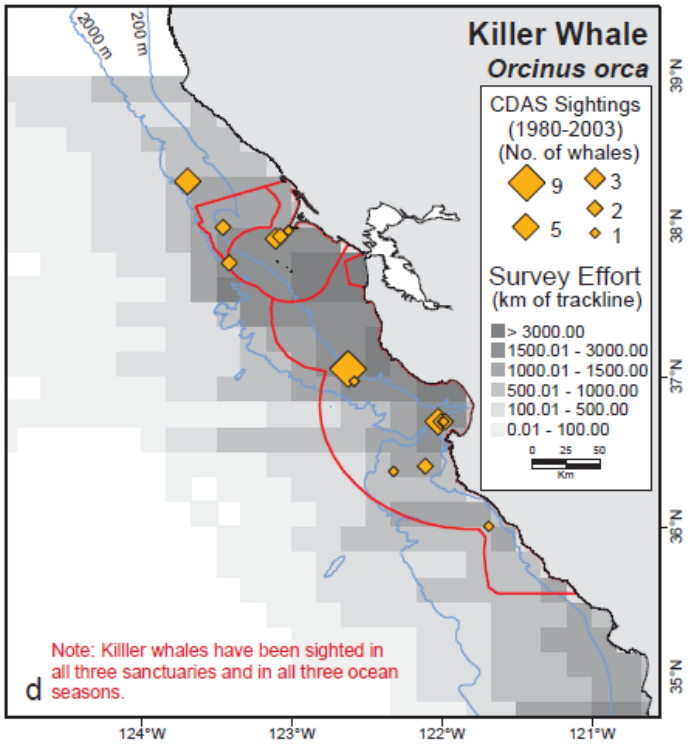


Figure 29. Distribution of killer whale, Orcinus orca, species code 037.

From NOAA 2007:

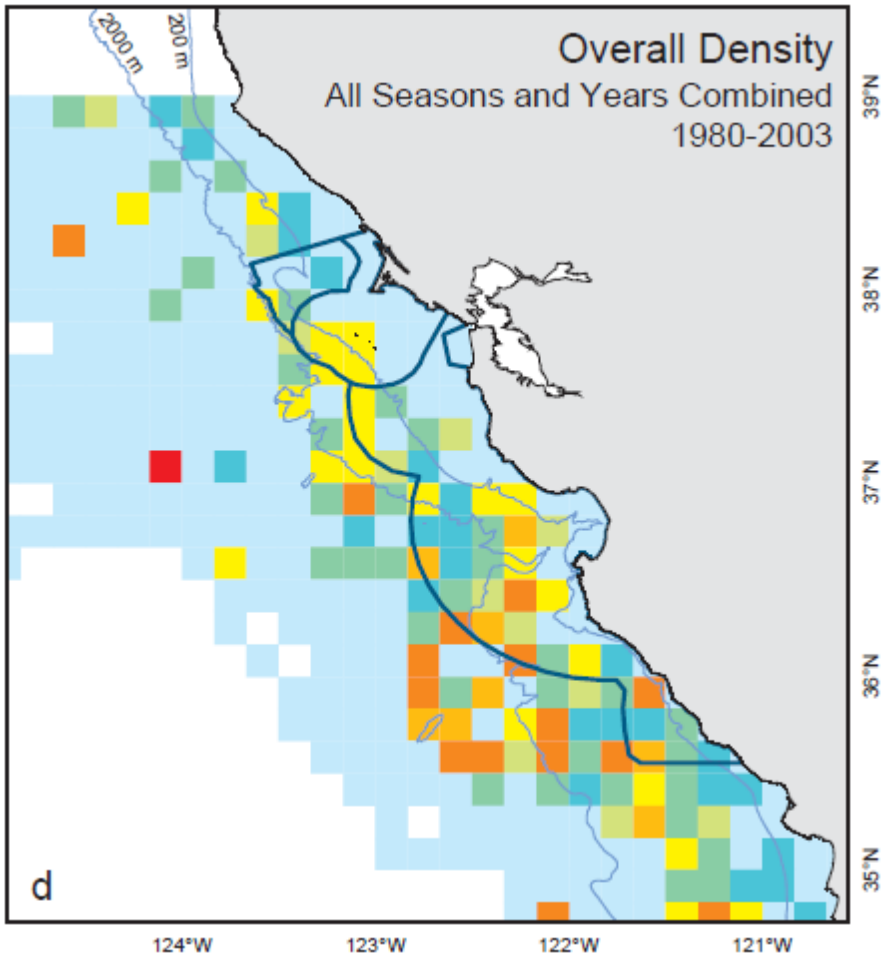


Northern Right Whale Dolphin

From NOAA 2005:

> *Along the west coast of the U.S., northern right-whale dolphins are found primarily in temperate shelf and slope waters. Abundance of this species in California waters is greatest during cold-water months (Forney et al., 1995), and they are thought to range south to Baja California, Mexico during cold periods. Northern right-whale dolphins in U.S. west coast waters are considered a single California/Oregon/Washington stock due to insufficient genetic evidence of subpopulations (Dizon et al., 1994). The size of this stock was estimated in the most recent stock assessment report (Carretta et al., 2002) at 13,705 individuals based on the 1991-1996 SWFSC ship surveys (Barlow 1997). Northern right whale dolphin is not considered threatened or endangered.*
>
> *Northern right-whale dolphins were frequently sighted in shelf and slope waters throughout central and southern California during the SWFSC ship surveys and the CDAS surveys (Figure 6.1.21).*

From NOAA 2007:

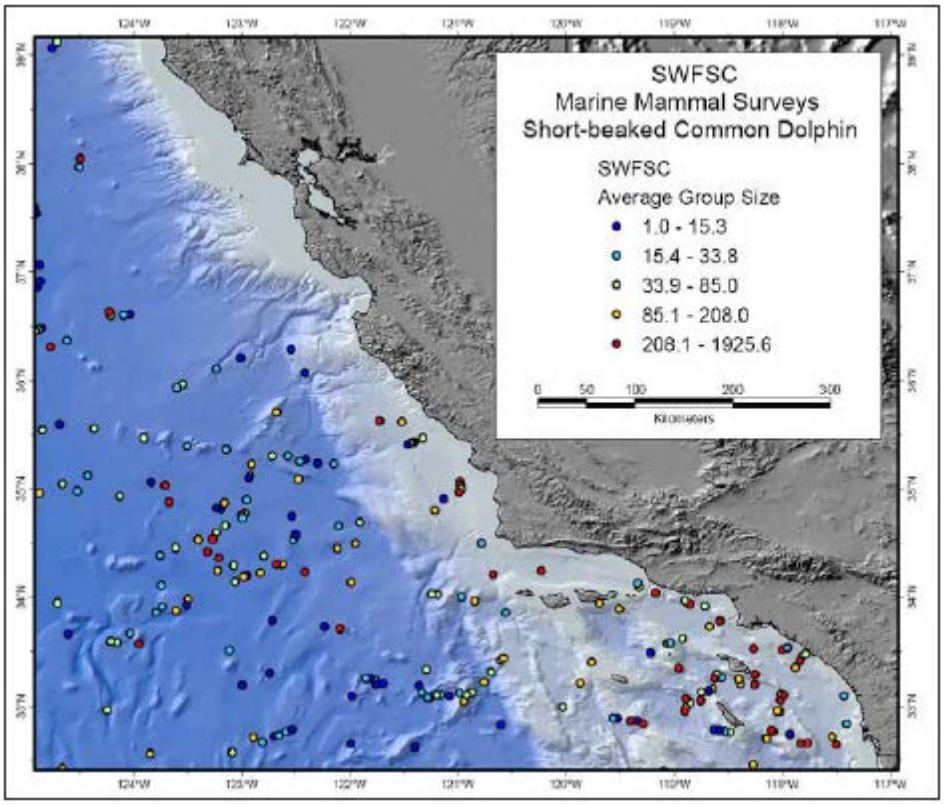


From Navy Monitoring Report 2011:
p. 492 – map of sightings west and northwest of San Clemente Island from September 2010 through May 2011.
p. 516 – coordinates of several sightings, some approx. 5 miles west of northern end of San Clemente Island.

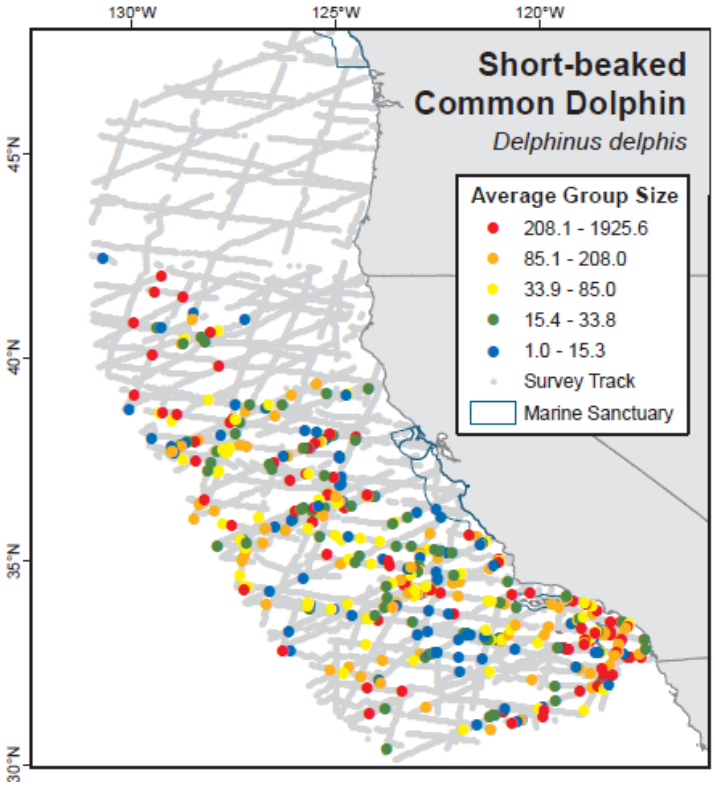
Short-beaked Common Dolphin

From NOAA 2005:

> *Two distinct species of common dolphin, the long-beaked (Delphinus capensis) and the short-beaked (Delphinus delphis) common dolphin, have been recognized in the eastern North Pacific based on genetic and morphological differences (Heyning and Perrin, 1994; Rosel et al., 1994). Within California coastal waters, the distribution of the two species overlaps. Long-beaked common dolphins are found in nearshore (<50 nmi of the coast) waters from Baja California, Mexico to central California. Short-beaked common dolphins have a broader distribution along the west coast of North America, extending from approximately the California/Oregon border south into equatorial waters (Carretta et al., 2002). Short-beaked common dolphins may also be found farther from the coast, with many sightings in the SWFSC ship surveys occurring near the offshore limit (300 nmi) of the survey. Although common dolphins are frequently spotted during aerial surveys, the two species cannot be reliably distinguished from the air (Forney et al., 1995). The most recent abundance estimate for the California stock of long-beaked common dolphin based on data from the 1991-1996 SWFSC ship surveys (Barlow, 1997) is 32,239 individuals (Carretta et al., 2002). Estimated short-beaked common dolphin abundance throughout its U.S. West Coast range, based on the same data, is 373,573 individuals. Although these abundance estimates are for different geographic regions (stock assessments are for individual stocks which may have different geographic boundaries), analysis of the same data restricted to California shows that short-beaked common dolphin are the most abundant cetacean in California waters. The distributions of both species appear to vary seasonally and interannually with highest densities of long-beaks in California waters occurring during warm-water events (Heyning and Perrin, 1994). Neither species of common dolphin is considered a threatened or endangered species.*
>
> …
>
> *Sightings of short-beaked common dolphins were much more numerous and occurred throughout central and southern California shelf and offshore waters, although offshore sightings predominate north of Monterey Bay.*



From NOAA 2007:

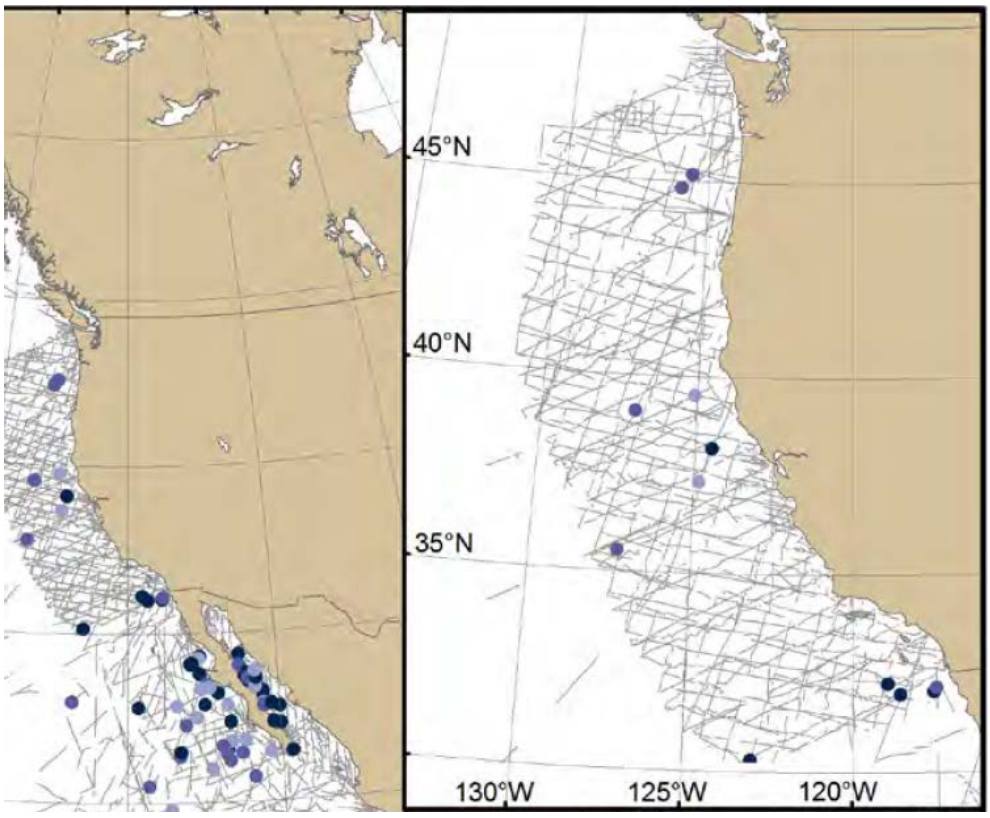


Short Finned Pilot Whale

From NMFS Office of Protected Resources website:

> *Short-finned pilot whales were once commonly seen off Southern California, with an apparently resident population around Santa Catalina Island. After a strong El Niño in 1982-83, short-finned pilot whales virtually disappeared from this area, and despite increased survey effort along the entire U.S. west coast, few sightings were observed from 1984-1992. A 1996 NMFS survey cruise documented a few animals; none were sighted during a 2001 cruise. As these animals may move outside the U.S. "Exclusive Economic Zone", it is hard to determine if these numbers represent a trend.*

From Hamilton et al. 2009:



Sperm Whale

From NMFS Office of Protected Resources website:

> *For management purposes, sperm whales inhabiting U.S. waters have been divided into five stocks:*
>
> *California-Oregon-Washington Stock: Sperm whales are found year-round in California waters, but they reach peak abundance from April through mid-June*

and from the end of August through mid-November. They were seen in every season except winter (Dec-Feb) in Washington and Oregon…The most recent abundance estimate for the period between 1996 and 2001 is 1,233 sperm whales. Sperm whale abundance appears to have been rather variable off California between 1979/1980 and 1996, but does not show any obvious trends.

From NOAA 2007:

Off California, sperm whales occur year-round (Dohl et al., 1983; Forney et al., 1995; Barlow, 1997), with peak abundance from April through mid-June and from end August through mid-November (Rice 1974).

From Navy Monitoring Report 2011:
p. 340:
-20 sperm whales sighted approx. 24 nm west of San Diego, between San Diego and San Clemente Island.
- Sperm whales detected with passive acoustic monitoring offshore of San Clemente and Santa Barbara Islands.
p. 490 - map of sightings from September 2010 through May 2011.

From Hamilton et al. 2009:

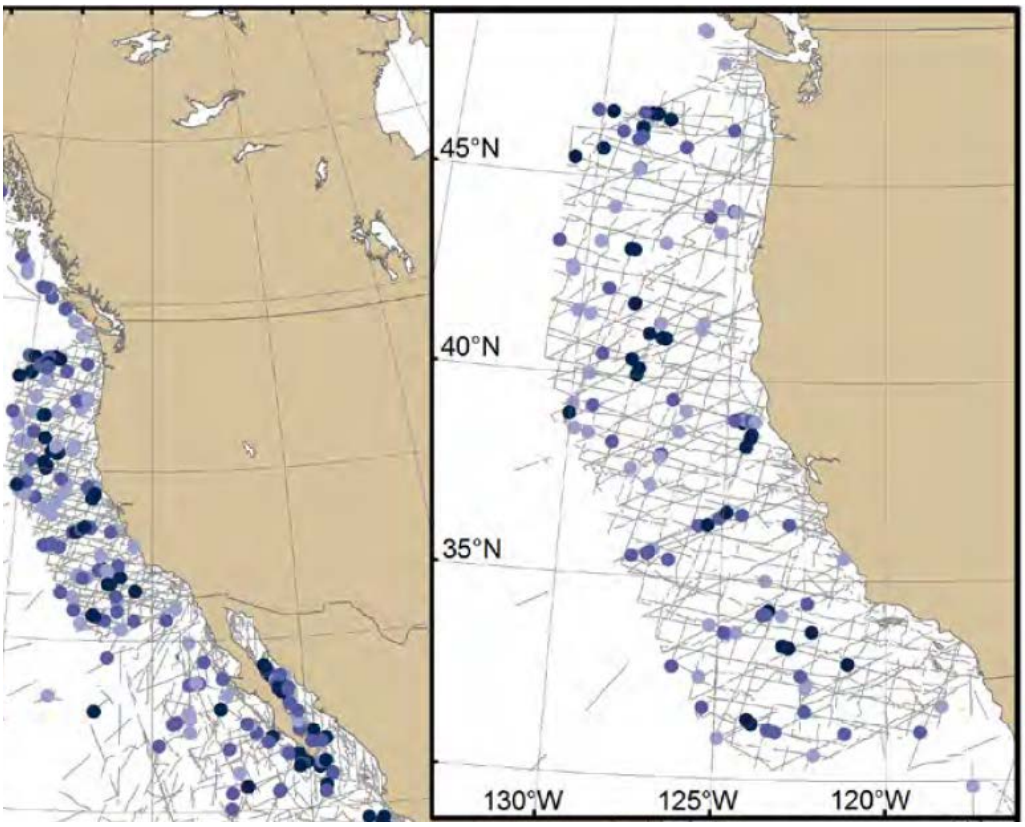


Figure 34. Distribution of sperm whale, Physeter macrocephalus, species code 046.

Bryde's Whale

From NMFS Office of Protected Resources website:

> *For management purposes, Bryde's whales inhabiting U.S. waters have been divided into three stocks: the Eastern Tropical Pacific stock, Hawaiian stock, and Northern Gulf of Mexico stock. The estimated population of Bryde's whales in the eastern tropical Pacific is 11,000-13,000, in the Hawaiian Islands is 350-500, and in the northern Gulf of Mexico is 25-40. Also, there is an estimated population of 12 animals in the coastal waters of California, Oregon, and Washington. There may be up to 90,000-100,000 animals worldwide, with two-thirds occurring in the Northern Hemisphere. There are insufficient data to determine the population trends for this species.*

From Navy Monitoring Report 2009 (p. 81):
Rarely seen Bryde's whale transiting east of San Clemente Island, Oct 2008.

From Navy Monitoring Report 2011:
p. 379 – note of manuscript on Bryde's whale sightings in SoCal Bight
p. 399 – note of three Bryde's or sei whales lunge feeding off of Oxnard
p. 341 – photo and note regarding Bryde's whale sighting off of San Diego
p. 361 – note regarding passive acoustic monitoring recordings of Bryde's whale offshore of San Clemente Island
p. 404 – note regarding Bryde's or sei whale sightings
p. 417 – note regarding three Bryde's/sei whales about 13 miles offshore of San Onofre on 9/28/10
p. 489 - map of sightings from September 2010 through May 2011
p. 569-576 – reference to research publication regarding five Bryde's whale sightings between 2006 and 2010 in SOCAL; suggestion that density/occurrences are increasing.

From Morejohn and Rice 1973:
Confirmed observation one kilometer from shore near La Jolla.

Mesoplodon Beaked Whales (includes 5 species)

From Navy Monitoring Report 2011 (p. 361):
Passive acoustic monitoring recordings off of San Clemente Island.

From Yack 2013:
See discussion and figure below for Cuvier's Beaked Whale.

From Hamilton et al. 2009:

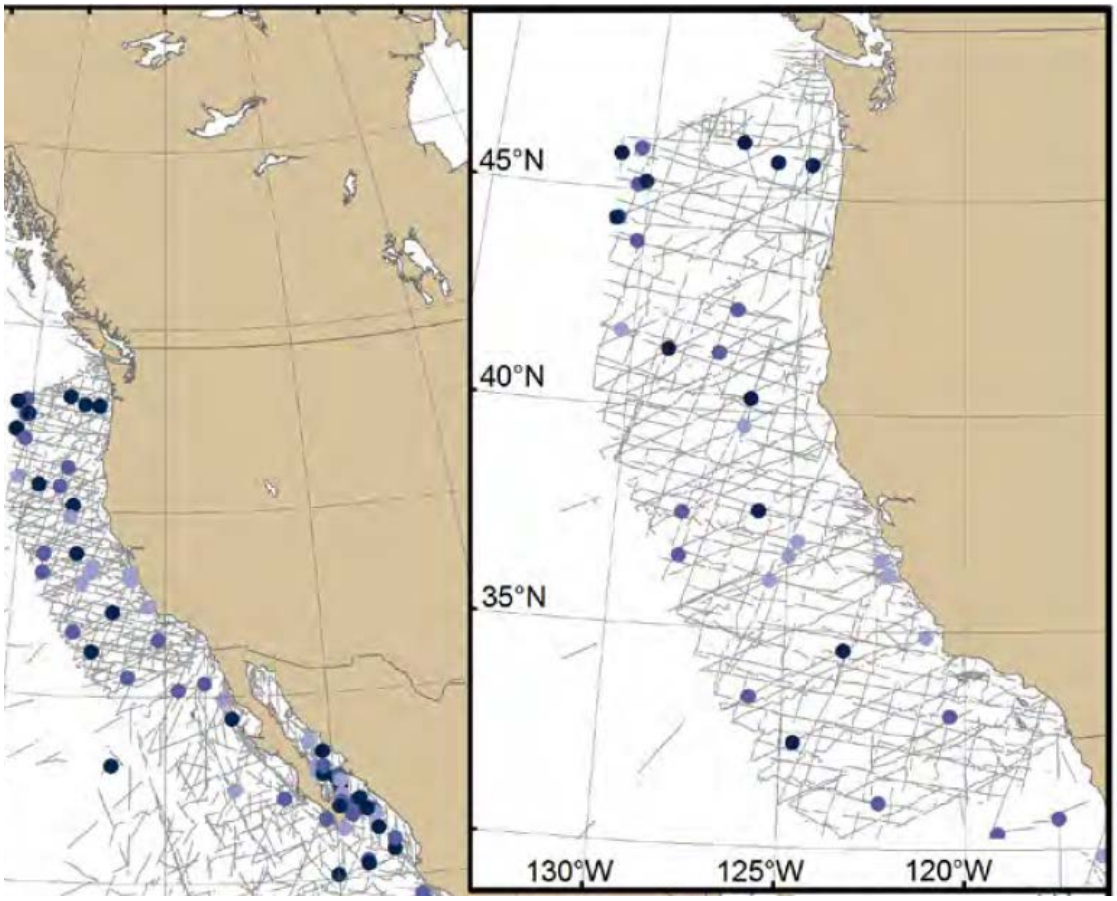


Figure 28. Distribution of unidentified Mesoplodont, Mesoplodon sp., species code 051.

Baird's Beaked Whale

From Yack 2013:
See discussion and figure below for Cuvier's Beaked Whale.

From Navy Monitoring Report 2011 (p. 361):
Passive acoustic monitoring recordings off of San Clemente Island.

From Hildebrand 2012 (p. 33):
Passive acoustic monitoring recordings off of San Clemente and Santa Barbara Islands.

From Hamilton et al. 2009:

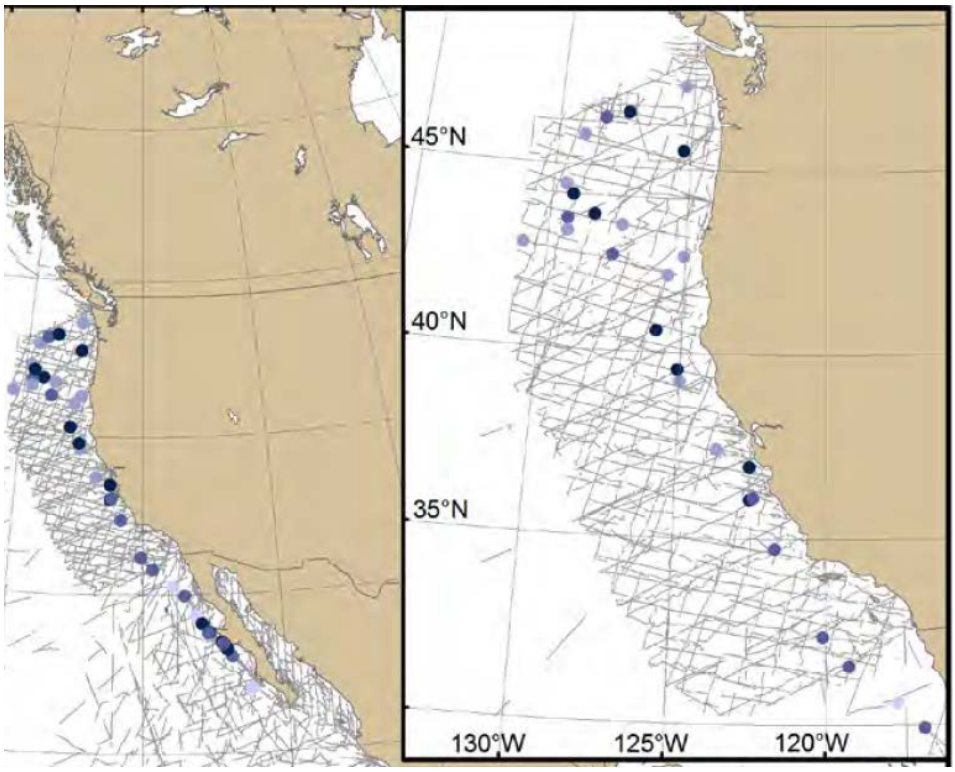


Figure 10. Distribution of Baird's beaked whale, Berarius bairdii, species code 063.

Cuvier's Beaked Whale

From Yack 2013 (p. 124):

> *Beaked whale presence in the deep channel island basins appeared to be stable during survey periods as well as among years (Figure 2) during the months surveyed (Aug – Oct). This suggests that these areas represent important habitat for multiple beaked whale species in the SCB. The ease of access to these relatively near-shore beaked whale habitat regions in the SCB offers a unique opportunity for continued long-term year-round studies using combined visual and acoustic survey techniques.*

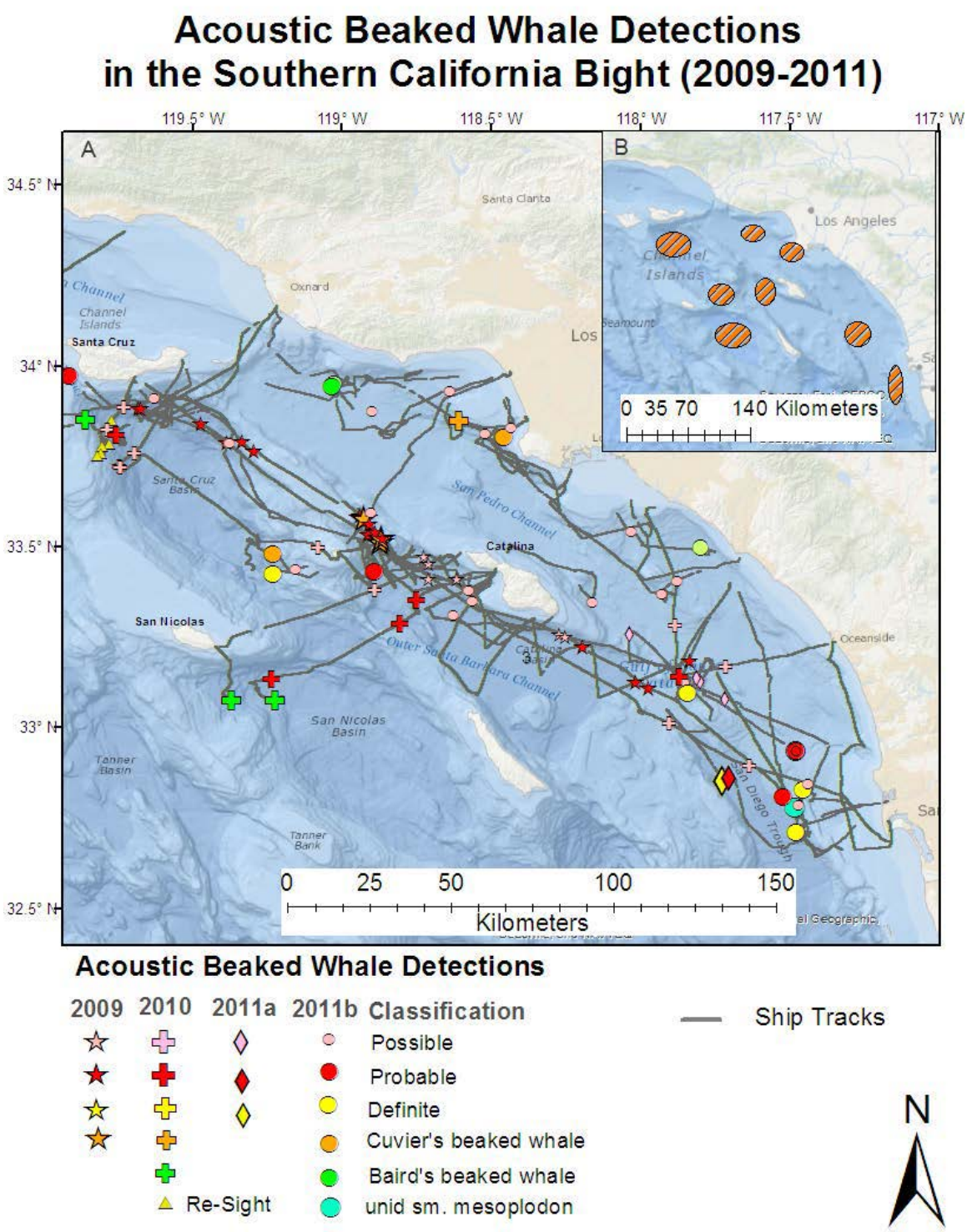


Figure 3. Survey track lines for each year and beaked whale acoustic and combined visual and acoustic encounters for passive acoustic monitoring surveys 2009 (stars); 2010 (crosses); 2011 Trial (diamonds); and 2011(asterisks). The insert depicts the survey area with distinct encounter regions (1-8) shaded in orange.

From Navy Monitoring Report 2009 (p. 108):

satellite tagging for 106 days showed locations within about 10 miles of San Clemente Island. Highest density located approx. three miles east of Tanner Bank.

From Navy Monitoring Report 2010:
Group of beaked whales recorded approximately five miles to the east of the northern tip of San Clemente Island.

From Navy Monitoring Report 2011:
p. 361: passive acoustic recordings offshore of San Clemente Island.
p. 370: satellite tagging of 5 individuals shows close proximity to northern and southern Channel Islands.
p. 387: two CBW seen in the far northwestern corner of SOAR (also see figure 3 of August 2010-July 2011 monitoring report, Appendix B).
p. 404: sighting of two CBW
p. 490: map of sightings from September 2010 through May 2011.

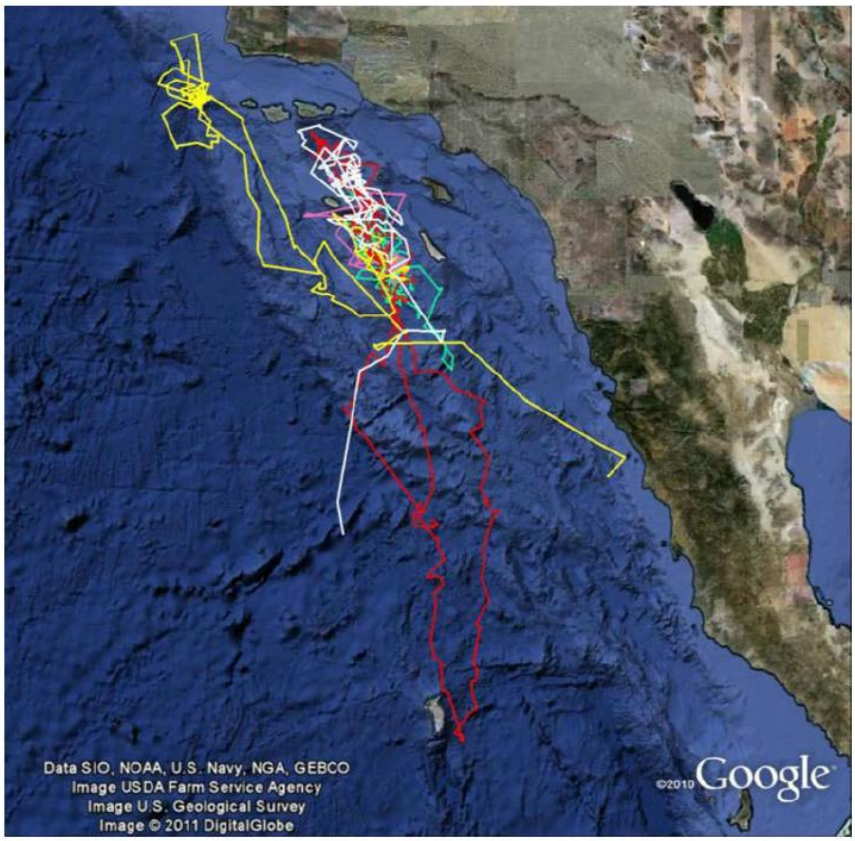
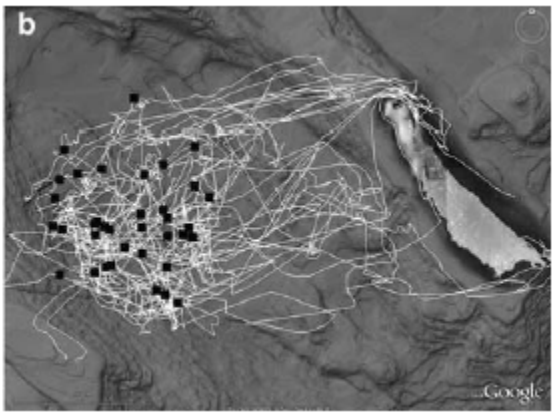


Figure 3. Movements of five Cuvier's beaked whales.

From Falcone et al. 2009:
Sighting info for 37 individual groups of Cuvier's beaked whales- deepest part of San Nicolas Basin and SOAR range.



Northern Fur Seal

From NOAA 2007 (page 187):

> *During the breeding season, approximately 74% of the worldwide population is found on the Pribilof Islands in the southern Bering Sea; within U.S. waters and outside of the Pribilofs, approximately 1% of the population is found in the southern Bering Sea on Bogoslof Island, and on San Miguel Island off southern California (Carretta et al., 2006). A small rookery recently was recently re-established at Southeast Farallon Island (see below). Rookery occupancy is characterized by males arrival in early June followed by female arrival mid-June. Males are generally at the rookery for two months; peak pupping occurs in mid-June – mid-July and lactation lasts about three to four months…*
>
> *…Adult females and juveniles migrate to the central California study area (and Oregon and Washington) from rookeries on San Miguel Island in the southern California Bight (the San Miguel Island stock); (Carretta et al., 2006), and from the Pribilof Islands (the Eastern Pacific stock) in the Bering Sea (Kajimura, 1980; Kenyon and Wilke, 1953; Pyle et al., 2001; Ream et al., 2005).*

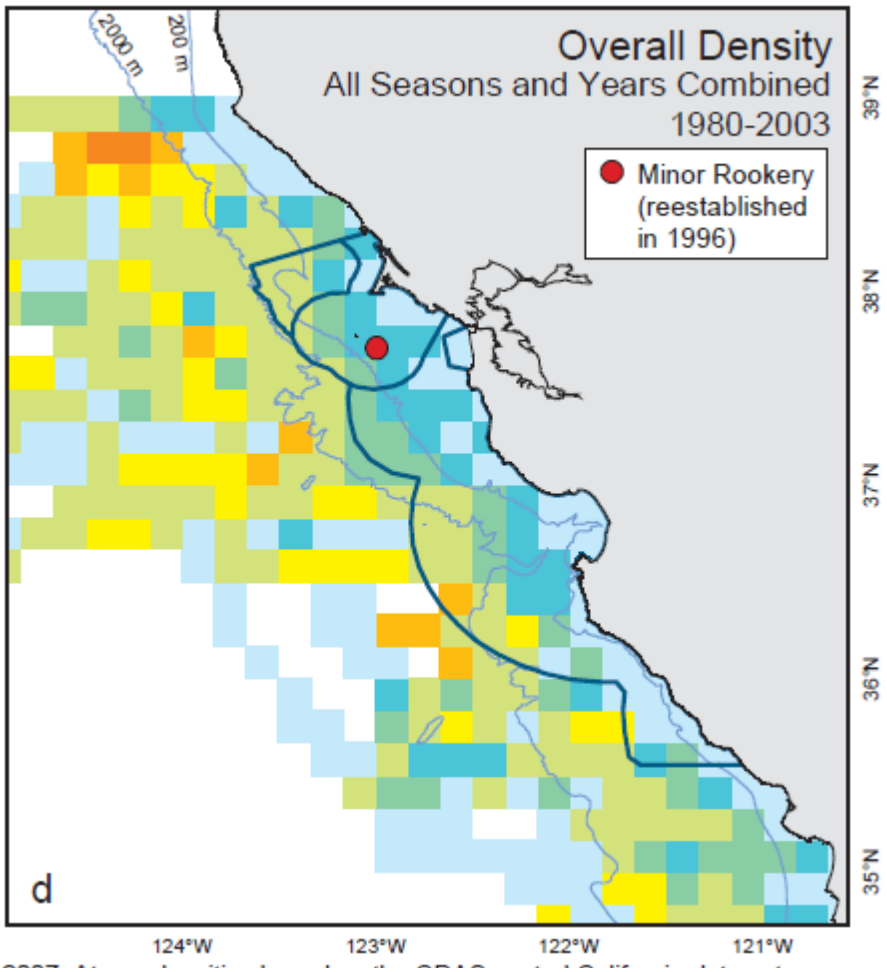


Figure 4.10. Maps for northern fur seal: seasonal and overall densities and rookery location. Densities from CDAS central California dataset (1980-2003) and rookery information from PRBO Conservation Science and the Farallon Islands National Wildlife Refuge.

References:

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NOAA National Centers for Coastal Ocean Science (NCCOS) 2007. *A Biogeographic Assessment of North/Central California: In Support of the National Marine Sanctuaries of Cordell Bank, Gulf of the Farallones and Monterey Bay. Phase II – Environmental Setting and Update to Marine Birds and Mammals.* Prepared by NCCOS's Biogeography Branch, R.G. Ford Consulting Co. and Oikonos Ecosystem Knowledge, in cooperation with the National Marine Sanctuary Program. Silver Spring, MD. NOAA Technical Memorandum NOS NCCOS 40. 302 pp.

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Department of the Navy. 2011. Marine Mammal Monitoring for the U.S. Navy's Hawaii Range Complex and Southern California Range Complex – 2009 Annual Report.

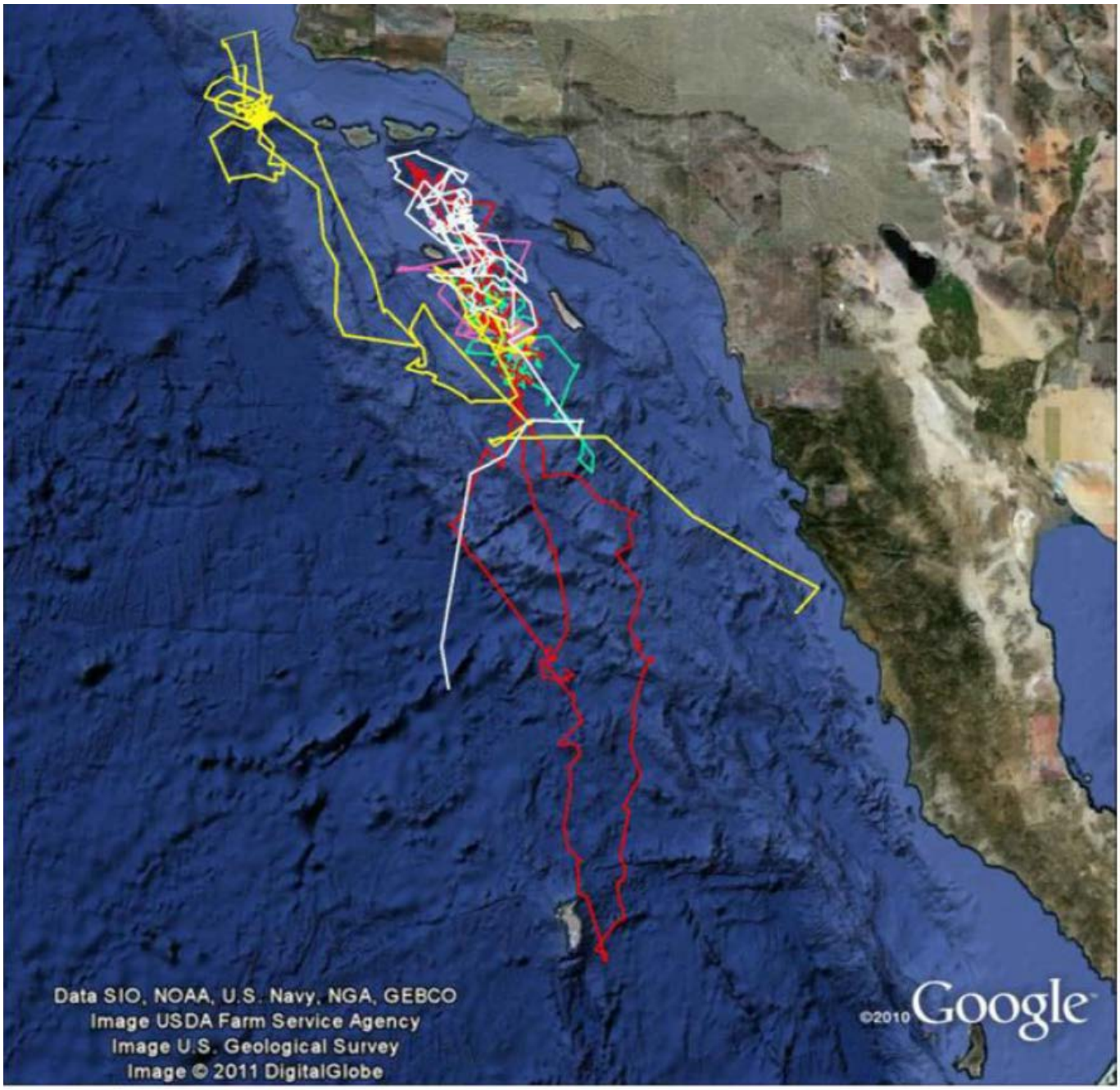


Figure 3. Movements of five Cuvier's beaked whales.

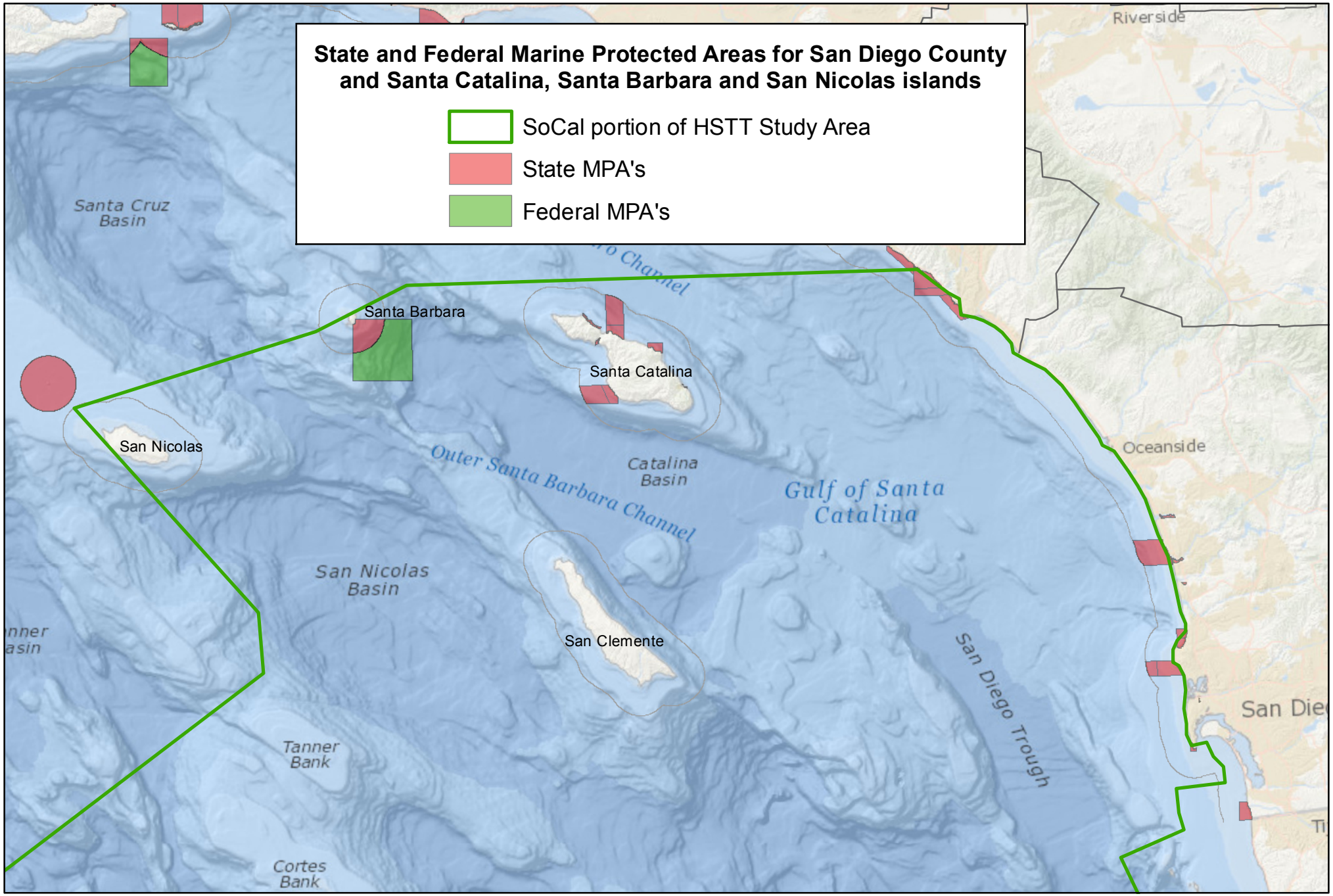
Exhibit 7
CD-008-13
Source: Navy Funded Beaked Whale Research

California Coastal Management Program. Training and testing activities occurring in the Study Area are briefly described in Appendix A.

Table 2-1: Stressors Analyzed for Reasonably Foreseeable Effects on Coastal Zone Uses or Resources

Components and Stressors for Physical Resources	
Sediment and Water Quality	• Explosives and explosive byproducts • Metals • Chemicals other than explosives • Other materials
Air Quality	• Criteria pollutants • Hazardous air pollutants
Components and Stressors for Biological Resources	
Acoustic Stressors	• Sonar and other active acoustic sources • Explosives • Pile driving • Swimmer defense airguns • Weapons firing noise, launch, and impact noise • Vessel noise • Aircraft noise
Energy Stressors	• Electromagnetic devices
Physical Disturbance and Strike Stressors	• Vessels • In-water devices • Military expended materials • Seafloor devices
Entanglement Stressors	• Fiber optic cables and guidance wires • Parachutes
Ingestion Stressors	• Munitions • Military expended materials other than munitions
Secondary Stressors	• Changes in the availability of marine resources • Sediment and water quality
Components and Stressors for Human Resources	
Cultural Resources Stressors	• Acoustic stressors (underwater explosions at depth, cratering from underwater detonations at depth, aircraft and sonic booms, and pile-driving) • Physical disturbance and strike stressors (use of towed-in-water devices, deposition of military expended materials, and use of sea floor devices)
Socioeconomic Stressors	• Accessibility (limiting access to the ocean and the air) • Airborne acoustic stressors (weapons firing, aircraft and vessel noise) • Physical disturbance and strike stressors (aircraft, vessels and in-water devices, and military expended materials) • Secondary stressors (changes in the availability of marine resources)
Public Health and Safety Stressors	• Underwater energy • In-air energy • Physical interactions • Secondary stressors (sediment and water quality)

Exhibit 8
CD-008-13



CALIFORNIA COASTAL COMMISSION

Source: Cal Dept of Fish and Wildlife, ESRI.

Exhibit 9
CD-008-13

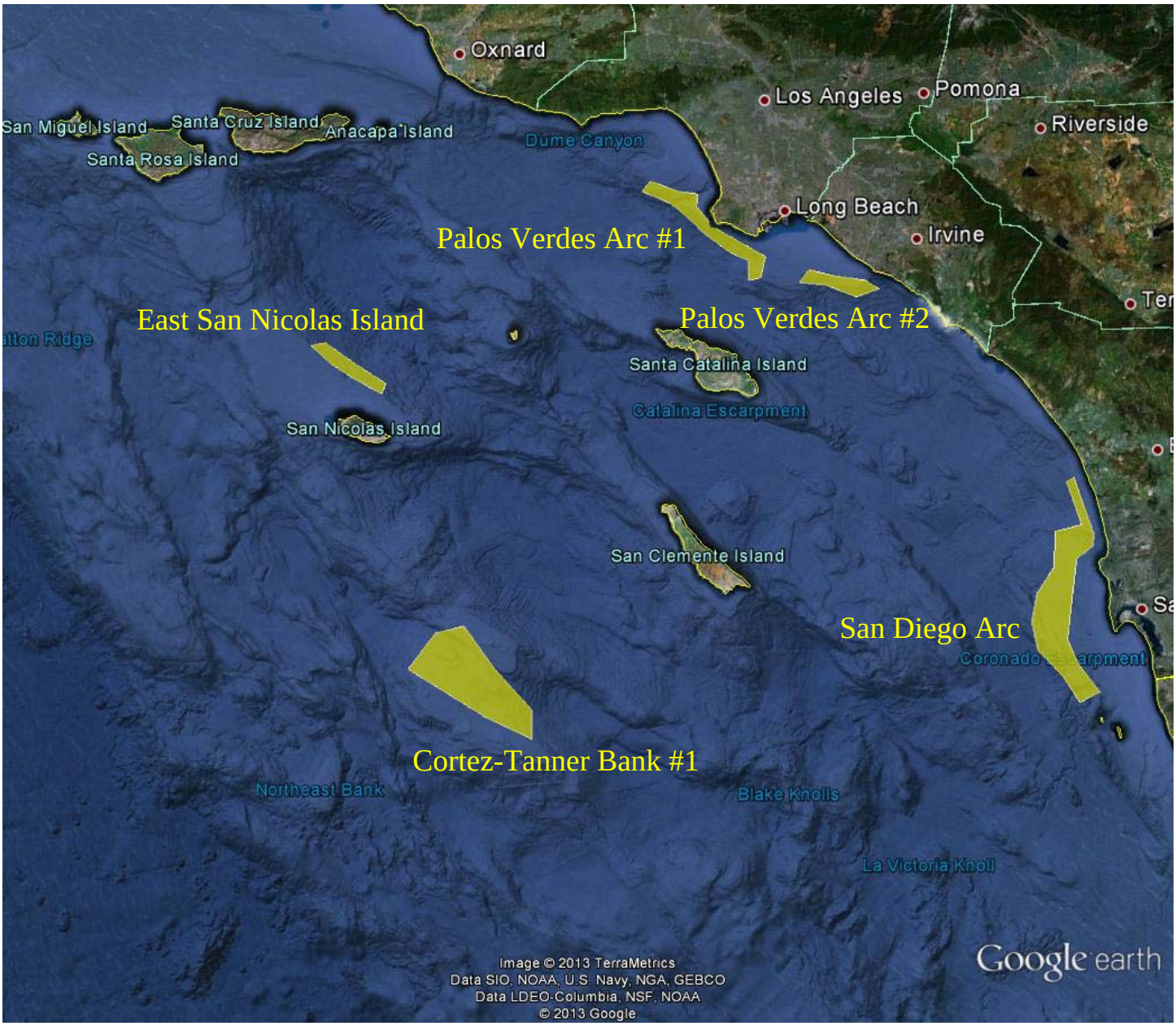


FIGURE 2: Identified biologically important areas for blue whales (Balaenoptera musculus)

Exhibit 10
CD-008-13

variable response that depends on the characteristics of the received signal and prior experience with the received signal.

Other types of stressors include the presence of vessels, fishery interactions, acts of pursuit and capture, the act of stranding, and pollution. In contrast to the limited amount of work performed on stress responses resulting from sound exposure, a considerably larger body of work exists on stress responses associated with pursuit, capture, handling and stranding. Many cetaceans exhibit an apparent vulnerability in the face of these particular situations when taken to the extreme. A recent study compared pathological changes in organs/tissues of odontocetes stranded on beaches or captured in nets over a 40-year period (Cowan and Curry 2008). The type of changes observed indicate harm to multiple systems caused in part by an overload of catecholamines into the system, as well as a restriction in blood supply capable of causing tissue damage or tissue death. This extreme response to a major stressor(s) is thought to be mediated by the overactivation of the animal's normal physiological adaptations to diving or escape. Pursuit, capture, and short-term holding of belugas resulted in a decrease in thyroid hormones (St.Aubin and Geraci 1988) and increases in epinephrine (St.Aubin and Dierauf 2001). In bottlenose dolphins, the trend is more complicated with the duration of the handling time potentially contributing to the magnitude of the stress response (Ortiz and Worthy 2000; St.Aubin 2002; St.Aubin et al. 1996). Male gray seals subjected to capture and short-term restraint showed an increase in cortisol levels accompanied by an increase in testosterone (Lidgard et al. 2008). This result may be indicative of a compensatory response that enables the seal to maintain reproduction capability in spite of stress. Elephant seals demonstrate an acute cortisol response to handling but do not demonstrate a chronic response; on the contrary, adult females demonstrate a reduction in the adrenocortical response following repetitive chemical immobilization (Engelhard et al. 2002). Similarly, no correlation between cortisol levels and heart or respiration rate changes were seen in harbor porpoises during handling for satellite tagging (Eskesen et al. 2009). Taken together, these studies illustrate the wide variations in the level of response that can occur when faced with these stressors.

Factors to consider when trying to predict a stress or cueing response include the mammal's life history stage and whether they are naïve or experienced with the sound. Prior experience with a stressor may be of particular importance as repeated experience with a stressor may dull the stress response via acclimation (St.Aubin and Dierauf 2001).

The sound characteristics that correlate with specific stress responses in marine mammals are poorly understood. Therefore, in practice, a stress response is assumed if a physiological reaction such as a hearing loss or trauma is predicted; or if a significant behavioral response is predicted.

6.1.2.9 Behavioral Reactions

The response of a marine mammal to an anthropogenic sound will depend on the frequency, duration, temporal pattern and amplitude of the sound as well as the animal's prior experience with the sound and the context in which the sound is encountered (i.e., what the animal is doing at the time of the exposure). The distance from the sound source and whether it is perceived as approaching or moving away can also affect the way an animal responds to a sound (Wartzok et al. 2003). For marine mammals, a review of responses to anthropogenic sound was first conducted by Richardson and others (Richardson et al. 1995b). More recent reviews (Nowacek et al. 2007; Southall et al. 2007b) address studies conducted since 1995 and focus on observations where the received sound level of the exposed marine mammal(s) was known or could be estimated.

Exhibit 11
CD-008-13

Except for some vocalization changes in response to auditory masking, all behavioral reactions are assumed to occur due to a preceding stress or cueing response; however, stress responses cannot be predicted directly due to a lack of scientific data (see preceding section). Responses can overlap; for example, an increased respiration rate is likely to be coupled to a flight response. Differential responses between and within species are expected since hearing ranges vary across species and the behavioral ecologies of individual species are unlikely to completely overlap.

Southall et al. (Southall et al. 2007b) synthesized data from many past behavioral studies and observations to determine the likelihood of behavioral reactions at specific sound levels. While in general, the louder the sound source the more intense the behavioral response, it was clear that the proximity of a sound source and the animal's experience, motivation, and conditioning were also critical factors influencing the response (Southall et al. 2007b). After examining all of the available data, the authors felt that the derivation of thresholds for behavioral response based solely on exposure level was not supported because context of the animal at the time of sound exposure was an important factor in estimating response. Nonetheless, in some conditions, consistent avoidance reactions were noted at higher sound levels depending on the marine mammal species or group allowing conclusions to be drawn. Most low-frequency cetaceans (mysticetes) observed in studies usually avoided sound sources at levels of less than or equal to 160 dB re 1 µPa. Published studies of mid-frequency cetaceans analyzed include sperm whales, belugas, bottlenose dolphins, and river dolphins. These groups showed no clear tendency, but for non-impulsive sounds, captive animals tolerated levels in excess of 170 dB re 1 µPa before showing behavioral reactions, such as avoidance, erratic swimming, and attacking the test apparatus. High-frequency cetaceans (observed from studies with harbor porpoises) exhibited changes in respiration and avoidance behavior at levels between 90 and 140 dB re 1 µPa, with profound avoidance behavior noted for levels exceeding this. Phocid seals showed avoidance reactions at or below 190 dB re 1 µPa; thus, seals may actually receive levels adequate to produce TTS before avoiding the source. Recent studies with beaked whales have shown them to be particularly sensitive to noise, with animals during three playbacks of sound breaking off foraging dives at levels below 142 dB sound pressure level, although acoustic monitoring during actual sonar exercises revealed some beaked whales continuing to forage at levels up to 157 dB sound pressure level (Tyack et al. 2011).

6.1.2.10 Behavioral Reactions to Sonar and other Active Acoustic Sources

6.1.2.11 Mysticetes

Specific to U.S. Navy systems using low-frequency sound, studies were undertaken in 1997–98 pursuant to the Navy's Low-Frequency Sound Scientific Research Program. These studies found only short-term responses to low-frequency sound by mysticetes (fin, blue, and humpback whales), including changes in vocal activity and avoidance of the source vessel (Clark and Fristrup 2001; Croll et al. 2001; Fristrup et al. 2003; Miller et al. 2000; Nowacek et al. 2007). Baleen whales exposed to moderate low-frequency signals demonstrated no variation in foraging activity (Croll et al. 2001). However, five out of six North Atlantic right whales exposed to an acoustic alarm interrupted their foraging dives, although the alarm signal was long in duration, lasting several minutes, and purposely designed to elicit a reaction from the animals as a prospective means to protect them from ship strikes (Nowacek et al. 2004a). Although the animal's received sound pressure level was similar in the latter two studies (133–150 dB sound pressure level), the frequency, duration, and temporal pattern of signal presentation were different. Additionally, the right whales did not respond to playbacks of either right whale social sounds or vessel noise, highlighting the importance of the sound characteristics, species differences, and individual sensitivity in producing a behavioral reaction.

Low-frequency signals of the Acoustic Thermometry of Ocean Climate sound source were not found to affect dive times of humpback whales in Hawaiian waters (Frankel and Clark 2000) or to overtly affect elephant seal dives (Costa et al. 2003). However, they did produce subtle effects that varied in direction and degree among the individual seals, again illustrating the equivocal nature of behavioral effects and consequent difficulty in defining and predicting them.

Blue whales exposed to mid-frequency sonar in the Southern California Bight were less likely to produce low frequency calls usually associated with feeding behavior (Melcón et al. 2012). It is not known whether the lower rates of calling actually indicated a reduction in feeding behavior or social contact since the study used data from remotely deployed, passive acoustic monitoring buoys. In contrast, blue whales increased their likelihood of calling when ship noise was present, and decreased their likelihood of calling in the presence of explosive noise, although this result was not statistically significant (Melcón et al. 2012). Additionally, the likelihood of an animal calling decreased with the increased received level of mid-frequency sonar, beginning at a sound pressure level of approximately 110 to 120 dB re 1 µPa (Melcón et al. 2012). Preliminary results from the 2010–2011 field season of the ongoing behavioral response study in southern California waters indicated that in some cases and at low received levels, tagged blue whales responded to mid-frequency sonar but that those responses were mild and there was a quick return to their baseline activity (Southall et al. 2011). These preliminary findings from Melcón et al. (2012) and Southall et al. (2011) are consistent with the Navy's criteria and thresholds for predicting behavioral effects to mysticetes (including blue whales) from sonar and other active acoustic sources used in the quantitative acoustic effects analysis (see Section 6.1.6, Quantitative Analysis below). The behavioral risk function predicts a probability of a substantive behavioral reaction for individuals exposed to a received sound pressure level of 120 dB re 1µPa or greater, with an increasing probability of reaction with increased received level as demonstrated in Melcón et al. (2012).

6.1.2.12 Odontocetes

From 2007 to 2011, behavioral response studies were conducted through the collaboration of various research organizations in the Bahamas, Southern California, the Mediterranean, Cape Hatteras, and Norwegian waters. These studies attempted to define and measure responses of beaked whales and other cetaceans to controlled exposures of sonar and other sounds to better understand their potential impacts. Results from the 2007–2008 study conducted near the Bahamas showed a change in diving behavior of an adult Blainville's beaked whale to playback of mid-frequency source and predator sounds (Boyd et al. 2008; Tyack et al. 2011). Reaction to mid-frequency sounds included premature cessation of clicking and termination of a foraging dive, and a slower ascent rate to the surface. Preliminary results from a similar behavioral response study in southern California waters have been presented for the 2010–2011 field season (Southall et al. 2011). Cuvier's beaked whale responses suggested particular sensitivity to sound exposure as consistent with results for Blainville's beaked whale. Similarly, beaked whales exposed to sonar during British training exercises stopped foraging (DSTL 2007), and preliminary results of controlled playback of sonar may indicate feeding/foraging disruption of killer whales and sperm whales (Miller et al. 2011).

In the 2007–2008 Bahamas study, playback sounds of a potential predator–a killer whale–resulted in a similar but more pronounced reaction, which included longer inter-dive intervals and a sustained straight-line departure of more than 20 km from the area. The authors noted, however, that the magnified reaction to the predator sounds could represent a cumulative effect of exposure to the two sound types since killer whale playback began approximately 2 hours after mid-frequency source playback. Pilot whales and killer whales off Norway also exhibited horizontal avoidance of a transducer with outputs in the mid-frequency range (signals in the 1 kHz – 2 kHz and 6 kHz to 7 kHz ranges) (Miller

et al. 2011). Additionally, separation of a calf from its group during exposure to mid-frequency sonar playback was observed (Miller et al. 2011). In contrast, preliminary analyses suggest that none of the pilot whales or false killer whales in the Bahamas showed an avoidance response to controlled exposure playbacks (Southall et al. 2009).

Through analysis of the behavioral response studies, a preliminary overarching effect of greater sensitivity to all anthropogenic exposures was seen in beaked whales compared to the other odontocetes studied (Southall et al. 2009). Therefore, recent studies have focused specifically on beaked whale responses to active sonar transmissions or controlled exposure playback of simulated sonar on various military ranges (Claridge and Durban 2009; DSTL 2007; McCarthy et al. 2011; Moretti et al. 2009; Tyack et al. 2011). In the Bahamas, Blainville's beaked whales located on the range will move off-range during sonar use and return only after the sonar transmissions have stopped, sometimes taking several days to do so (Claridge and Durban 2009; McCarthy et al. 2011; Moretti et al. 2009; Tyack et al. 2011).

In May 2003, killer whales in Haro Strait, Washington exhibited what were believed by some observers to be aberrant behaviors, which were observed while the USS Shoup was in the vicinity and engaged in mid-frequency active sonar operations. Sound fields modeled for the USS Shoup transmissions (U.S. Department of the Navy 2004; Fromm 2009; NMFS (Office of Protected Resources) 2005) estimated a mean received sound pressure level of approximately 169.3 dB re 1µPa at the location of the killer whales at the closest point of approach between the animals and the vessel (estimated sound pressure levels ranged from 150 to 180 dB re 1µPa).

Research on sperm whales near the Grenadines (Caribbean) in 1983 coincided with the U.S. intervention in Grenada, where animals were observed scattering and leaving the area in the presence of military sonar, presumably from nearby submarines (Watkins et al. 1985b; Watkins and Schevill 1975). The authors did not report received levels from these exposures and reported similar reactions from noise generated by banging on their boat hull. It was unclear if the sperm whales were reacting to the sonar signal itself or to a potentially new unknown sound in general. Additionally, sperm whales in the Caribbean stopped vocalizing when presented with sounds from nearby acoustic pingers (Watkins and Schevill 1975).

Researchers at the Navy's Marine Mammal Program facility in San Diego, California have conducted a series of controlled experiments on bottlenose dolphins and beluga whales to study TTS (Finneran et al. 2003a; Finneran et al. 2001; Finneran et al. 2005a; Finneran and Schlundt 2004; Schlundt et al. 2000). Ancillary to the TTS studies, scientists evaluated whether the marine mammals performed their trained tasks when prompted, during and after exposure to mid-frequency tones. Altered behavior during experimental trials usually involved refusal of animals to return to the site of the sound stimulus. This refusal included what appeared to be deliberate attempts to avoid a sound exposure or to avoid the location of the exposure site during subsequent tests (Finneran et al. 2002a; Schlundt et al. 2000). Bottlenose dolphins exposed to 1-second intense tones exhibited short-term changes in behavior above received sound levels of 178 to 193 dB re 1 µPa root mean square, and beluga whales did so at received levels of 180 to 196 dB re 1 µPa and above. In some instances, animals exhibited aggressive behavior toward the test apparatus (Ridgway et al. 1997; Schlundt et al. 2000). While these studies were generally not designed to test avoidance behavior and animals were commonly reinforced with food, the controlled environment and ability to measure received levels provide insight on received levels at which animals will behaviorally responds to noise sources.

Studies with captive harbor porpoises showed increased respiration rates upon introduction of acoustic alarms, such as those used on fishing nets to help deter marine mammals from becoming caught or entangled (Kastelein et al. 2006; Kastelein et al. 2001) and emissions for underwater data transmission (Kastelein et al. 2005c). However, exposure of the same acoustic alarm to a striped dolphin under the same conditions did not elicit a response (Kastelein et al. 2006), again highlighting the importance in understanding species differences in the tolerance of underwater noise.

6.1.2.13 Pinnipeds

Different responses displayed by captive and wild phocid seals to sound judged to be "unpleasant" have been reported; where captive seals habituated (did not avoid the sound), and wild seals showed avoidance behavior (Götz and Janik 2010). Captive seals received food (reinforcement) during sound playback, while wild seals were exposed opportunistically. These results indicate that motivational state (e.g., reinforcement via food acquisition) can be a factor in whether or not an animal habituates to novel or unpleasant sounds. Another study found that captive hooded seals reacted to 1–7 kHz sonar signals, in part with displacement to the areas of least sound pressure level, at levels between 160 and 170 dB re 1 µPa (Kvadsheim et al. 2010).

Captive studies with other pinnipeds have shown a reduction in dive times when presented with qualitatively unpleasant sounds. These studies indicated that the subjective interpretation of the pleasantness of a sound, as opposed to the more commonly studied factor of received sound level, can affect diving behavior (Götz and Janik 2010).

6.1.2.14 Behavioral Reactions to Impulsive Sound Sources

6.1.2.15 Mysticetes

Baleen whales have shown a variety of responses to impulsive sound sources, including avoidance, reduced surface intervals, altered swimming behavior, and changes in vocalization rates (Gordon et al. 2003; Richardson et al. 1995b; Southall et al. 2007b). While most bowhead whales did not show active avoidance until within 8 km of seismic vessels (Richardson et al. 1995b), some whales avoided vessels by more than 20 km at received levels as low as 120 dB re 1 µPa rms. Additionally, Malme et al. (1988) observed clear changes in diving and respiration patterns in bowheads at ranges up to 73 km from seismic vessels, with received levels as low as 125 dB re 1 µPa.

Gray whales migrating along the U.S. west coast showed avoidance responses to seismic vessels by 10 percent of animals at 164 dB re 1 µPa, and by 90 percent of animals at 190 dB re 1 µPa, with similar results for whales in the Bering Sea (Malme et al. 1988; Malme et al. 1986). In contrast, noise from seismic surveys was not found to impact feeding behavior or exhalation rates while resting or diving in western gray whales off the coast of Russia (Gailey et al. 2007; Yazvenko et al. 2007).

Humpback whales showed avoidance behavior at ranges of 5–8 km from a seismic array during observational studies and controlled exposure experiments in western Australia (McCauley et al. 1998). Todd et al. (1996) found no clear short-term behavioral responses by foraging humpbacks to explosions associated with construction operations in Newfoundland but did see a trend of increased rates of net entanglement and a shift to a higher incidence of net entanglement closer to the noise source.

Seismic pulses at average received levels of 131 dB re 1 µPa2s caused blue whales to increase call production (Di Iorio and Clark 2010). In contrast, McDonald et al. (1995) tracked a blue whale with seafloor seismometers and reported that it stopped vocalizing and changed its travel direction at a

(behaviorally or physiologically) to the specific stressors associated with the action (in specific contexts, where possible, e.g., at what distance or received level);

- An increase in our understanding of how anticipated individual responses, to individual stressors or anticipated combinations of stressors, may impact either: (1) the long-term fitness and survival of an individnal; or (2) the popnlation, species, or stock (e.g., through effects on annual rates of recruitment or survival);
- An increase in our understanding of the effectiveness of mitigation and monitoring measures;
- A better understanding and record of the manner in which the authorized entity complies with the ITA and Incidental Take Statement;
- An increase in the probability of detecting marine mammals (through improved technology or methods), both specifically within the safety zone (thus allowing for more effective implementation of the mitigation) and in general, to better achieve the above goals; and
- A reduction in the adverse impact of activities to the least practicable level, as defined in the MMPA.

While the ICMP only directly applies to monitoring activities under applicable MMPA and ESA authorizations, it also serves to facilitate coordination among the Navy's marine species monitoring program and the basic and applied research programs discussed in the Ongoing Navy-funded Research section of this document.

An October 2010 Navy monitoring meeting initiated a process to critically evaluate current Navy monitoring plans and begin development of revisions to existing range-specific monitoring plans and associated updates to the ICMP. Discussions at that meeting and through the Navy/NMFS adaptive management process established a way ahead for continued refinement of the Navy's monitoring program. This process included establishing a Scientific Advisory Group (SAG) composed of technical experts to provide objective scientific guidance for Navy consideration. The Navy established the SAG in early 2011 with the initial task of evaluating current Navy monitoring approaches under the ICMP and existing LOAs and developing objective scientific recommendations that would serve as the basis for a Strategic Planning Process for Navy monitoring to be incorporated as a major component of the ICMP. The SAG convened in March 2011, composed of leading academic and civilian scientists with significant expertise in marine species monitoring, acoustics, ecology, and modeling. The SAG's final report laid out both over-arching and range-specific recommendations for the Navy's Marine Species Monitoring program and is available through the Navy's Marine Species Monitoring web portal: *http://www.navymarinespeciesmonitoring.us.*

Adaptive management discussions between the Navy and NMFS established a way ahead for continued refinement of the Navy's monitoring program. Consensus was that the ICMP and associated implementation components would continue the evolution of Navy marine species monitoring towards a single integrated program, incorporate SAG recommendations when appropriate and logistically feasible, and establish a more collaborative framework for evaluating, selecting, and implementing future monitoring across all the Navy range complexes through the adaptive management and strategic planning process.

Past and Current Monitoring in the HSTT Study Area

NMFS has received multiple years' worth of annual exercise and monitoring reports addressing active sonar use and explosive detonations within the HRC, SOCAL Range Complex, and SSTC. The data and information contained in these reports have been considered in developing mitigation and monitoring measures for the proposed training and testing activities within the HSTT Study Area. The Navy's annual exercise and monitoring reports may be viewed at: *http://www.nmfs.noaa.gov/pr/permits/incidental.htm#applications* and *http://www.navymarinespeciesmonitoring.us.* NMFS has reviewed these reports and summarized the results, as related to marine mammal monitoring, below.

1. The Navy has shown significant initiative in developing its marine species monitoring program and made considerable progress toward reaching goals and objectives of the ICMP.

2. Observation data from watchstanders aboard navy vessels is generally useful to indicate the presence or absence of marine mammals within the mitigation zones (and sometimes beyond) and to document the implementation of mitigation measures, but does not provide useful species-specific information or behavioral data.

3. Data gathered by experienced marine mammal observers can provide very valuable information at a level of detail not possible with watchstanders.

4. Though it is by no means conclusive, it is worth noting that no instances of obvious behavioral disturbance have been observed by Navy watchstanders or experienced marine mammal observers conducting visual monitoring.

5. Visual surveys generally provide suitable data for addressing questions of distribution and abundance of marine mammals, but are much less effective at providing information on movements and behavior, with a few notable exceptions where sightings are most frequent. For example, Navy-funded focal follows of marine mammals during aerial visual surveys in SOCAL have provided unique new science on regional at-sea marine mammal behavior including group size, travel direction, spatial occurrence within SOCAL, maximum inter-animal dispersal, and behavioral state.

6. Passive acoustics and animal tagging have significant potential for applications addressing animal movements and behavioral response to Navy training activities, but require a longer time horizon and heavy investment in analysis to produce relevant results.

7. NMFS and the Navy should more carefully consider what and how informatiou should be gathered by watchstanders during training exercises and monitoring events, as some reports contain different information, making cross-report comparisons difficult.

Navy-funded monitoring accomplishments in the HRC and SOCAL portions of HSTT from 2009 to 2012 are provided in the Navy's draft 5-year Comprehensive Report, as required by the 2009 rulemakings and available here: *http://www.nmfs.noaa.gov/pr/permits/incidental.htm#applications.* Following is a summary of the work conducted:

- Conducted over 4,000 hours of visual survey effort;
- Covered over 64,800 nautical miles of ocean;
- Sighted over 256,000 individual marine mammals;
- Taken over 45,500 digital photos and 32 hours of digital video;
- Attached 70 satellite tracking tags to individual marine mammals; and
- Collected over 25,000 hours of passive acoustic recordings.

Some recent highlights of findings include:

- Increased understanding of Hawaiian monk seal habitat use and behavior throughout the Main Hawaiian Islands;
- Estimated received levels and reconstructions of animal movements during an ASW training event from the bottom-mounted hydrophone arrays at the Pacific Missile Range Facility;

Exhibit 12
CD-008-13

- Increased knowledge of baseline marine mammal behavior information in SOCAL from focal follows of priority cetacean species; and
- Observed northern right whale dolphin mother-calf pairs for the first time since SOCAL aerial monitoring surveys began in fall 2008.

Data collection and analysis within these range complexes is ongoing. From 2009 to 2011, Navy lookouts aboard Navy ships reported 1,262 sightings for an estimated 12,875 marine mammals within the HSTT Study Area. These observations were mainly during major at-sea training events and there were no reported observations of adverse reactions by marine mammals and no dead or injured animals reported associated with Navy training activities.

Proposed Monitoring for the HSTT Study Area

Based on discussions between the Navy and NMFS, future monitoring would address the ICMP top-level goals through a collection of specific regional and ocean basin studies based on scientific objectives. Quantitative metrics of monitoring effort (e.g., 20 days of aerial survey) would not be a specific requirement. The adaptive management process and reporting requirements would serve as the basis for evaluating performance and compliance, primarily considering the quality of the work and results produced, as well as peer review and publications, and public dissemination of information, reports, and data. The strategic planning process would be used to set intermediate scientific objectives, identify potential species of interest at a regional scale, and evaluate and select specific monitoring projects to fund or continue supporting for a given fiscal year. The strategic planning process would also address relative investments to different range complexes based on goals across all range complexes, and monitoring would leverage multiple techniques for data acquisition and analysis whenever possible.

Ongoing Navy Research

Overview

The Navy is one of the world's leading organizations in assessing the effects of human activities on the marine environment, and provides a significant amount of funding and support to marine research, outside of the monitoring required by their incidental take authorizations. They also develop approaches to ensure that these resources are minimally impacted by current and future Navy operations. Navy scientists work cooperatively with other government researchers and scientists, universities, industry, and non-governmental conservation organizations in collecting, evaluating, and modeling information on marine resources, including working towards a better understanding of marine mammals and sound. From 2004 to 2012, the Navy has provided over $230 million for marine species research. The Navy sponsors 70 percent of all U.S. research concerning the effects of human-generated sound on marine mammals and 50 percent of such research conducted worldwide. Major topics of Navy-supported marine species research directly applicable to proposed activities within the HSTT Study Area inclnde the following:

- Better understanding of marine species distribution and important habitat areas;
- Developing methods to detect and monitor marine species before and during training and testing activities;
- Better understanding the impacts of sound on marine mammals, sea turtles, fish, and birds; and
- Developing tools to model and estimate potential impacts of sound.

It is imperative that the Navy's research and development (R&D) efforts related to marine mammals are conducted in an open, transparent manner with validated study needs and requirements. The goal of the Navy's R&D program is to enable collection and publication of scientifically valid research as well as development of techniques and tools for Navy, academic, and commercial use. The two Navy organizations that account for most funding and oversight of the Navy marine mammal research program are the Office of Naval Research (ONR) Marine Mammals and Biology Program, and the Office of the Chief of Naval Operations (CNO) Energy and Environmental Readiness Division (N45) Living Marine Resources (LMR) Program. The primary focus of these programs has been on understanding the effects of sound on marine mammals, including physiological, behavioral and ecological effects.

The ONR Marine Mammals and Biology Program supports basic and applied research and technology development related to understanding the effects of sound on marine mammals, including physiological, behavioral, ecological, and population-level effects. Current program thrusts include, but are not limited to:

- Monitoring and detection;
- Integrated ecosystem research including sensor and tag development;
- Effects of sound on marine life including hearing, behavioral response studies, diving and stress physiology, and Population Consequences of Acoustic Disturbance (PCAD); and
- Models and databases for environmental compliance.

To manage some of the Navy's marine mammal research programmatic elements, OPNAV N45 developed in 2011 a new Living Marine Resources (LMR) Research and Development Program. The mission of the LMR program is to develop, demonstrate, and assess information and technology solutions to protect living marine resources by minimizing the environmental risks of Navy at-sea training and testing activities while preserving core Navy readiness capabilities. This mission is accomplished by:

- Improving knowledge of the status and trends of marine species of concern and the ecosystems of which they are a part;
- Developing the scientific basis for the criteria and thresholds to measure the effects of Navy generated sound;
- Improving understanding of underwater sound and sound field characterization unique to assessing the biological consequences resulting from nnderwater sound (as opposed to tactical applications of underwater sonnd or propagation loss modeling for military communications or tactical applications); and
- Developing technologies and methods to monitor and, where possible, mitigate biologically significant consequences to living marine resources resulting from naval activities, emphasizing those consequences that are most likely to be biologically significant.

The program is focused on three primary objectives that influence program management priorities and directly affect the program's success in accomplishing its mission:

1. Collect, Validate, and Rank R&D Needs: Expand awareness of R&D program opportunities within the Navy marine resource community to encourage and facilitate the submittal of well-defined and appropriate needs statements.

2. Address High Priority Needs: Ensure that program investments and the resnlting projects maintain a direct and consistent link to the defined user needs.

3. Transition Solutions and Validate Benefits: Maximize the number of program-derived solutions that are successfully transitioned to the Fleet and system commands.

APPENDIX C. CRITERIA AND THRESHOLDS FOR SONARS AND OTHER ACTIVE ACOUSTIC SOURCES

Table C-1. Navy criteria and thresholds for marine mammals and sea turtles exposed to sonars and other active acoustic sources

Functional Hearing Group or Species	PTS Threshold (all weighted SEL)	TTS Threshold (all weighted SEL)	Behavioral Threshold
LF Cetaceans	(Type II) SEL: 198 dB re 1 $\mu Pa^2 \cdot s$	(Type II) SEL: 178 dB re 1 $\mu Pa^2 \cdot s$	(Type I) SPL: BRF_1
MF Cetaceans (*except beaked whales*)	(Type II) SEL: 198 dB re 1 $\mu Pa^2 \cdot s$	(Type II) SEL: 178 dB re 1 $\mu Pa^2 \cdot s$	(Type I) SPL: BRF_2
Beaked whales	(Type II) SEL: 198 dB re 1 $\mu Pa^2 \cdot s$	(Type II) SEL: 178 dB re 1 $\mu Pa^2 \cdot s$	(unweighted) SPL: 140 dB re 1 µPa
HF Cetaceans (*except harbor porpoises*)	(Type II) SEL: 172 dB re 1 $\mu Pa^2 \cdot s$	(Type II) SEL: 152 dB re 1 $\mu Pa^2 \cdot s$	(Type I) SPL: BRF_2
Harbor porpoises	(Type II) SEL: 172 dB re 1 $\mu Pa^2 \cdot s$	(Type II) SEL: 152 dB re 1 $\mu Pa^2 \cdot s$	(unweighted) SPL: 120 dB re 1 µPa
Phocids Sirenians (in water)	(Type I) SEL: 197 dB re 1 $\mu Pa^2 \cdot s$	(Type I) SEL: 183 dB re 1 $\mu Pa^2 \cdot s$	(Type I) SPL: BRF_2
Phocids (in air)	(Type I) SEL: 145 dB re $(20\ \mu Pa)^2 \cdot s$	(Type I) SEL: 131 dB re $(20\ \mu Pa)^2 \cdot s$	(unweighted) SEL: 100 dB re $(20\ \mu Pa)^2 \cdot s$
Otariids Odobenids Mustelids Ursids (in water)	(Type I) SEL: 220 dB re 1 $\mu Pa^2 \cdot s$	(Type I) SEL: 206 dB re 1 $\mu Pa^2 \cdot s$	(Type I) SPL: BRF_2
Otariids Odobenids Mustelids Ursids (in air)	(Type I) SEL: 168 dB re $(20\ \mu Pa)^2 \cdot s$	(Type I) SEL: 154 dB re $(20\ \mu Pa)^2 \cdot s$	(unweighted) SEL: 100 dB re $(20\ \mu Pa)^2 \cdot s$
Sea Turtles	(Type I) SEL: 198 dB re 1 $\mu Pa^2 \cdot s$	(Type I) SEL: 178 dB re 1 $\mu Pa^2 \cdot s$	(Type I) SPL: 175 dB re 1 µPa

Exhibit 13
CD-008-13

Table 6-10: Non-Impulsive Range in 6-dB Bins and Percentage of Behavioral Harassments in Each Bin under Behavioral Risk Functions for Four Representative Sonar Systems

Received Level	Sonar Bin MF1 (e.g., SQS-53; ASW Hull Mounted Sonar)		Sonar Bin MF4 (e.g., AQS-22; ASW Dipping Sonar)		Sonar Bin MF5 (e.g., SSQ-62; ASW Sonobuoy)		Sonar Bin HF4 (e.g., SQQ-32; MIW Sonar)	
	Distance at Which Levels Occur Within Radius of Source (m)	Percentage of Behavioral Harassments Occurring at Given Levels	Distance at Which Levels Occur Within Radius of Source (m)	Percentage of Behavioral Harassments Occurring at Given Levels	Distance at Which Levels Occur Within Radius of Source (m)	Percentage of Behavioral Harassments Occurring at Given Levels	Distance at Which Levels Occur Within Radius of Source (m)	Percentage of Behavioral Harassments Occurring at Given Levels
Low Frequency Cetaceans								
120 ≤SPL <126	172,558 – 162,925	0.00%	40,000 – 40,000	0.00%	23,880 – 17,330	0.00%	3,100 – 2,683	0.00%
126 ≤SPL <132	162,925 – 117,783	0.00%	40,000 – 40,000	0.00%	17,330 – 12,255	0.10%	2,683 – 2,150	0.01%
132 ≤SPL <138	117,783 – 108,733	0.04%	40,000 – 12,975	3.03%	12,255 – 7,072	4.12%	2,150 – 1,600	0.48%
138 ≤SPL <144	108,733 – 77,850	1.57%	12,975 – 12,800	0.14%	7,072 – 3,297	23.69%	1,600 – 1,150	4.20%
144 ≤SPL <150	77,850 – 58,400	5.32%	12,800 – 6,525	27.86%	3,297 – 1,113	42.90%	1,150 - 575	24.79%
150 ≤SPL <156	58,400 – 53,942	4.70%	6,525 – 2,875	36.83%	1,113 - 255	24.45%	575 - 300	28.10%
156 ≤SPL <162	53,942 – 8,733	83.14%	2,875 – 1,088	23.78%	255 - 105	3.52%	300 - 150	24.66%
162 ≤SPL <168	8,733 – 4,308	3.51%	1,088 - 205	7.94%	105 - 55	1.08%	150 - 100	9.46%
168 ≤SPL <174	4,308 – 1,950	1.31%	205 - 105	0.32%	55 - 55	0.00%	100 - <50	8.30%
174 ≤SPL <180	1,950 - 850	0.33%	105 - 55	0.10%	55 - 55	0.00%	<50	0.00%
180 ≤SPL <186	850 - 400	0.06%	55 - <50	0.01%	55 - <50	0.13%	<50	0.00%
186 ≤SPL <192	400 - 200	0.01%	<50	0.00%	<50	0.00%	<50	0.00%
192 ≤ SPL <198	200 - 100	0.00%	<50	0.00%	<50	0.00%	<50	0.00%
Mid-Frequency Cetaceans								
120 ≤ SPL <126	172,592 – 162,933	0.00%	40,000 – 40,000	0.00%	24,205 – 18,872	0.00%	4,133 – 3,600	0.00%
126 ≤ SPL <132	162,933 – 124,867	0.00%	40,000 – 40,000	0.00%	18,872 – 12,697	0.10%	3,600 – 3,075	0.00%
132 ≤ SPL <138	124,867 – 108,742	0.07%	40,000 – 12,975	2.88%	12,697 – 7,605	3.03%	3,075 – 2,525	0.01%
138 ≤ SPL <144	108,742 – 78,433	1.54%	12,975 – 12,950	0.02%	7,605 – 4,080	17.79%	2,525 – 1,988	0.33%
144 ≤ SPL <150	78,433 – 58,650	5.41%	12,950 – 6,725	26.73%	4,080 – 1,383	46.83%	1,988 – 1,500	2.83%
150 ≤ SPL <156	58,650 – 53,950	4.94%	6,725 – 3,038	36.71%	1,383 - 300	27.08%	1,500 – 1,000	14.92%
156 ≤ SPL <162	53,950 – 8,925	82.62%	3,038 – 1,088	25.65%	300 - 155	3.06%	1,000 - 500	40.11%
162 ≤ SPL <168	8,925 – 4,375	3.66%	1,088 - 255	7.39%	155 - 55	2.02%	500 - 300	22.18%
168 ≤ SPL <174	4,375 – 1,992	1.34%	255 - 105	0.52%	55 - 55	0.00%	300 - 150	14.55%
174 ≤ SPL <180	1,992 - 858	0.34%	105 - 55	0.09%	55 - 55	0.00%	150 - <50	5.07%
180 ≤ SPL <186	858 - 408	0.06%	55 - <50	0.01%	55 - <50	0.09%	<50	0.00%
186 ≤ SPL <192	408 - 200	0.01%	<50	0.00%	<50	0.00%	<50	0.00%
192 ≤ SPL <198	200 - 100	0.00%	<50	0.00%	<50	0.00%	<50	0.00%

ASW: anti-submarine warfare; MIW: mine warfare; m: meter; SPL: sound pressure level

TIME-DELAYED UNDERWATER DETONATION CURRENT and SAME AS PROPOSED FOR HSTT

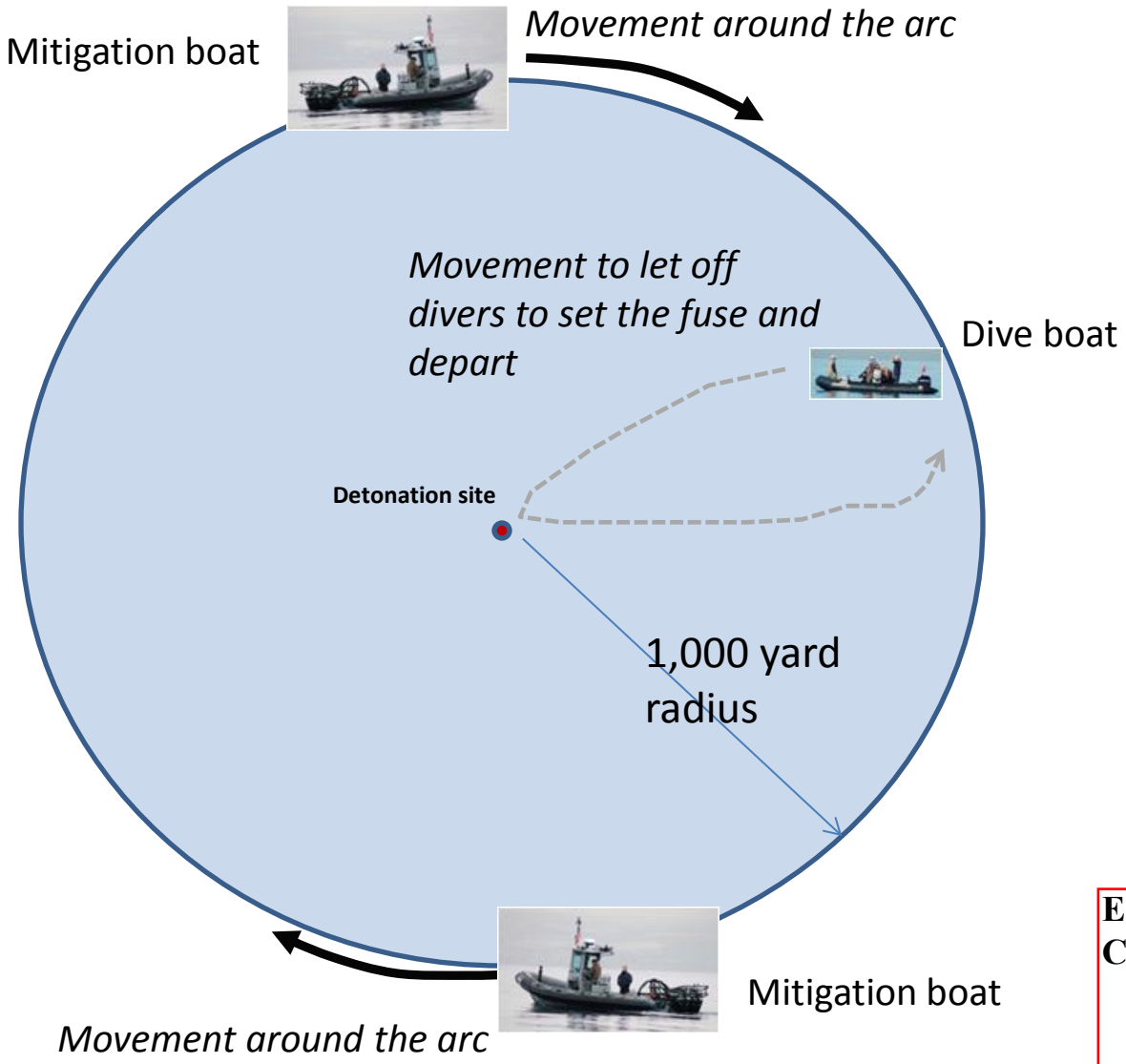


Exhibit 15
CD-008-13

TIME-DELAYED UNDERWATER DETONATION DISTANCES PROPOSED FOR HSTT

Distance for all charge weights would be **1000 yards** with two monitoring boats (assuming a maximum allowed 10-minute timed delay)

Other practical considerations:

•Mitigation boats accounts for effectiveness of using two boats stationed at opposite ends of the circle 1000 yards from a detonation site and moving. (A third dive boat while not part of the mitigation is used to carry the divers and boat driver(s) who can also watch for marine mammals and sea turtles)

• Zone of 1000 yards is larger than zone of any modeled underwater detonation explosive weight to account for sighting moving marine mammals further away from the charge prior to setting the fuse

• Navy needs to certify some teams to use time-delayed underwater detonation, but the majority of training detonations are still done using positive control as a diver safety feature during the training.

•Due to operational, training, and safety concerns, most underwater detonation events occur over the course of several hours for even a single detonation event. So there is ample time for situational awareness of any in-water marine species.

CURRENT TIME-DELAYED UNDERWATER DETONATION DISTANCES AS OF 24 JULY 2012

From Navy's 2011 addendum to the Silver Strand Training Complex LOA application:

"Table 11-3 shows the Navy's final mitigation zones and application for SSTC TDFD underwater detonations."

Table 11-3. Navy's mitigation zone radius for TDFDs within the Silver Strand Training Complex (SSTC) based on size of charge and length of time-delay

charge weight *	Time Delay					
	5 min	6 min	7 min	8 min	9 min	10 min
5 lb	1,000 yards	1,000 yards	1,000 yards	1,000 yards	1,400 yards	1,400 yards
10 lb	1,000 yards	1,000 yards	1,000 yards	1,000 yards	1,400 yards	1,400 yards
15-29 lb	1,000 yards	1,400 yards	1,400 yards	1,400 yards	1,500 yards	1,500 yards

Navy mitigation applied:
1,000 yd = minimum of 2 observation boats
1,400/1,500 yd = minimum of 3 observation boats or 2 boats and 1 helicopter

Mitigation authorized for SSTC by NMFS on 24 July 2012 (77FR43238)

UNDERWATER DETONATION DISTANCES IN MARCH 2011

- 700 yard mitigation zone
- Typical timed delayed used at in March was 15-minutes

fishermen perceived these methods as being effective. However, relocating to other fishing grounds in response to an existing or new area closure around SCI can significantly impact the fishermen's fishing success and operating costs. In general, the overwhelming concern of most commercial and CPFV fishermen regarding the impact of relocating their fishing grounds in the event of a Navy closure was the extra time and effort to move gear, loss of productive fishing areas, and extra costs, particularly in fuel consumption.

More than any other fishery sampled, spiny lobster fishermen did not have enough time to relocate and move their gear to accommodate a Navy clearance event. However, CPFVs were more likely to have sufficient warning to change their fishing destination in response to a Navy clearance event. Lastly, maintaining access to public anchorages around SCI, particularly Pyramid Cove and Northwest Harbor, is critical for the safety of the fishermen, as well as for ensuring that fishermen are not subjected to increased fuel costs as a result of relocation.

Future management concerns of the Navy and fishermen of SOCAL include the designation of MPAs in SOCAL. If MPAs are implemented in SOCAL, that do not include the waters immediately surrounding SCI, it can be anticipated that fishing activities will increase dramatically in this area. The Navy and the fishermen of SOCAL should continue to provide input in the MPA process to ensure their concerns are addressed.

4.2. RECOMMENDATIONS

This study provided the fishermen with a platform to offer recommendations to the Navy to improve communication between the Navy and the fishing community and closure notification methods. These suggestions will ultimately help the Navy identify the conflicts the fishermen perceive are occurring within the SOCAL Range Complex and allow the Navy to respond to the fishermen's concerns. The Navy will take under consideration and review the recommendations to see which can be implemented. The fishermen's responses revealed a number of recommendations that would benefit not only the fishermen, but also could benefit the Navy as it would limit potential military/civilian interactions and delays in Navy training activities, as well as improve the perception of the Navy by the fishing community in these shared waters.

Overall, fishermen agreed that a combination of regularly scheduled radio announcements, a clear and regularly updated website, and easily obtainable and reliable contact information with assured rapid response would serve to mitigate any conflicts between fishermen and the Navy within the SOCAL Range Complex. In addition, scheduling island-wide closures during times outside prime fishing seasons could minimize impacts on the fishing fleet. A summary of these recommendations, as well as suggestions for improvements for the study, and future socioeconomic fisheries studies within other Navy ranges in the U.S. that may face potential user-conflict issues are provided below.

Exhibit 16
CD-008-13

Surveyed Fishermen's Recommendations:

- Regular broadcasted announcements on VHF Channel 16 or the addition of a hotline number that is updated every four hours would reach a greater percentage of the fishing population and allow fishermen to plan their fishing trips in a manner that is more cost and time efficient and less intrusive to Navy training activities.

- More frequent updates to the SCI schedule of operations website would prevent unnecessary and costly trips for fishermen, as well as help the Navy to more easily acquire necessary clearance for the training operations. The addition of a legend for Navy abbreviations/nomenclature and activity types within the schedule of operations webpage would prevent confusion among users and would make it easier for first time users of the website to understand the schedule.

- The addition of a single POC at SCI Fleet Control that has the most updated schedule information for the SCI website would give fishermen who do not utilize the internet a reliable source to contact for regarding the schedule and associated closures.

- The addition of a cellular phone tower at the southern end of SCI would allow fishermen who do not have satellite phones to call SCI Security if they had questions regarding the schedule once they have left the mainland. This also would improve overall communication between the fishermen and SCI Security in the southern end of SCI.

- Not all Navy training activities occur in the waters surrounding SCI. Clarification of whether a Navy activity requires a closure to fishing grounds or if fishing is still permitted despite the operations would allow fishermen to fish in areas that they may perceive as closed when, in fact, they are open for use.

Future Study Recommendations:

- An increased sample size with equal representation of all the fisheries of interest would allow for a more comprehensive statistical analysis of the data. The nautical charts were essential in acquiring a spatial scale for the fishermen's common fishing grounds. However, adding a grid to the nautical charts which could then be ranked by the fishermen for importance would allow for more structured and comprehensive statistical analysis.

- Supplementing the data obtained in this study with other data types (i.e., actual fuel cost estimates, expense data, frequency of interruptions to Navy operations, frequency and type of Navy operations at SCI) would allow for a more comprehensive analysis for planning purposes.

- A parallel study on the east coast employing similar methods to the current study could increase the Navy's understanding of its interactions with resource users and address future Navy needs within other current and future ranges.

B. TRAINING AND TESTING ACTIVITIES MATRICES

Table B-1: Stressors by Training Activity

Hawaii-Southern California Training Activity	Biological Resources																Physical Resources						Human Resources							
	Acoustic Stressors							Energy Stressors		Physical Stressors				Entanglement Stressors		Ingestion Stressors	Air Quality Stressors		Sediment and Water Quality Stressors											
	Tactical Acoustic Sonar	Other Acoustic Devices	Underwater Explosions	In-air Explosions	Weapons Firing Noise	Aircraft Noise	Vessel and Simulated Vessel Noise	Electromagnetic Devices	Lasers	Aircraft and Aerial Target Strikes	Vessel and In-water Device Strikes	Military Expended Materials	Seafloor Devices	Fiber Optic Cables and Guidance Wires	Parachutes	Military Expended Materials	Criteria Air Pollutants	Hazardous Air Pollutants	Explosives	Metals	Chemicals	Other Materials	Acoustics [1,4]	Physical Disturbance [1]	Accessibility [2]	Airborne Acoustics [2]	Physical Disturbance and Strikes [2]	Underwater Energy [3]	In-Air Energy [3]	Physical Interactions [3]
ANTI-AIR WARFARE (AAW)																														
Air Combat Maneuver (ACM)						✓				✓						✓	✓	✓		✓		✓	✓			✓	✓			
Air Defense Exercise (ADEX)						✓	✓			✓	✓						✓	✓								✓	✓			
Gunnery Exercise (Air-to-Air)				✓	✓	✓				✓		✓				✓	✓	✓		✓				✓	✓	✓	✓			✓
Missile Exercise (Air-to-Air)				✓		✓				✓		✓			✓	✓	✓	✓	✓	✓	✓			✓	✓	✓	✓			✓
Gunnery Exercise (Surface-to-Air)				✓	✓	✓	✓			✓	✓	✓				✓	✓	✓	✓	✓				✓	✓	✓	✓			✓
Missile Exercise - Man-portable Air Defense System				✓		✓				✓		✓				✓	✓	✓	✓	✓	✓			✓	✓	✓	✓			✓
AMPHIBIOUS WARFARE (AMW)																														
Fire Support Exercise – Land-Based Target					✓	✓	✓				✓						✓	✓							✓	✓				✓
Amphibious Assault						✓	✓			✓	✓						✓	✓						✓	✓		✓			✓
Amphibious Assault – Battalion Landing							✓			✓	✓						✓	✓						✓	✓		✓			✓
Amphibious Raid						✓	✓				✓						✓	✓						✓	✓		✓			✓
Expeditionary Fires Exercise / Supporting Arms Coordination Exercise					✓	✓	✓				✓						✓	✓							✓	✓				✓
ANTI-SURFACE WARFARE (ASUW)																														
Maritime Security Operations						✓	✓			✓	✓	✓				✓	✓	✓							✓	✓	✓			✓
Gunnery Exercise (Surface-to-Surface) Ship – Small-Caliber							✓				✓	✓				✓	✓	✓		✓					✓	✓	✓			✓
Gunnery Exercise (Surface-to-Surface) Ship – Medium and Large Caliber			✓		✓		✓				✓	✓				✓	✓	✓	✓	✓			✓	✓	✓	✓	✓	✓		✓

Note: ** Proposed Action only. 1: cultural resources stressor; 2: socioeconomics stressor; 3: public health and safety stressor; 4: Acoustics Stressor includes only underwater explosives and airborne sonic booms

Exhibit 17
CD-008-13

Table B-1: Stressors by Training Activity (continued)

Hawaii-Southern California Training Activity	Biological Resources																Physical Resources						Human Resources							
	Acoustic Stressors							Energy Stressors		Physical Stressors				Entanglement Stressors		Ingestion Stressors	Air Quality Stressors		Sediment and Water Quality Stressors											
	Tactical Acoustic Sonar	Other Acoustic Devices	Underwater Explosions	In-air Explosions	Weapons Firing Noise	Aircraft Noise	Vessel and Simulated Vessel Noise	Electromagnetic Devices	Lasers	Aircraft and Aerial Target Strikes	Vessel and In-water Device Strikes	Military Expended Materials	Seafloor Devices	Fiber Optic Cables and Guidance Wires	Parachutes	Military Expended Materials	Criteria Air Pollutants	Hazardous Air Pollutants	Explosives	Metals	Chemicals	Other Materials	Acoustics [1,4]	Physical Disturbance [1]	Accessibility [2]	Airborne Acoustics [2]	Physical Disturbance and Strikes [2]	Underwater Energy [3]	In-Air Energy [3]	Physical Interactions [3]
ANTI-SURFACE WARFARE (ASUW)																														
Gunnery Exercise (Surface-to-Surface) Boat – Small-Caliber							✓				✓	✓				✓	✓	✓		✓				✓	✓	✓	✓	✓		✓
Gunnery Exercise (Surface-to-Surface) Boat – Medium-Caliber			✓		✓		✓				✓	✓				✓	✓	✓	✓	✓			✓	✓	✓	✓	✓	✓		✓
Missile Exercise (Surface-to-Surface)			✓		✓		✓				✓	✓				✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓		✓
Gunnery Exercise (Air-to-Surface) – Small-Caliber						✓				✓		✓				✓	✓	✓		✓				✓	✓	✓	✓			✓
Gunnery Exercise (Air-to-Surface) – Medium-Caliber			✓			✓				✓	✓	✓				✓	✓	✓	✓	✓			✓	✓	✓	✓	✓	✓		✓
Missile Exercise (Air-to-Surface) Rocket			✓			✓				✓	✓	✓				✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓
Missile Exercise (Air-to-Surface)			✓			✓				✓	✓	✓		✓		✓	✓	✓	✓	✓	✓		✓	✓	✓		✓	✓	✓	✓
Bombing Exercise (Air-to-Surface)			✓			✓				✓		✓				✓	✓	✓	✓	✓			✓	✓	✓		✓	✓	✓	✓
Laser Targeting						✓	✓		✓	✓	✓						✓	✓							✓		✓		✓	✓
Sinking Exercise (SINKEX)			✓		✓	✓	✓		✓	✓	✓	✓		✓		✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓		✓
ANTI-SUBMARINE WARFARE (ASW)																														
Tracking Exercise/Torpedo Exercise – Submarine	✓						✓			✓	✓	✓		✓						✓				✓			✓	✓		✓
Tracking Exercise/Torpedo Exercise – Surface	✓						✓				✓	✓					✓	✓						✓	✓		✓	✓		✓
Tracking Exercise/Torpedo Exercise – Helicopter	✓					✓	✓			✓	✓	✓			✓	✓	✓	✓		✓	✓	✓		✓	✓	✓	✓	✓		✓
Tracking Exercise/Torpedo Exercise – Maritime Patrol Aircraft	✓					✓	✓			✓	✓	✓			✓	✓	✓	✓		✓	✓	✓		✓	✓	✓	✓	✓		✓
Tracking Exercise/Torpedo Exercise – Maritime Patrol Aircraft Extended Echo Ranging Sonobuoys	✓		✓			✓				✓		✓			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓
KILO Dip - Helicopter	✓					✓				✓							✓	✓	✓					✓	✓	✓	✓	✓		✓

Notes: 1: cultural resources stressor; 2: socioeconomics stressor; 3: public health and safety stressor; 4: Acoustics Stressor includes only underwater explosives and airborne sonic booms

Table B-1: Stressors by Training Activity (continued)

Hawaii-Southern California Training Activity	Biological Resources															Physical Resources						Human Resources							
	Acoustic Stressors							Energy Stressors		Physical Stressors				Entanglement Stressors		Ingestion Stressors	Air Quality Stressors		Sediment and Water Quality Stressors										
	Tactical Acoustic Sonar	Other Acoustic Devices	Underwater Explosions	In-air Explosions	Weapons Firing Noise	Aircraft Noise	Vessel and Simulated Vessel Noise	Electromagnetic Devices	Lasers	Aircraft and Aerial Target Strikes	Vessel and In-water Device Strikes	Military Expended Materials	Seafloor Devices	Fiber Optic Cables and Guidance Wires	Parachutes	Military Expended Materials	Criteria Air Pollutants	Hazardous Air Pollutants	Explosives	Metals	Chemicals	Other Materials	Acoustics [1, 4]	Physical Disturbance [1]	Accessibility [2]	Airborne Acoustics [2]	Physical Disturbance and Strikes [2]	Underwater Energy [3]	In-Air Energy [3]	Physical Interactions [3]
MAJOR TRAINING EVENTS																													
ASW for Composite Training Unit Exercise (COMPTUEX)	✓	✓	✓			✓	✓			✓	✓	✓			✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓		✓
ASW for Joint Task Force Exercise (JTFEX)/Sustainment Exercise (SUSTAINEX)	✓	✓	✓			✓	✓			✓	✓	✓			✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓		✓
Integrated Anti-Submarine Warfare Course (IAC)	✓	✓				✓	✓			✓	✓	✓			✓	✓	✓	✓		✓	✓			✓	✓	✓	✓	✓		✓
Group Sail	✓	✓	✓			✓	✓			✓	✓	✓			✓		✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓		✓
ELECTRONIC WARFARE (EW)																													
Electronic Warfare Operations (EW Ops)						✓	✓			✓	✓						✓	✓							✓	✓	✓			✓
Counter Targeting Flare Exercise						✓				✓						✓	✓	✓		✓		✓		✓	✓	✓	✓			✓
Counter Targeting Chaff Exercise – Ship							✓				✓					✓	✓	✓				✓			✓					✓
Counter Targeting Chaff Exercise – Aircraft						✓				✓						✓	✓	✓				✓				✓				✓
MINE WARFARE (MIW)																													
Mine Countermeasure Exercise (MCM) – Ship Sonar	✓						✓				✓		✓				✓	✓							✓			✓		✓
Mine Countermeasure Exercise – Surface (SMCMEX)	✓						✓				✓		✓				✓	✓							✓			✓		✓
Mine Neutralization – Explosive Ordnance Disposal (EOD)			✓			✓	✓			✓	✓	✓	✓			✓	✓	✓	✓				✓	✓	✓	✓	✓	✓		✓
Mine Countermeasure (MCM) – Towed Mine Neutralization						✓	✓	✓		✓	✓		✓				✓	✓						✓	✓	✓	✓	✓		✓
Mine Countermeasure (MCM) – Mine Detection	✓					✓	✓			✓	✓		✓				✓	✓						✓	✓	✓	✓	✓	✓	✓
Mine Countermeasure (MCM) – Mine Neutralization					✓	✓	✓			✓	✓	✓	✓			✓	✓	✓		✓				✓	✓	✓	✓		✓	✓
Mine Neutralization – Remotely Operated Vehicle			✓			✓	✓			✓	✓	✓	✓	✓		✓	✓	✓	✓	✓			✓	✓	✓	✓	✓	✓		✓

Notes: ** Proposed Action only. 1: cultural resources stressor; 2: socioeconomics stressor; 3: public health and safety stressor; 4: Acoustics Stressor includes only underwater explosives and airborne sonic booms

Table B-1: Stressors by Training Activity (continued)

Hawaii-Southern California Training Activity	Biological Resources																Physical Resources						Human Resources							
	Acoustic Stressors							Energy Stressors		Physical Stressors				Entanglement Stressors		Ingestion Stressors	Air Quality Stressors		Sediment and Water Quality Stressors											
	Tactical Acoustic Sonar	Other Acoustic Devices	Underwater Explosions	In-air Explosions	Weapons Firing Noise	Aircraft Noise	Vessel and Simulated Vessel Noise	Electromagnetic Devices	Lasers	Aircraft and Aerial Target Strikes	Vessel and In-water Device Strikes	Military Expended Materials	Seafloor Devices	Fiber Optic Cables and Guidance Wires	Parachutes	Military Expended Materials	Criteria Air Pollutants	Hazardous Air Pollutants	Explosives	Metals	Chemicals	Other Materials	Acoustics [1, 4]	Physical Disturbance [1]	Accessibility [2]	Airborne Acoustics [2]	Physical Disturbance and Strikes [2]	Underwater Energy [3]	In-Air Energy [3]	Physical Interactions [3]
MINE WARFARE (MIW)																														
Mine Laying**						✓				✓		✓					✓	✓		✓				✓	✓	✓	✓			✓
Marine Mammal System			✓														✓	✓	✓	✓				✓	✓	✓	✓	✓		✓
Shock Wave Generator			✓													✓				✓				✓	✓	✓	✓	✓		✓
Surf Zone Test Detachment/ Equipment Test and Evaluation			✓																									✓		
Submarine Mine Exercise											✓	✓	✓															✓		✓
Maritime Homeland Defense/Security Mine Countermeasures	✓		✓			✓	✓	✓		✓	✓		✓				✓	✓	✓				✓	✓	✓	✓	✓	✓		✓
NAVAL SPECIAL WARFARE (NSW)																														
Personnel Insertion/ Extraction - Submarine											✓																			
Personnel Insertion/ Extraction – Non-submarine						✓				✓							✓	✓	✓											
Underwater Demo Multiple Charge – Mat Weave & Obstacle Loading			✓									✓	✓			✓	✓	✓	✓				✓	✓	✓	✓	✓	✓		✓
Underwater Demolition Qualification / Certification			✓									✓	✓			✓	✓	✓	✓				✓	✓	✓	✓	✓	✓		✓

Notes: ** Proposed Action only. 1: cultural resources stressor; 2: socioeconomics stressor; 3: public health and safety stressor; 4: Acoustics Stressor includes only underwater explosives and airborne sonic booms

Table B-1: Stressors by Training Activity (continued)

Hawaii-Southern California Training Activity	Biological Resources															Physical Resources						Human Resources							
	Acoustic Stressors							Energy Stressors		Physical Stressors				Entanglement Stressors		Ingestion Stressors	Air Quality Stressors		Sediment and Water Quality Stressors										
	Tactical Acoustic Sonar	Other Acoustic Devices	Underwater Explosions	In-air Explosions	Weapons Firing Noise	Aircraft Noise	Vessel and Simulated Vessel Noise	Electromagnetic Devices	Lasers	Aircraft and Aerial Target Strikes	Vessel and In-water Device Strikes	Military Expended Materials	Seafloor Devices	Fiber Optic Cables and Guidance Wires	Parachutes	Military Expended Materials	Criteria Air Pollutants	Hazardous Air Pollutants	Explosives	Metals	Chemicals	Other Materials	Acoustics [1, 4]	Physical Disturbance [1]	Accessibility [2]	Airborne Acoustics [2]	Physical Disturbance and Strikes [2]	Underwater Energy [3]	In-Air Energy [3]	Physical Interactions [3]
OTHER TRAINING EXERCISES																													
Precision Anchoring							✓				✓		✓				✓	✓			✓	✓		✓	✓		✓		✓
Small Boat Attack					✓		✓				✓					✓	✓	✓		✓									
Offshore Petroleum Discharge System (OPDS)																	✓	✓											
Elevated Causeway System (ELCAS)		✓																							✓			✓	
Submarine Navigation	✓										✓																✓	✓		✓
Submarine Under Ice Certification	✓										✓													✓			✓	✓		✓
Surface Ship Sonar Maintenance	✓						✓				✓																	✓		
Submarine Sonar Maintenance	✓										✓																	✓		

Notes: ** Proposed Action only. 1: cultural resources stressor; 2: socioeconomics stressor; 3: public health and safety stressor; 4: Acoustics Stressor includes only underwater explosives and airborne sonic booms

Table B-2: Stressors by Testing Activity

Hawaii-Southern California Testing Activity	Biological Resources																Physical Resources						Human Resources							
	Acoustic Stressors							Energy Stressors		Physical Stressors				Entanglement Stressors		Ingestion Stressors	Air Quality Stressors		Sediment and Water Quality Stressors											
	Tactical Acoustic Sonar	Other Acoustic Devices	Underwater Explosions	In-air Explosions	Weapons Firing Noise	Aircraft Noise	Vessel and Simulated Vessel Noise	Electromagnetic Devices	Lasers	Aircraft and Aerial Target Strikes	Vessel and In-water Device Strikes	Military Expended Materials	Seafloor Devices	Fiber Optic Cables and Guidance Wires	Parachutes	Military Expended Materials	Criteria Air Pollutants	Hazardous Air Pollutants	Explosives	Metals	Chemicals	Other Materials	Acoustics [1, 4]	Physical Disturbance [1]	Accessibility [2]	Airborne Acoustics [2]	Physical Disturbance and Strikes [2]	Underwater Energy [3]	In-Air Energy [3]	Physical Interactions [3]
Naval Air Systems Command																														
ANTI-AIR WARFARE (AAW)																														
Air Combat Maneuver (ACM)						✓				✓							✓	✓								✓	✓			✓
Air Platform/Vehicle Test						✓				✓		✓					✓	✓		✓						✓	✓		✓	✓
Air Platform Weapons Integration Test						✓				✓		✓				✓	✓	✓	✓	✓					✓	✓	✓			✓
Intelligence, Surveillance, and Reconnaissance Test						✓				✓							✓	✓								✓	✓			✓
ANTI-SURFACE WARFARE (ASUW)																														
Air-to-Surface Missile Test			✓			✓				✓		✓				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓
Air-to-Surface Gunnery Test			✓			✓				✓		✓				✓	✓	✓	✓	✓			✓	✓	✓	✓	✓	✓		✓
Rocket Test			✓			✓				✓		✓				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Laser Targeting Test						✓				✓							✓	✓								✓	✓		✓	✓
ELECTRONIC WARFARE (EW)																														
Electronic System Evaluation						✓				✓							✓	✓								✓	✓			✓
ANTI-SUBMARINE WARFARE (ASW)																														
Anti-Submarine Warfare Torpedo Test	✓					✓				✓	✓	✓		✓	✓	✓	✓	✓		✓	✓	✓		✓	✓	✓	✓	✓		✓
Kilo Dip	✓					✓				✓							✓	✓							✓	✓	✓	✓		✓
Sonobuoy Lot Acceptance Test**	✓		✓			✓	✓			✓	✓	✓			✓	✓	✓	✓	✓				✓	✓	✓	✓	✓	✓		✓
Anti-Submarine Warfare Tracking Test – Helicopter	✓		✓			✓				✓		✓			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓
Anti-Submarine Warfare Tracking Test – Maritime Patrol Aircraft	✓		✓			✓				✓	✓	✓			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓

Notes:; 1: cultural resources stressor; 2: socioeconomics stressor; 3: public health and safety stressor; 4: Acoustics Stressor includes only underwater explosives and airborne sonic booms

Table B-2: Stressors by Testing Activity (continued)

Hawaii-Southern California Testing Activity	Biological Resources															Physical Resources						Human Resources							
	Acoustic Stressors							Energy Stressors		Physical Stressors				Entanglement Stressors		Ingestion Stressors	Air Quality Stressors		Sediment and Water Quality Stressors										
	Tactical Acoustic Sonar	Other Acoustic Devices	Underwater Explosions	In-air Explosions	Weapons Firing Noise	Aircraft Noise	Vessel and Simulated Vessel Noise	Electromagnetic Devices	Lasers	Aircraft and Aerial Target Strikes	Vessel and In-water Device Strikes	Military Expended Materials	Seafloor Devices	Fiber Optic Cables and Guidance Wires	Parachutes	Military Expended Materials	Criteria Air Pollutants	Hazardous Air Pollutants	Explosives	Metals	Chemicals	Other Materials	Acoustics [1, 4]	Physical Disturbance [1]	Accessibility [2]	Airborne Acoustics [2]	Physical Disturbance and Strikes [2]	Underwater Energy [3]	In-Air Energy [3]	Physical Interactions [3]
MINE WARFARE (MIW)																													
Airborne Mine Neutralization Systems Test (AMNS)			✓			✓				✓		✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Airborne Towed Minehunting Sonar System Test	✓					✓				✓	✓						✓	✓							✓	✓	✓	✓		✓
Airborne Towed Minesweeping System Test			✓			✓		✓		✓	✓		✓			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓
Airborne Laser-Based Mine Detection System Test – ALMDS						✓				✓							✓	✓							✓	✓	✓		✓	✓
Airborne Projectile-based Mine Clearance System Test			✓			✓				✓		✓	✓			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
OTHER TESTING ACTIVITIES																														
Test and Evaluation Catapult Launch						✓	✓			✓	✓						✓	✓							✓	✓	✓			✓
Air Platform Shipboard Integrate Test						✓				✓							✓	✓							✓	✓	✓			✓
Shipboard Electronic Systems Evaluation						✓				✓							✓	✓								✓	✓			✓
NAVAL SEA SYSTEMS COMMAND																														
NEW SHIP CONSTRUCTION																														
Surface Combatant Sea Trials – Pierside Sonar Testing**	✓	✓																										✓		
Surface Combatant Sea Trials – Propulsion Testing							✓				✓						✓	✓							✓		✓			✓
Surface Combatant Sea Trials – Gun Testing, Large-Caliber					✓		✓				✓	✓					✓	✓		✓				✓	✓	✓	✓			✓
Surface Combatant Sea Trials – Missile Testing					✓	✓	✓			✓	✓	✓					✓	✓		✓				✓	✓		✓			✓
Surface Combatant Sea Trials – Decoy Testing							✓				✓					✓	✓	✓				✓			✓		✓			✓
Surface Combatant Sea Trials – Surface Warfare Testing- Large-Caliber					✓		✓				✓	✓					✓	✓		✓				✓	✓	✓	✓			✓

Notes: ** Proposed Action only. 1: cultural resources stressor; 2: socioeconomics stressor; 3: public health and safety stressor; 4: Acoustics Stressor includes only underwater explosives and airborne sonic booms

Table B-2: Stressors by Testing Activity (continued)

Hawaii-Southern California Testing Activity	Biological Resources															Physical Resources						Human Resources							
	Acoustic Stressors							Energy Stressors		Physical Stressors				Entanglement Stressors		Ingestion Stressors	Air Quality Stressors		Sediment and Water Quality Stressors										
	Tactical Acoustic Sonar	Other Acoustic Devices	Underwater Explosions	In-air Explosions	Weapons Firing Noise	Aircraft Noise	Vessel and Simulated Vessel Noise	Electromagnetic Devices	Lasers	Aircraft and Aerial Target Strikes	Vessel and In-water Device Strikes	Military Expended Materials	Seafloor Devices	Fiber Optic Cables and Guidance Wires	Parachutes	Military Expended Materials	Criteria Air Pollutants	Hazardous Air Pollutants	Explosives	Metals	Chemicals	Other Materials	Acoustics [1,4]	Physical Disturbance [1]	Accessibility [2]	Airborne Acoustics [2]	Physical Disturbance and Strikes [2]	Underwater Energy [3]	In-Air Energy [3]	Physical Interactions [3]
NEW SHIP CONSTRUCTION (Continued)																													
Surface Combatant Sea Trials – Anti-Submarine Warfare Testing	✓	✓					✓				✓						✓	✓		✓	✓	✓			✓		✓	✓		✓
Other Class Ship Class Sea Trials – Propulsion Testing							✓				✓						✓	✓							✓		✓			✓
Other Class Ship Class Sea Trials – Gun Testing – Small-Caliber							✓				✓	✓				✓	✓	✓							✓	✓	✓			✓
ASW Mission Package Testing	✓					✓	✓			✓	✓	✓			✓	✓	✓	✓		✓	✓	✓		✓	✓	✓	✓	✓		✓
ASUW Mission Package Testing – Gun Testing-Small Caliber					✓		✓				✓	✓				✓	✓	✓		✓				✓	✓	✓	✓			✓
ASUW Mission Package Testing – Gun Testing-Medium Caliber					✓		✓				✓	✓					✓	✓		✓				✓	✓	✓	✓			✓
ASUW Mission Package Testing – Gun Testing-Large Caliber			✓	✓	✓		✓				✓	✓				✓	✓	✓	✓	✓	✓			✓	✓	✓	✓			✓
ASUW Mission Package Testing – Missile/Rocket Testing			✓		✓	✓	✓			✓	✓	✓				✓	✓	✓					✓	✓	✓	✓	✓	✓		✓
MCM Mission Package Testing**	✓		✓			✓	✓			✓	✓					✓	✓	✓		✓			✓	✓	✓	✓	✓	✓	✓	✓
Post-Homeporting Testing (All Classes)**							✓				✓						✓	✓							✓		✓			✓
LIFECYCLE ACTIVITIES																													
Ship Signature Testing**							✓				✓						✓	✓									✓	✓		✓
Surface Ship Sonar Testing/Maintenance (in OPAREAs and Ports)**	✓	✓					✓				✓						✓	✓									✓	✓		✓
Submarine Sonar Testing/Maintenance (in OPAREAs and Ports)**	✓	✓									✓																✓	✓		✓
Combat System Ship Qualification Trial (CSSQT) – In-port Maintenance Period**	✓																											✓		
Combat System Ship Qualification Trial (CSSQT) – Air Defense**				✓	✓	✓	✓			✓	✓	✓				✓	✓	✓		✓		✓		✓		✓	✓			✓
Combat System Ship Qualification Trial (CSSQT) – Anti-Surface Warfare**				✓	✓		✓				✓	✓				✓	✓	✓		✓		✓		✓		✓	✓			✓
Combat System Ship Qualification Trial (CSSQT) – Anti-Submarine Warfare**	✓					✓	✓			✓	✓	✓			✓	✓	✓	✓		✓		✓		✓		✓	✓	✓		✓

Notes: ** Proposed Action only. 1: cultural resources stressor; 2: socioeconomics stressor; 3: public health and safety stressor; 4: Acoustics Stressor includes only underwater explosives and airborne sonic booms

Table B-2: Stressors by Testing Activity (continued)

Hawaii-Southern California Testing Activity	Biological Resources															Physical Resources						Human Resources							
	Acoustic Stressors							Energy Stressors		Physical Stressors				Entanglement Stressors		Ingestion Stressors	Air Quality Stressors		Sediment and Water Quality Stressors										
	Tactical Acoustic Sonar	Other Acoustic Devices	Underwater Explosions	In-air Explosions	Weapons Firing Noise	Aircraft Noise	Vessel and Simulated Vessel Noise	Electromagnetic Devices	Lasers	Aircraft and Aerial Target Strikes	Vessel and In-water Device Strikes	Military Expended Materials	Seafloor Devices	Fiber Optic Cables and Guidance Wires	Parachutes	Military Expended Materials	Criteria Air Pollutants	Hazardous Air Pollutants	Explosives	Metals	Chemicals	Other Materials	Acoustics [1,4]	Physical Disturbance [1]	Accessibility [2]	Airborne Acoustics [2]	Physical Disturbance and Strikes [2]	Underwater Energy [3]	In-Air Energy [3]	Physical Interactions [3]
ANTI-SURFACE WARFARE/ANTI-SUBMARINE WARFARE TESTING																													
Missile Testing**					✓		✓			✓	✓	✓					✓	✓	✓	✓	✓			✓	✓	✓	✓			✓
Kinetic Energy Weapon Testing					✓		✓			✓	✓	✓								✓				✓	✓	✓	✓			✓
Electronic Warfare Testing**											✓																✓			✓
Torpedo (Non-explosive) Testing	✓	✓				✓	✓			✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓		✓
Torpedo (Explosive) Testing	✓		✓			✓	✓			✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓
Countermeasure Testing	✓	✓					✓				✓						✓	✓						✓			✓	✓		✓
Pierside Sonar Testing**	✓																											✓		
At-sea Sonar Testing**	✓	✓					✓				✓	✓					✓	✓									✓	✓		✓
MINE WARFARE TESTING																														
Mine Detection and Classification Testing**	✓					✓	✓			✓	✓						✓	✓							✓	✓	✓	✓		✓
Mine Countermeasure/Neutralization Testing**	✓		✓			✓	✓	✓		✓	✓			✓		✓	✓	✓	✓	✓		✓	✓		✓	✓	✓	✓		✓
Pierside Systems Health Checks**	✓	✓																												
SHIPBOARD PROTECTION SYSTEMS AND SWIMMER DEFENSE TESTING																														
Pierside Integrated Swimmer Defense	✓	✓				✓					✓		✓											✓			✓	✓		✓
Shipboard Protection Systems Testing**							✓				✓	✓				✓	✓	✓		✓						✓	✓	✓		✓
Chemical/Biological Simulant Testing**						✓	✓			✓	✓						✓	✓			✓	✓			✓	✓	✓			✓

Notes: 1: cultural resources stressor; 2: socioeconomics stressor; 3: public health and safety stressor; 4: Acoustics Stressor includes only underwater explosives and airborne sonic booms

Table B-2: Stressors by Testing Activity (continued)

Hawaii-Southern California Testing Activity	Biological Resources															Physical Resources						Human Resources							
	Acoustic Stressors							Energy Stressors		Physical Stressors				Entanglement Stressors		Ingestion Stressors	Air Quality Stressors		Sediment and Water Quality Stressors										
	Tactical Acoustic Sonar	Other Acoustic Devices	Underwater Explosions	In-air Explosions	Weapons Firing Noise	Aircraft Noise	Vessel and Simulated Vessel Noise	Electromagnetic Devices	Lasers	Aircraft and Aerial Target Strikes	Vessel and In-water Device Strikes	Military Expended Materials	Seafloor Devices	Fiber Optic Cables and Guidance Wires	Parachutes	Military Expended Materials	Criteria Air Pollutants	Hazardous Air Pollutants	Explosives	Metals	Chemicals	Other Materials	Acoustics [1,4]	Physical Disturbance [1]	Accessibility [2]	Airborne Acoustics [2]	Physical Disturbance and Strikes [2]	Underwater Energy [3]	In-Air Energy [3]	Physical Interactions [3]
UNMANNED VEHICLE TESTING																													
Underwater Deployed Unmanned Aerial System Testing**						✓				✓	✓	✓								✓				✓	✓		✓			✓
Unmanned Vehicle Development and Payload Testing**	✓					✓	✓				✓		✓											✓	✓		✓	✓		✓
OTHER TESTING																														
Special Warfare	✓	✓					✓				✓																✓	✓		✓
Acoustic Communications Testing**							✓				✓																✓			✓
SPACE AND NAVAL WARFARE SYSTEMS COMMAND																														
Autonomous Undersea Vehicle (AUV) Anti-Terrorism/Force Protection (AT/FP) Mine Countermeasures		✓									✓																			
AUV Underwater Communications		✓									✓																			
Fixed System Underwater Communications		✓							✓		✓		✓	✓																
AUV Autonomous Oceanographic Research and Meteorology and Oceanography (METOC)		✓																												
Fixed Autonomous Oceanographic Research and METOC		✓											✓																	
Passive Mobile Intelligence, Surveillance, and Reconnaissance Sensor Systems		✓					✓				✓																			
Fixed Intelligence, Surveillance, and Reconnaissance Sensor Systems		✓					✓				✓		✓	✓																
Anti-Terrorism/Force Protection (AT/FP) Fixed Sensor Systems		✓																												

Notes: ** Proposed Action only; 1: cultural resources stressor; 2: socioeconomics stressor; 3: public health and safety stressor; 4: Acoustics Stressor includes only underwater explosives and airborne sonic booms

Table B-3: Stressors by Resource

Stressors vs. Resources		Biological Resources															Physical Resources						Human Resources							
		Acoustic Stressors							Energy Stressors		Physical Stressors				Entanglement Stressors		Ingestion Stressors	Air Quality Stressors		Sediment and Water Quality Stressors											
		Tactical Acoustic Sonar	Other Acoustic Devices	Underwater Explosions	In-air Explosions	Weapons Firing Noise	Aircraft Noise	Vessel and Simulated Vessel Noise	Electromagnetic Devices	Lasers	Aircraft and Aerial Target Strikes	Vessel and In-water Device Strikes	Military Expended Materials	Seafloor Devices	Fiber Optic Cables and Guidance Wires	Parachutes	Military Expended Materials	Criteria Air Pollutants	Hazardous Air Pollutants	Explosives and Explosive Byproducts	Metals	Chemicals Other than Explosives	Other Materials	Acoustics [1, 4]	Physical Disturbance	Accessibility	Airborne Acoustics	Physical Disturbance and Strikes	Underwater Energy	In-Air Energy	Physical Interactions
Physical	Sediments and Water Quality																			✓	✓	✓	✓								
	Air Quality																	✓	✓												
Biological	Marine Habitats			✓								✓	✓	✓																	
	Marine Mammals	✓	✓	✓		✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓			✓	✓	✓	✓								
	Sea Turtles	✓	✓	✓		✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓			✓	✓	✓	✓								
	Birds	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓				✓	✓	✓												
	Marine Vegetation			✓								✓	✓	✓						✓	✓	✓	✓								
	Marine Invertebrates	✓	✓	✓					✓	✓		✓	✓	✓	✓	✓	✓			✓	✓	✓	✓								
	Fish	✓	✓	✓		✓		✓	✓	✓		✓	✓	✓	✓	✓	✓			✓	✓	✓	✓								
Human	Cultural Resources			✓			✓						✓	✓										✓	✓						
	Socioeconomic Resources		✓	✓	✓	✓	✓	✓				✓	✓		✓	✓				✓	✓	✓	✓			✓	✓	✓			
	Public Health and Safety	✓	✓	✓	✓	✓				✓	✓	✓	✓																✓	✓	✓

Table A-1: Baseline and Proposed Training Activities

Range Activity	Description of Activity	Distribution		Baseline			Proposed Action		
		In CZ?	Discussion	No. of events (per year)	Ordnance (Number per year)	Location	No. of events (per year)	Ordnance (Number per year)	Location
Anti-Air Warfare									
Air Combat Maneuver	Aircrews engage in flight maneuvers designed to gain a tactical advantage during combat.	No	> 12 nm from coast	3,970	None	SOCAL: Warning Area 291 (TMAs)	3,970	None	SOCAL: Warning Area 291 (TMAs)
Air Defense Exercise	Aircrew and ship crews conduct defensive measures against threat aircraft or missiles.	No	> 12 nm from coast	550	None	SOCAL: Warning Area 291	550	None	SOCAL: Warning Area 291
Gunnery Exercise (Air-to-Air) – medium-caliber	Aircrews defend against threat aircraft with cannons (machine gun).	No	> 12 nm from coast	N/A	N/A	N/A	3	3,000 rounds	SOCAL: Warning Area 291
Missile Exercise (Air-to-Air)	Aircrews defend against threat aircraft with missiles.	No	> 12 nm from coast	13	52 missiles (26 HE)	SOCAL: Warning Area 291,SOAR, FLETA Hot, MISRs	25	52 missiles (26 HE)	SOCAL: Warning Area 291, SOAR, FLETA Hot, MISRs
Gunnery Exercise (Surface-to-Air) – Large-caliber	Surface ship crews defend against threat aircraft or missiles with guns.	No	> 12 nm from shore	160	1,900 rounds	SOCAL: Warning Area 291	160	1,300 rounds	SOCAL: Warning Area 291
Gunnery Exercise (Surface-to-Air) – Medium-caliber	Surface ship crews defend against threat aircraft or missiles with guns.	No	> 12 nm from shore	190	266,000 rounds	SOCAL: Warning Area 291	190	380,000 rounds	SOCAL: Warning Area 291

Notes: N/A = Not Analyzed. This event was not analyzed as part of the baseline. SOCAL=Southern California [Range Complex]; TMA=Tactical Maneuvering Area; HE=High Explosive; SOAR=Southern California Anti-submarine Warfare Range; FLETA=Fleet Training Area; MISR=Missile Range.

Exhibit 18
CD-008-13

Table A-1: Baseline and Proposed Training Activities (continued)

Range Activity	Description of Activity	Distribution		Baseline			Proposed Action		
		In CZ?	Discussion	No. of events (per year)	Ordnance (Number per year)	Location	No. of events (per year)	Ordnance (Number per year)	Location
Anti-Air Warfare (continued)									
Missile Exercise-Man-portable Air Defense System	Marines employ the man-portable air defense systems, a shoulder fired surface to air missile, against threat missiles or aircraft.	No	>12 nm from shore	6	6 HE missiles	SOCAL: Warning Area 291	20	20 HE missiles	SOCAL: Warning Area 291
		Yes	Fired from SCI	4	68 HE missiles	SOCAL: SHOBA	4	68 HE missiles	SOCAL: SHOBA
Fire Support Exercise-Land-based target	Surface ship crews use large-caliber guns to fire on land-based targets in support of forces ashore.	Yes	Mostly nearshore but some open ocean	52	8,500 rounds (all rounds land ashore)	SOCAL: SHOBA	52	8,500 rounds (all rounds land ashore)	SOCAL: SHOBA
Amphibious Warfare (AMW)									
Amphibious Assault	Forces move ashore from ships at sea for the immediate execution of inland objectives.	Yes	Mostly nearshore but some open ocean	18	None	SSTC Boat Lanes 11-14	18	None	SSTC Boat Lanes 11-14
Amphibious Assault – Battalion Landing	Similar to amphibious assault, but with a much larger force and of longer duration.	Yes	Mostly nearshore but some open ocean	2	None	SOCAL: SHOBA, SWTR Nearshore, Eel Cove, West Cove, Wilson Cove	2	None	SOCAL: SHOBA, SWTR Nearshore, Eel Cove, West Cove, Wilson Cove

Notes: SOCAL=Southern California [Range Complex]; HE=High Explosive; SHOBA=Shore Bombardment Area; SSTC = Silver Strand Training Complex; SWTR=Shallow Water Training Range.

Table A-1: Baseline and Proposed Training Activities (continued)

Range Activity	Description of Activity	Distribution		Baseline			Proposed Action		
		In CZ?	Discussion	No. of events (per year)	Ordnance (Number per year)	Location	No. of events (per year)	Ordnance (Number per year)	Location
Amphibious Warfare (AMW) (continued)									
Amphibious Raid	Small unit forces move swiftly from ships at sea for a specific short-term mission. Raids are quick operations with as few Marines as possible.	Yes	Mostly nearshore but some open ocean	2,342	None	SOCAL: West, Cove, Horse Beach Cove, NW Harbor, CPAAA	2,342	None	SOCAL: West, Cove, Horse Beach Cove, NW Harbor, CPAAA
		Yes	All nearshore	84	None	SSTC Boat Lanes 1-8, 11-14; Bravo, Delta I, II, III, Echo, Fox, Golf, Hotel	84	None	SSTC Boat Lanes 1-8, 11-14; Bravo, Delta I, II, III, Echo, Fox, Golf, Hotel
Expeditionary Fires Exercise/ Supporting Arms Coordination Exercise	Marine Corps field training in integration of close air support, naval gunfire, artillery, and mortars.	Yes	Mostly nearshore but some open ocean	8	1,240 NEPM rounds; all landing ashore	SOCAL: San Clemente Island, SHOBA, SWTR Nearshore	8	1,045 rounds; all landing ashore	SOCAL: San Clemente Island, SHOBA, SWTR Nearshore
Anti-Surface Warfare (ASUW)									
Maritime Security Operations	Helicopter and surface ship crews conduct a suite of Maritime Security Operations (e.g., Vessel Search, Board, and Seizure; Maritime Interdiction Operations; Force Protection; and Anti-Piracy Operation).	No	>3 nm	90	None	SOCAL: W-291, OPAREA 3803, SOAR	150	None	SOCAL: W-291, OPAREA 3803, SOAR
		Yes	All nearshore	42	None	SSTC Boat Lanes 1-10	42	None	SSTC Boat Lanes 1-10

Notes: NEPM=Non-explosive Practice Munition; SOCAL=Southern California [Range Complex]; SHOBA=Shore Bombardment Area; SSTC=Silver Strand Training Complex; SWTR=Shallow Water Training Range; CPAAA=Camp Pendleton Amphibious Assault Area; NW = northwest; OPAREA = Operating Area; SOAR=Southern California Anti-submarine Warfare Range.

: Baseline and Proposed Training Activities (continued)

Range Activity	Description of Activity	Distribution		Baseline			Proposed Action		
		In CZ?	Discussion	No. of events (per year)	Ordnance (Number per year)	Location	No. of events (per year)	Ordnance (Number per year)	Location
Anti-Surface Warfare (ASUW) (continued)									
Gunnery Exercise (Surface-to-Surface) Ship – Small-caliber	Ship crews engage surface targets with ship's small-, medium-, and large-caliber guns.	Yes	Some nearshore but mostly open ocean	50	265,000 rounds	SOCAL: Warning Area-291, SHOBA, SOAR	350	1,855,000 rounds	SOCAL: Warning Area-291, SHOBA, SOAR
Gunnery Exercise (Surface-to-Surface) Ship – Medium-caliber	Ship crews engage surface targets with ship's small-, medium-, and large-caliber guns.	Yes	Some nearshore but mostly open ocean	150	30,000 rounds (15,000 HE)	SOCAL: Warning Area-291, SHOBA, SOAR	164	20,800 rounds (1,640 HE)	SOCAL: Warning Area-291, SHOBA, SOAR
Gunnery Exercise (Surface-to-Surface) Ship – Large-caliber	Ship crews engage surface targets with ship's small-, medium-, and large-caliber guns.	Yes	Some nearshore but mostly open ocean	150	30,000 rounds (15,000 HE)	SOCAL: Warning Area-291, SHOBA, SOAR	190	8,500 rounds (4,204 HE)	SOCAL: Warning Area-291, SHOBA, SOAR
Gunnery Exercise (Surface-to-Surface) Boat – Small-caliber	Small boat crews engage surface targets with small- and medium-caliber weapons.	Yes	Some nearshore but mostly open ocean	200	600,000	SOCAL: Warning Area-291, SHOBA	200	600,000	SOCAL: Warning Area-291, SHOBA
Gunnery Exercise (Surface-to-Surface) Boat – Medium-caliber	Small boat crews engage surface targets with small- and medium-caliber weapons.	Yes	Some nearshore but mostly open ocean	N/A	N/A	N/A	14	140 HE rounds 140 HE grenades 240 NEPM rounds	SOCAL: Warning Area-291, SHOBA

Notes: N/A = Not Analyzed. This event was not analyzed as part of the baseline. HE=High Explosive; SOCAL=Southern California [Range Complex]; SHOBA=Shore Bombardment Area; SOAR=Southern California Anti-submarine Warfare Range.

Table A-1: Baseline and Proposed Training Activities (continued)

Range Activity	Description of Activity	Distribution		Baseline			Proposed Action		
		In CZ?	Discussion	No. of events (per year)	Ordnance (Number per year)	Location	No. of events (per year)	Ordnance (Number per year)	Location
Anti-Surface Warfare (ASUW) (continued)									
Missile Exercise (Surface-to-Surface)	Surface ship crews defend against threat missiles and other surface ships with missiles.	No	>12 nm from shore	N/A	N/A	N/A	4	4 Missiles	SOCAL: Warning Area-291
Gunnery Exercise (Air-to-Surface) – Small-caliber	Fixed-wing and helicopter aircrews, including embarked personnel, use small- and medium-caliber guns to engage surface targets.	Yes	Nearshore and open ocean	60	48,000	SOCAL: Warning Area-291, (SOAR T-3, T-4, T-5, MTR-2)	131	104,800	SOCAL: Warning Area-291, (SOAR T-3, T-4, T-5, MTR-2)
Gunnery Exercise (Air-to-Surface) – Medium-caliber	Fixed-wing and helicopter aircrews, including embarked personnel, use small- and medium-caliber guns to engage surface targets.	Yes	Nearshore and open ocean	N/A	N/A	N/A	100	48,000 rounds (12,000 HE)	SOCAL: Warning Area-291, (SOAR T-3, T-4, T-5, MTR-2)
Missile Exercise (Air-to-Surface) – Rocket	Fixed-wing and helicopter aircrews fire both precision-guided missiles and unguided rockets against surface targets.	No	>12 nm from shore	N/A	N/A	N/A	130	3,800 rockets (3,800 HE)	SOCAL: Warning Area 291,SOAR, FLETA Hot, MISRs

Notes: N/A = Not Analyzed. This event was not analyzed as part of the baseline. HE=High Explosive; SOCAL=Southern California [Range Complex]; SOAR=Southern California Anti-submarine Warfare Range; MTR=Mine Training Range; FLETA=Fleet Training Area; MISR=Missile Range.

Table A-1: Baseline and Proposed Training Activities (continued)

Range Activity	Description of Activity	Distribution		Baseline			Proposed Action		
		In CZ?	Discussion	No. of events (per year)	Ordnance (Number per year)	Location	No. of events (per year)	Ordnance (Number per year)	Location
Anti-Surface Warfare (ASUW) (continued)									
Missile Exercise (Air-to-Surface)	Fixed-wing and helicopter aircrews fire both precision-guided missiles and unguided rockets against surface targets.	No	>12 nm from shore	20	20 HE missiles	SOCAL-SOAR, SHOBA (LTR 1/2)	214	214 HE missiles	SOCAL-SOAR, SHOBA (LTR 1/2)
Bombing Exercise (Air-to-Surface)	Fixed-wing aircrews deliver bombs against surface targets.	Yes	Nearshore and open ocean	40	1,280 bombs (640 HE bombs)	SOCAL-SOAR, T-3, T-4, T-5, MTR-2, SHOBA	120	1,280 bombs (160 HE bombs)	SOCAL-SOAR, T-3, T-4, T-5, MTR-2, SHOBA
Laser Targeting	Fixed-winged, helicopter, and ship crews illuminate enemy targets with lasers.	Yes	Some on SCI but mostly open ocean	30	None	SOCAL-SOAR, SHOBA (LTR 1/2)	250	None	SOCAL-SOAR, SHOBA (LTR 1/2)
Sinking Exercise	Aircraft, ship, and submarine crews deliver ordnance on a seaborne target, usually a deactivated ship, which is deliberately sunk using multiple weapon systems.	No	> 12 nm from shore	2	12 HE Bombs 22 HE Missiles 1,400 HE Large-caliber rounds 2 MK 48 HE	SOCAL: Warning Area-291	2	12 Bombs (6 HE) 4 Missiles (2 HE) 100 Large-caliber rounds (40 HE) 2 MK 48 HE 4,000 Medium-caliber NEPM	SOCAL: Warning Area-291

Notes: HE=High Explosive; NEPM = Non-explosive Practice Munition; SOCAL=Southern California [Range Complex]; SOAR=Southern California Anti-submarine Warfare Range; MTR=Mine Training Range; SHOBA=Shore Bombardment Area; LTR=Laser Training Range.

Table A-1: Baseline and Proposed Training Activities (continued)

Range Activity	Description of Activity	Distribution		Baseline			Proposed Action		
		In CZ?	Discussion	No. of events (per year)	Ordnance (Number per year)	Location	No. of events (per year)	Ordnance (Number per year)	Location
Anti-Submarine Warfare (ASW)									
Tracking Exercise/ Torpedo Exercise – Submarine	Submarine crews search, detect, and track submarines and surface ships. Exercise torpedoes may be used during this event.	Yes	Some nearshore but mostly open ocean	62	76 MK 48 EXTORP	SOCAL OPAREAs, SOAR (Tanner-Cortez Bank, SWTR-NS)	63	76 MK 48 EXTORP	SOCAL OPAREAs, SOAR (Tanner-Cortez Bank, SWTR-NS)
Tracking Exercise/ Torpedo Exercise-Surface	Surface ship crews search, track, and detect submarines. Exercise torpedoes may be used during this event.	Yes	Some nearshore but mostly open ocean	925	7 EXTORP 18 REXTORP	SOCAL-SOCAL OPAREAs, PMSR	540	48 EXTORP 69 REXTORP	SOCAL-SOCAL OPAREAs, PMSR
Tracking Exercise/ Torpedo Exercise-Helicopter	Helicopter crews search, track, and detect submarines. Exercise torpedoes may be used during this event.	Yes	Some nearshore but mostly open ocean	447	6 EXTORP 245 REXTORP	SOCAL-SOAR, SWTR, San Clemente Island Underwater Range	628	6 EXTORP 200 REXTORP	SOCAL-SOAR, SWTR, San Clemente Island Underwater Range
Tracking Exercise/ Torpedo Exercise-Maritime Patrol Aircraft	Maritime patrol aircraft crews search, detect, and track submarines. Recoverable air launched torpedoes may be employed against submarine targets.	Yes	Some nearshore but mostly open ocean	46	29 EXTORP 17 REXTORP	SOCAL-SOAR, (SWTR-OS, SWTR-NS), SWTR, SOCAL OPAREAs	116	24 EXTORP 17 REXTORP	SOCAL-SOAR, (SWTR-OS, SWTR-NS), SWTR, SOCAL OPAREAs

Notes: EXTORP=Exercise Torpedo; REXTORP=Recoverable Exercise Torpedo; SOCAL=Southern California [Range Complex]; OPAREA=Operating Area; SOAR=Southern California Anti-submarine Warfare Range; SWTR=Shallow Water Training Range; OS=Offshore; NS=Nearshore; PMSR=Point Mugu Sea Range (overlap area only).

Table A-1: Baseline and Proposed Training Activities (continued)

Range Activity	Description of Activity	Distribution		Baseline			Proposed Action		
		In CZ?	Discussion	No. of events (per year)	Ordnance (Number per year)	Location	No. of events (per year)	Ordnance (Number per year)	Location
Anti-Submarine Warfare (ASW) (continued)									
Tracking Exercise-Maritime Patrol Advanced Extended Echo Ranging Sonobuoys	Maritime patrol aircraft crews search, detect and track submarines using explosive source sonobuoys or multistatic active coherent system.	No	> 12 nm from shore	3	None	SOCAL OPAREAs, PMSR, SOAR (SWTR-OS, SWTR-NS)	48	120 IEER buoys 360 MAC buoys	SOCAL OPAREAs, PMSR, SOAR (SWTR-OS, SWTR-NS)
Kilo Dip-Helicopter	Helicopter crews briefly deploy their dipping Acoustic Sources to ensure the system's operational status.	No	All in HCOTAs >3 nm from shore	1,060	None	SOCAL: HCOTAs	1,060	None	SOCAL: HCOTAs
Electronic Warfare (EW)									
Electronic Warfare Operations	Aircraft, surface ship, and submarine crews attempt to control portions of the electromagnetic spectrum used by enemy systems to degrade or deny the enemy's ability to take defensive actions.	Yes	Some nearshore but mostly open ocean	400	None	SOCAL Waters (Electronic Warfare Range)	350	None	SOCAL Waters (Electronic Warfare Range)

Notes: SOCAL=Southern California [Range Complex]; SOAR=Southern California Anti-submarine Warfare Range; SWTR=Shallow Water Training Range; OS=Offshore; NS=Nearshore; OPAREA=Operating Area; PMSR=Point Mugu Sea Range (overlap area only); HCOTA=Helicopter Offshore Training Area.

Table A-1: Baseline and Proposed Training Activities (continued)

Range Activity	Description of Activity	Distribution		Baseline			Proposed Action		
		In CZ?	Discussion	No. of events (per year)	Ordnance (Number per year)	Location	No. of events (per year)	Ordnance (Number per year)	Location
Electronic Warfare (EW) (continued)									
Counter Targeting Flare Exercise	Fixed-winged aircraft and helicopters crews defend against an attack by deploying flares to disrupt threat infrared missile guidance systems.	No	> 12 nm from shore	25	None	SOCAL Waters (Electronic Warfare Range)	25	None	SOCAL Waters (Electronic Warfare Range)
Counter Targeting Chaff Exercise – Ship	Surface ships, fixed-winged aircraft, and helicopter crews defend against an attack by deploying chaff, a radar reflective material, which disrupt threat targeting and missile guidance radars.	No	> 12 nm from shore	125	None	SOCAL Waters (Electronic Warfare Range)	125	None	SOCAL Waters (Electronic Warfare Range)
Counter Targeting Chaff Exercise – Aircraft	Surface ships, fixed-winged aircraft, and helicopter crews defend against an attack by deploying chaff, a radar reflective material, which disrupt threat targeting and missile guidance radars.	No	> 12 nm from shore	250	None	SOCAL Waters (Electronic Warfare Range)	250	None	SOCAL Waters (Electronic Warfare Range)

Notes: SOCAL=Southern California [Range Complex].

Table A-1: Baseline and Proposed Training Activities (continued)

Range Activity	Description of Activity	Distribution		Baseline			Proposed Action		
		In CZ?	Discussion	No. of events (per year)	Ordnance (Number per year)	Location	No. of events (per year)	Ordnance (Number per year)	Location
Mine Warfare (MIW)									
Mine Countermeasure (MCM) Exercise-MCM Sonar-Ship Sonar	Surface ship crews detect and avoid mines while navigating restricted areas or channels using active sonar.	Yes	Mostly nearshore and some open ocean	48	None	SOCAL-Kingfisher, Tanner-Cortez Bank, Pyramid Cove, CPAAA, Imperial Beach Minefield	92	None	SOCAL-Kingfisher, Tanner-Cortez Bank, Pyramid Cove, CPAAA, Imperial Beach Minefield
Mine Countermeasure Exercise – Surface	MCM-class ship crews detect, locate, identify, and avoid mines while navigating restricted areas or channels using active sonar.	Yes	Mostly nearshore and some open ocean	380	None	SOCAL: Kingfisher, Tanner-Cortez Bank, Imperial Beach Minefield, SSTC, CPAAA	266	None	SOCAL: Kingfisher, Tanner-Cortez Bank, Imperial Beach Minefield, SSTC, CPAAA
Mine Neutralization – Explosive Ordnance Disposal	Personnel disable threat mines. Explosive charges may be used.	Yes	Mostly nearshore and some open ocean	85	85 HE	SOCAL-TAR 2, 3, and 21, SWAT-1&2, SOAR, SWTR	75	300 HE	SOCAL-TAR 2, 3, and 21, SWAT-1&2, SOAR, SWTR
				279	408 HE	SSTC Boat Lanes 1-14	279	414 HE	SSTC Boat Lanes 1-14

Notes: SOCAL=Southern California [Range Complex]; SWTR=Shallow Water Training Range; CPAAA=Camp Pendleton Amphibious Assault Area; SSTC=Silver Strand Training Complex; SOAR=Southern California Anti-submarine Warfare Range; SWAT=Special Warfare Training Area.

Table A-1: Baseline and Proposed Training Activities (continued)

Range Activity	Description of Activity	Distribution		Baseline			Proposed Action		
		In CZ?	Discussion	No. of events (per year)	Ordnance (Number per year)	Location	No. of events (per year)	Ordnance (Number per year)	Location
Mine Warfare (MIW) (continued)									
Mine Countermeasure – Towed Mine Neutralization	Ship crews and helicopter aircrews tow systems (e.g., Organic and Surface Influence Sweep, MK 104/105) through the water that are designed to disable and/or trigger mines.	Yes	Mostly nearshore and some open ocean	240	None	SOCAL-Pyramid cove, NW Harbor, Imperial Beach, SSTC	240	None	SOCAL-Pyramid cove, NW Harbor, Imperial Beach, SSTC
				100	None	All SSTC Boat Lanes 1-14, in water > 40 ft.	100	None	All SSTC Boat Lanes 1-14, in water > 40 ft.
Airborne Mine Countermeasure – Mine Detection	Helicopter aircrews detect mines using towed and laser mine detection systems (e.g., AN/AQS-20, Airborne Laser Mine Detection System).	Yes	Mostly nearshore and some open ocean	420	None	SOCAL-Pyramid cove, NW Harbor, Imperial Beach, SSTC	420	None	SOCAL-Pyramid cove, NW Harbor, Imperial Beach, SSTC
				248	None	All SSTC Boat Lanes 1-14, in water > 40 ft.	248	None	All SSTC Boat Lanes 1-14, in water > 40 ft.
Mine Countermeasure – Mine Neutralization	Ship crews or helicopter aircrews disable mines by firing small- and medium-caliber projectiles.	Yes	Mostly nearshore and some open ocean	36	360 rounds	SOCAL-Pyramid cove, NW Harbor, Kingfisher Training Range, MTR-1, MTR-2, Imperial Beach Minefield	36	360 rounds	SOCAL-Pyramid cove, NW Harbor, Kingfisher Training Range, MTR-1, MTR-2, Imperial Beach Minefield

Notes: HE=High Explosive; SOCAL=Southern California [Range Complex]; SSTC=Silver Strand Training Complex; NW=Northwest; MTR=Mine Training Range.

Table A-1: Baseline and Proposed Training Activities (continued)

Range Activity	Description of Activity	Distribution		Baseline			Proposed Action		
		In CZ?	Discussion	No. of events (per year)	Ordnance (Number per year)	Location	No. of events (per year)	Ordnance (Number per year)	Location
Mine Warfare (MIW) (continued)									
Mine Neutralization – Remotely Operated Vehicle	Helicopter aircrews disable mines using remotely operated underwater vehicles.	Yes	Mostly nearshore and some open ocean	36	8 HE	SOCAL: Kingfisher, Tanner-Cortez Bank, Imperial Beach Minefield, CPAAA	40	8 HE	SOCAL: Kingfisher, Tanner-Cortez Bank, Imperial Beach Minefield, CPAAA
				208	18 HE Note 1	SSTC-All SSTC Boat Lanes 1-14 Breakers Beach, Delta I, II, and Delta North, Echo	208	20 HE Note 1	SSTC-All SSTC Boat Lanes 1-14 Breakers Beach, Delta I, II, and Delta North, Echo
Mine Laying	Fixed-winged aircraft and submarine crews drop/launch non explosive mine shapes.	Yes	Mostly nearshore and some open ocean	18	216 mine shapes	SOCAL: MTRs, SWTR, Pyramid Cove, China Point	18	750 mine shapes	SOCAL: MTRs, SWTR, Pyramid Cove, China Point
Marine Mammal System	Navy personnel and Navy marine mammals work together to detect and neutralize specified underwater objects.	Yes	Mostly nearshore and some open ocean	208	8 HE Note 1	All SSTC Boat Lanes 1-14 Breakers Beach	175	8 HE Note 1	All SSTC Boat Lanes 1-14 Breakers Beach
Shock Wave Action Generator	Navy divers place a small charge on a simulated underwater mine.	Yes	Only nearshore	90	90 HE	All SSTC Boat Lanes 1-14 SSTC San Diego Bay-Echo	90	90 HE	All SSTC Boat Lanes 1-14 SSTC San Diego Bay-Echo

Notes: Note 1: Underwater detonations associated with this training occur only in the boat lanes. SOCAL=Southern California [Range Complex]; SSTC=Silver Strand Training Complex; MTR=Mine Training Range; HE=High Explosive; CPAAA=Camp Pendleton Amphibious Assault Area; SWTR=Shallow Water Training Range.

Table A-1: Baseline and Proposed Training Activities (continued)

Range Activity	Description of Activity	Distribution		Baseline			Proposed Action		
		In CZ?	Discussion	No. of events (per year)	Ordnance (Number per year)	Location	No. of events (per year)	Ordnance (Number per year)	Location
Mine Warfare (MIW) (continued)									
Surf Zone Test Detachment/ Equipment Test and Evaluation	Navy personnel test and evaluate the effectiveness of new detection and neutralization equipment designated for surf conditions.	Yes	Only nearshore	200	None	All SSTC Boat Lanes 1-14 SSTC San Diego Bay-Echo	200	None	All SSTC Boat Lanes 1-14 SSTC San Diego Bay-Echo
Submarine Mine Exercise	Submarine crews practice detecting mines in a designated area.	Yes	Some nearshore but mostly open ocean	N/A	N/A	N/A	32	None	ARPA Training Minefield, SOCAL OPAREA, Tanner-Cortez Bank
Maritime Homeland Defense/ Security Mine Countermeasure	Maritime homeland defense/security mine countermeasures are naval mine warfare activities conducted at various ports and harbors, in support of maritime homeland defense/security.	Yes	Mostly nearshore and some open ocean	N/A	N/A	N/A	1	4 HE	San Diego, CA
Naval Special Warfare (NSW)									
Personnel Insertion/ Extraction-Submarine	Military personnel train for covert insertion and extraction into target areas using submarines.	Yes	Only nearshore	40	None	SSTC Boat Lanes 1-10 Delta III, Echo, Foxtrot, Golf, Hotel	40	None	SSTC Boat Lanes 1-10 Delta III, Echo, Foxtrot, Golf, Hotel

Notes: N/A = Not Analyzed. This event was not analyzed as part of the baseline. SOCAL=Southern California [Range Complex]; SSTC=Silver Strand Training Complex; HE=High Explosive; OPAREA=Operating Area; SOCAL=Southern California [Range Complex]; ARPA=Advanced Research Projects Agency.

Table A-1: Baseline and Proposed Training Activities (continued)

Range Activity	Description of Activity	Distribution		Baseline			Proposed Action		
		In CZ?	Discussion	No. of events (per year)	Ordnance (Number per year)	Location	No. of events (per year)	Ordnance (Number per year)	Location
Naval Special Warfare (NSW) (continued)									
Personnel Insertion/ Extraction – Non-submarine	Military personnel train for covert insertion and extraction into target areas using helicopters, fixed-wing aircraft (insertion only), or small boats.	Yes	Mostly nearshore and some open ocean	15	None	SOCAL OPAREA, San Clemente Island	15	None	SOCAL OPAREA, San Clemente Island
		Yes	Only nearshore	394	None	All SSTC Boat Lanes 1-14 Echo	394	None	All SSTC Boat Lanes 1-14 Echo
Underwater Demolition Multiple Charge – Mat Weave and Obstacle Loading	Navy personnel train to construct, place, and safely detonate multiple charges laid in a pattern for underwater obstacle clearance.	Yes	Only nearshore	18	18 HE	SOCAL: NW Harbor (TAR 2 and 3), SWAT	18	18 HE	SOCAL: NW Harbor (TAR 2 and 3), SWAT
Underwater Demolition Qualification/ Certification	Navy divers conduct training and certification in placing underwater demolition charges.	Yes	Only nearshore	24	30 HE	All SSTC Boat and Beach Lanes 1-14	24	30 HE	All SSTC Boat and Beach Lanes 1-14

Notes: N/A = Not Analyzed. This event was not analyzed as part of the baseline; HE=High Explosive; SSTC=Silver Strand Training Complex; SOCAL=Southern California [Range Complex]; OPAREA=Operating Area; NW=Northwest; TAR=Training Areas and Ranges; SWAT=Special Warfare Training Area.

Table A-1: Baseline and Proposed Training Activities (continued)

Range Activity	Description of Activity	Distribution		Baseline			Proposed Action		
		In CZ?	Discussion	No. of events (per year)	Ordnance (Number per year)	Location	No. of events (per year)	Ordnance (Number per year)	Location
Major Training Events									
Composite Training Unit Exercise	Intermediate level exercise designed to create a cohesive Strike Group prior to deployment or Joint Task Force Exercise. Typically seven surface ships, helicopters, maritime patrol aircraft, two submarines, and various unmanned vehicles.	Yes	Some nearshore but mostly open ocean	4	Note 1	SOCAL-SOCAL OPAREA and PMSR	4	Note 1	SOCAL-SOCAL OPAREA and PMSR
Joint Task Force Exercise/ Sustainment Exercise	Final fleet exercise prior to deployment of the Strike Group. Serves as a ready-to-deploy certification for all units involved. Typically nine surface ships, helicopters, maritime patrol aircraft, two submarines, and various unmanned vehicles.	Yes	Some nearshore but mostly open ocean	4	Note 1	SOCAL-SOCAL OPAREA and PMSR	6	Note 1	SOCAL-SOCAL OPAREA and PMSR

Note 1: Exercise is comprised of various activities accounted for elsewhere within Table A-1.
Notes: SOCAL=Southern California [Range Complex]; OPAREA=Operating Area; PMSR=Point Mugu Sea Range (overlap area only).

Table A-1: Baseline and Proposed Training Activities (continued)

Range Activity	Description of Activity	Distribution		Baseline			Proposed Action		
		In CZ?	Discussion	No. of events (per year)	Ordnance (Number per year)	Location	No. of events (per year)	Ordnance (Number per year)	Location
Major Training Events (continued)									
Integrated Anti-Submarine Warfare Course	Multiple ships, aircraft and submarines integrate the use of their sensors, including sonobuoys, to search, detect, and track threat submarines. IAC is an intermediate level training event and can occur in conjunction with other major exercises.	Yes	Some nearshore but mostly open ocean	4	Note 1	SOCAL OPAREA-SOAR	4	Note 1	SOCAL OPAREA-SOAR
Group Sail	Multiple ships and helicopters integrate the use of sensors, including sonobuoys, to search, detect, and track a threat submarine. Group sails are not dedicated ASW events and involve multiple warfare areas.	Yes	Some nearshore but mostly open ocean	N/A	N/A	N/A	8	Note 1	SOCAL OPAREA
Other									
Precision Anchoring	Releasing of anchors in designated locations.	Yes	Only nearshore	72	None	SSTC-Anchorages	72	None	SSTC-Anchorages

Note 1: Exercise is comprised of various activities accounted for elsewhere within Table A-1.
Notes: N/A = Not Analyzed. This event was not analyzed as part of the baseline. SOCAL=Southern California [Range Complex]; OPAREA=Operating Area; SOAR=Southern California Anti-submarine Warfare Range; SSTC=Silver Strand Training Complex.

Table A-1: Baseline and Proposed Training Activities (continued)

Range Activity	Description of Activity	Distribution		Baseline			Proposed Action		
		In CZ?	Discussion	No. of events (per year)	Ordnance (Number per year)	Location	No. of events (per year)	Ordnance (Number per year)	Location
Other (continued)									
Small Boat Attack	For this activity, one or two small boats or personal watercraft conduct attack activities on units afloat.	Yes	Mostly nearshore and some open ocean	36	10,500 blank rounds	SSTC Boat Lanes 1-10	36	10,500 blank rounds	SSTC Boat Lanes 1-10
Offshore Petroleum Discharge System	This activity trains personnel in the transfer of petroleum (though only sea water is used during training) from ship to shore.	Yes	Only nearshore	6	None	SSTC Boat Lanes 1-10, Bravo, Waters outside of boat lanes	6	None	SSTC Boat Lanes 1-10, Bravo, Waters outside of boat lanes, CPAAA
Elevated Causeway System	A temporary pier is constructed off the beach. Supporting pilings are driven into the sand and then later removed.	Yes	Only nearshore	4	None	SSTC Boat Lanes 1-10, Designated Bravo Beach training lane	4	None	SSTC Boat Lanes 1-10, Designated Bravo Beach training lane, CPAAA
Submarine Navigation Exercise	Submarine crews locate underwater objects and ships while transiting out of port.	Yes	Only nearshore	N/A	N/A	N/A	84	None	Subase Pt. Loma and seaward virtual channel
Submarine Under Ice Certification	Submarine crews train to operate under ice. Ice conditions are simulated during training and certification events.	No	>12 nm from shore	N/A	N/A	N/A	6	None	SOCAL OPAREAs

Notes: N/A = Not Analyzed. This event was not analyzed as part of the baseline. SOCAL=Southern California [Range Complex]; OPAREA=Operating Area; SSTC=Silver Strand Training Complex; CPAAA = Camp Pendleton Amphibious Assault Area.

Table A-1: Baseline and Proposed Training Activities (continued)

Range Activity	Description of Activity	Distribution		Baseline			Proposed Action		
		In CZ?	Discussion	No. of events (per year)	Ordnance (Number per year)	Location	No. of events (per year)	Ordnance (Number per year)	Location
Other (continued)									
Surface Ship Sonar Maintenance	Pier side and at-sea maintenance of sonar systems.	Yes	Only nearshore	N/A	N/A	N/A	488	None	SOCAL OPAREA, San Diego Bay and ports
Submarine Sonar Maintenance	Pier side and at-sea maintenance of sonar systems.	Yes	Mostly nearshore and some open ocean	N/A	N/A	N/A	68	None	SOCAL OPAREA and inport San Diego

Notes: N/A = Not Analyzed. This event was not analyzed as part of the baseline. SOCAL=Southern California [Range Complex]; OPAREA=Operating Area.

Table A-2: Baseline and Proposed Naval Air Systems Command Testing Activities

Range Activity	Description of Activity	Distribution		Baseline			Proposed Action		
		In CZ?	Discussion	No. of events (per year)	Ordnance (Number per year)	Location	No. of events (per year)	Ordnance (Number per year)	Location
Anti-Air Warfare (AAW)									
Air Combat Maneuver	This event is identical to the air combat maneuver training event.	No	>12 nm from shore	100	None	SOCAL OPAREA	110	None	SOCAL OPAREA
Air Platform/ Vehicle Test	Testing performed to quantify the flying qualities, handling, airworthiness, stability, controllability, and integrity of an air platform or vehicle. No weapons are released during an air platform/vehicle test. In-flight refueling capabilities are tested.	No	>12 nm from shore	300	None	SOCAL OPAREA	385	None	SOCAL OPAREA
Air Platform Weapons Integration Test	Testing performed to quantify the compatibility of weapons with the aircraft from which they would be launched or released. Mostly non-explosive weapons or shapes are used, but some tests may require the use of high explosive weapons.	No	>12 nm from shore	150	5 missiles, 3,000 medium caliber rounds	SOCAL OPAREA	165	28 missiles, 22,000 medium caliber rounds, 330 rockets	SOCAL OPAREA

Notes: OPAREA=Operating Area; SOCAL=Southern California [Range Complex].

Table A-2: Baseline and Proposed Naval Air Systems Command Testing Activities (continued)

Range Activity	Description of Activity	Distribution		Baseline			Proposed Action		
		In CZ?	Discussion	No. of events (per year)	Ordnance (Number per year)	Location	No. of events (per year)	Ordnance (Number per year)	Location
Anti-Air Warfare (AAW) (continued)									
Intelligence, Surveillance, and Reconnaissance Test	Test to evaluate communications capabilities of fixed-wing and rotary wing aircraft, including unmanned systems that can carry cameras, sensors, communications equipment, or other payloads. New systems are tested at sea to ensure proper communications between aircraft and ships.	No	>12 nm from shore	45	None	SOCAL OPAREA	50	None	SOCAL OPAREA
Anti-Surface Warfare (ASUW)									
Air-to-Surface Missile Test	This event is similar to the training event missile exercise (air-to-surface).	No	>12 nm from shore	89	98 missiles (24 HE)	SOCAL OPAREA	100	156 missiles (48 HE)	SOCAL OPAREA
Air-to-Surface Gunnery Test	This event is similar to the training event gunnery exercise air to surface.	No	>12 nm from shore	20	6,000 (1,500 HE) medium-caliber rounds	SOCAL OPAREA	55	44,000 medium-caliber rounds (11,000 HE)	SOCAL OPAREA

Notes: OPAREA=Operating Area; SOCAL=Southern California [Range Complex]; HE=High Explosive.

Table A-2: Baseline and Proposed Naval Air Systems Command Testing Activities (continued)

Range Activity	Description of Activity	Distribution		Baseline			Proposed Action		
		In CZ?	Discussion	No. of events (per year)	Ordnance (Number per year)	Location	No. of events (per year)	Ordnance (Number per year)	Location
Anti-Surface Warfare (ASUW) (continued)									
Rocket Test	Rocket tests evaluate the integration, accuracy, performance, and safe separation of laser-guided and unguided 2.75-inch rockets fired from a hovering or forward flying helicopter or from a fixed wing strike aircraft.	No	>12 nm from shore	15	15 rockets (NEPM)	SOCAL OPAREA	66	748 rockets (202 HE)	SOCAL OPAREA
Laser Targeting Test	Aircrew use laser targeting devices integrated into aircraft or weapon systems to evaluate targeting accuracy and precision and to train aircrew in the use of newly developed or enhanced laser targeting devices. Lasers are designed to illuminate designated targets for engagement with laser-guided weapons.	No	>12 nm from shore	5	None	SOCAL OPAREA	6	None	SOCAL OPAREA

Notes: OPAREA=Operating Area; SOCAL=Southern California [Range Complex]; NEPM = Non-explosive Practice Munitions; HE=High Explosive.

Table A-2: Baseline and Proposed Naval Air Systems Command Testing Activities (continued)

Range Activity	Description of Activity	Distribution		Baseline			Proposed Action		
		In CZ?	Discussion	No. of events (per year)	Ordnance (Number per year)	Location	No. of events (per year)	Ordnance (Number per year)	Location
Electronic Warfare (EW)									
Electronic Systems Evaluation	Test that evaluates the effectiveness of electronic systems to control, deny, or monitor critical portions of the electromagnetic spectrum. In general, electronic warfare testing will assess the performance of three types of electronic warfare systems: electronic attack, electronic protect, and electronic support.	No	>12 nm from shore	150	None	SOCAL OPAREA	670	None	SOCAL OPAREA
Anti-Submarine Warfare (ASW)									
Anti-submarine Warfare Torpedo Test	This event is similar to the training event torpedo exercise.	Yes	Some nearshore but mostly open ocean	10	20 torpedoes (All NEPM)	SOCAL OPAREA	36	70 torpedoes (All NEPM)	SOCAL OPAREA
Kilo Dip	A kilo dip is the operational term used to describe a functional check of a helicopter deployed dipping sonar system. The sonar system is briefly activated to ensure all systems are functional.	No	>12 nm from shore	4	None	SOCAL OPAREA	5	None	SOCAL OPAREA

Notes: NEPM=Non-explosive Practice Munition; SOCAL=Southern California [Range Complex]; OPAREA=Operating Area.

Table A-2: Baseline and Proposed Naval Air Systems Command Testing Activities (continued)

Range Activity	Description of Activity	Distribution		Baseline			Proposed Action		
		In CZ?	Discussion	No. of events (per year)	Ordnance (Number per year)	Location	No. of events (per year)	Ordnance (Number per year)	Location
Anti-Submarine Warfare (ASW) (continued)									
Sonobuoy Lot Acceptance Test	Sonobuoys are deployed from surface vessels and aircraft to verify the integrity and performance of a lot, or group, of sonobuoys in advance of delivery to the fleet for operational use.	Yes	Some nearshore but mostly open ocean	29	660 (HE) sonobuoys	SOCAL OPAREA	36	744 (HE) sonobuoys	SOCAL OPAREA
Anti-submarine Warfare Tracking Test – Helicopter	This event is similar to the training event ASW tracking exercise (helicopter).	Yes	Some nearshore but mostly open ocean	10	None	SOCAL OPAREA	188	1,267 HE sonobuoys	SOCAL OPAREA
Anti-submarine Warfare Tracking Test – Maritime Patrol Aircraft	This event is similar to the training event tracking exercise/ torpedo exercise—maritime patrol aircraft.	Yes	Some nearshore but mostly open ocean	51	1,992 HE sonobuoys	SOCAL OPAREA	33	1,004 HE sonobuoys	SOCAL OPAREA
Mine Warfare (MIW)									
Airborne Mine Neutralization System Test	Airborne mine neutralization tests of the AN/ASQ-235 evaluate the system's ability to detect and destroy mines from a MH-60S helicopter. The AN/ASQ-235 uses up to four unmanned underwater vehicles equipped with high-frequency sonar, video cameras, and explosive neutralizers.	Yes	Mostly nearshore but some open ocean	15	20 HE neutralizers	SOCAL OPAREA	17	53 HE neutralizers	SOCAL OPAREA

Notes: HE=High Explosive; SOCAL=Southern California [Range Complex]; OPAREA=Operating Area.

Table A-2: Baseline and Proposed Naval Air Systems Command Testing Activities (continued)

Range Activity	Description of Activity	Distribution		Baseline			Proposed Action		
		In CZ?	Discussion	No. of events (per year)	Ordnance (Number per year)	Location	No. of events (per year)	Ordnance (Number per year)	Location
Mine Warfare (MIW)									
Airborne Towed Minehunting Sonar System Test	Tests of the AN/AQS-20A to evaluate the search capabilities of this towed, mine hunting, detection, and classification system. The sonar on the AN/AQS-20A identifies mine-like objects in the deeper parts of the water column.	Yes	Mostly nearshore but some open ocean	15	None	SOCAL OPAREA	17	None	SOCAL OPAREA
Airborne Towed Minesweeping System Test	Tests of the Organic Airborne and Surface Influence Sweep (OASIS) would be conducted by a MH-60S helicopter to evaluate the functionality of OASIS and the MH-60S at sea. The OASIS is towed from a forward flying helicopter and works by emitting an electromagnetic field and mechanically generated underwater sound to simulate the presence of a ship.	Yes	Mostly nearshore but some open ocean	15	None	SOCAL OPAREA	17	None	SOCAL OPAREA

Notes: OPAREA=Operating Area; SOCAL=Southern California [Range Complex].

Table A-2: Baseline and Proposed Naval Air Systems Command Testing Activities (continued)

Range Activity	Description of Activity	Distribution		Baseline			Proposed Action		
		In CZ?	Discussion	No. of events (per year)	Ordnance (Number per year)	Location	No. of events (per year)	Ordnance (Number per year)	Location
Mine Warfare (MIW) (continued)									
Airborne Laser-Based Mine Detection System Test	An airborne mine hunting test of the AN/AES-1 ALMDS evaluates the system's ability to detect, classify, and fix the location of floating and near-surface, moored mines. The system uses a laser to locate mines and may operate in conjunction with an airborne projectile-based mine detection system to neutralize mines.	Yes	Some nearshore but mostly open ocean	15	None	SOCAL OPAREA	17	None	SOCAL OPAREA
Airborne Projectile-based Mine Clearance System Test	A MH-60S helicopter uses a laser-based detection system to search for mines and fix locations for neutralization with an airborne projectile-based mine clearance system. The system neutralizes mines by firing a small- or medium-caliber non-explosive, supercavitating projectile from a hovering helicopter.	Yes	Some nearshore but mostly open ocean	5	100 medium caliber rounds (All NEPM)	SOCAL OPAREA	17	330 medium caliber rounds (All NEPM), 6 HE mines	SOCAL OPAREA

Notes: SOCAL=Southern California [Range Complex]; OPAREA=Operating Area; NEPM=Non-explosive Practice Munition; HE=High Explosive.

Table A-2: Baseline and Proposed Naval Air Systems Command Testing Activities (continued)

Range Activity	Description of Activity	Distribution		Baseline			Proposed Action		
		In CZ?	Discussion	No. of events (per year)	Ordnance (Number per year)	Location	No. of events (per year)	Ordnance (Number per year)	Location
Other Testing									
Test and Evaluation – Catapult Launch	Tests evaluate the function of aircraft carrier catapults at sea following enhancements, modifications, or repairs to catapult launch systems. This includes aircraft catapult launch tests. No weapons or other expendable materials would be released.	No	>12 nm from shore	8,700	None	HSTT Study Area	9,570	None	HSTT Study Area
Air Platform Shipboard Integrate Test	Tests evaluate the compatibility of aircraft and aircraft systems with ships and shipboard systems. Tests involve physical operations and verify and evaluate communications and tactical data links. This test function also includes an assessment of carrier-shipboard suitability, and hazards of electromagnetic radiation to personnel, ordnance, and fuels.	No	>12 nm from shore	124	None	HSTT Study Area	136	None	HSTT Study Area

Notes: HSTT=Hawaii-Southern California Training and Testing

Table A-2: Baseline and Proposed Naval Air Systems Command Testing Activities (continued)

Range Activity	Description of Activity	Distribution		Baseline			Proposed Action		
		In CZ?	Discussion	No. of events (per year)	Ordnance (Number per year)	Location	No. of events (per year)	Ordnance (Number per year)	Location
Other Testing (continued)									
Shipboard Electronic Systems Evaluation	Tests measure ship antenna radiation patterns and test communication systems with a variety of aircraft.	No	>12 nm from shore	124	None	HSTT Study Area	136	None	HSTT Study Area

Notes: HSTT=Hawaii-Southern California Training and Testing

Table A-3: Baseline and Proposed Naval Sea Systems Command Testing Activities

Range Activity	Description of Activity	Distribution		Baseline			Proposed Action		
		In CZ?	Discussion	No. of events (per year)	Ordnance (Number per year)	Location	No. of events (per year)	Ordnance (Number per year)	Location
New Ship Construction									
Surface Combatant Sea Trials									
Pierside Sonar Testing	Tests ship's sonar systems pierside to ensure proper operation.	Yes	Conducted pierside	N/A	N/A	N/A	2	None	Pierside: San Diego, CA
Propulsion Testing	Ship is run at high speeds in various formations (e.g., straight-line and reciprocal paths).	No	>12 nm from shore	N/A	N/A	N/A	2	None	SOCAL
Gun Testing – Large-caliber	Gun systems are tested using non-explosive rounds.	Yes	Nearshore and open ocean	N/A	N/A	N/A	2	52 rounds 1,400 medium-caliber rounds	SOCAL
Missile Testing	Explosive and non-explosive missiles are fired at target drones to test the launching system.	No	>12 nm from shore	N/A	N/A	N/A	2	4 HE missiles	SOCAL
Decoy Testing	Includes testing of the MK 36 Decoy Launching system	No	>12 nm from shore	N/A	N/A	N/A	2	None	SOCAL
Surface Warfare Testing	Ships defend against surface targets with large- and medium-caliber guns.	No	>12 nm from shore	N/A	N/A	N/A	2	96 large-caliber rounds	SOCAL

Notes: N/A = Not Analyzed. This event was not analyzed as part of the baseline. CA=California; SOCAL=Southern California [Range Complex] ; HE=High Explosive.

Table A-3: Baseline and Proposed Naval Sea Systems Command Testing Activities (continued)

Range Activity	Description of Activity	Distribution		Baseline			Proposed Action		
		In CZ?	Discussion	No. of events (per year)	Ordnance (Number per year)	Location	No. of events (per year)	Ordnance (Number per year)	Location
New Ship Construction (continued)									
Surface Combatant Sea Trials (continued)									
Anti-Submarine Warfare Testing	Ships demonstrate capability of countermeasure systems and underwater surveillance and communications systems.	No	>12 nm from shore	N/A	N/A	N/A	2	None	SOCAL
Other Ship Class[Note1] Sea Trials									
Propulsion Testing	Ship is run at high speeds in various formations (e.g., straight-line and reciprocal paths).	No	>12 nm from shore	N/A	N/A	N/A	21	None	SOCAL
Gun Testing – Small Caliber	Gun systems are tested using non-explosive rounds.	Yes	Nearshore and open ocean	N/A	N/A	N/A	6	6,000 rounds	SOCAL
ASW Mission Package Testing									
ASW Mission Package Testing	Ships and their supporting platforms (e.g., helicopters, unmanned aerial vehicles) detect, localize, and prosecute submarines.	Yes	Nearshore and open ocean	None	None	None	40	40 torpedoes	SOCAL

Note 1: "Other Ships" indicates classes of vessels without hull-mounted sonar. Example ship classes include LCS, MLP, and T-AKE.
Notes: N/A = Not Analyzed. This event was not analyzed as part of the baseline. SOCAL=Southern California [Range Complex]

Table A-3: Baseline and Proposed Naval Sea Systems Command Testing Activities (continued)

Range Activity	Description of Activity	Distribution		Baseline			Proposed Action		
		In CZ?	Discussion	No. of events (per year)	Ordnance (Number per year)	Location	No. of events (per year)	Ordnance (Number per year)	Location
New Ship Construction (continued)									
Surface Warfare Mission Package Testing									
Gun Testing – Small-caliber	Ships defense against surface targets with small, medium, and large caliber guns and medium range missiles.	Yes	Nearshore and open ocean	None	None	None	5 (either location)	2,500 rounds	HRC SOCAL
Gun Testing – Medium-caliber	Ships defense against surface targets with small, medium, and large caliber guns and medium range missiles.	Yes	Nearshore and open ocean	None	None	None	5 (either location)	7,000 rounds (3,500 HE)	HRC SOCAL
Gun Testing – Large-caliber	Ships defense against surface targets with small, medium, and large caliber guns and medium range missiles.	Yes	Nearshore and open ocean	None	None	None	5 (either location)	7,000 rounds (4,900 HE)	HRC SOCAL
Missile/ Rocket Testing	Non-explosive missiles are fired at target drones to test the launching system.	No	>12 nm from shore	None	None	None	15 (either location)	30 missiles/ rockets (15 HE)	HRC SOCAL

Notes: SOCAL=Southern California [Range Complex]; HRC=Hawaii Range Complex; ASW=Anti-submarine Warfare; HE=High Explosive.

Table A-3: Baseline and Proposed Naval Sea Systems Command Testing Activities (continued)

Range Activity	Description of Activity	Distribution		Baseline			Proposed Action		
		In CZ?	Discussion	No. of events (per year)	Ordnance (Number per year)	Location	No. of events (per year)	Ordnance (Number per year)	Location
New Ship Construction (continued)									
MCM Mission Package Testing									
Mine Countermeasure	Ships conduct mine countermeasure operations.	Yes	Nearshore and open ocean	None	None	None	4	None	SOCAL: CPAAA
							8	128 neutralizers (64 HE)	SOCAL: Pyramid Cove
							4	None	SOCAL: Tanner Bank Minefield
Post-Homeporting Testing									
Post-Homeporting Testing (all classes)	Tests all ship systems, including navigation and propulsion systems.	Yes	Nearshore and open ocean	N/A	N/A	N/A	22	None	SOCAL
Life Cycle Activities									
Ship Signature Testing	Tests ship and submarine radars and electromagnetic signatures.	Yes	Nearshore and open ocean	N/A	N/A	N/A	39	None	SOCAL
Surface Ship Sonar Testing/Maintenance (in OPAREAs and Ports)	Pierside and at-sea testing of surface ship systems occurs periodically following major maintenance periods and for routine maintenance.	Yes	Nearshore and open ocean	N/A	N/A	N/A	10	None	SOCAL

Notes: N/A = Not Analyzed. This event was not analyzed as part of the baseline. ASW=Anti-submarine Warfare; HE=High Explosive; SOCAL=Southern California [Range Complex]; CPAAA=Camp Pendleton Amphibious Assault Area; OPAREA=Operating Area.

Table A-3: Baseline and Proposed Naval Sea Systems Command Testing Activities (continued)

Range Activity	Description of Activity	Distribution		Baseline			Proposed Action		
		In CZ?	Discussion	No. of events (per year)	Ordnance (Number per year)	Location	No. of events (per year)	Ordnance (Number per year)	Location
Life Cycle Activities (continued)									
Submarine Sonar Testing/Maintenance (in OPAREAs and Ports)	Pierside and at-sea testing of submarine systems occurs periodically following major maintenance periods and for routine maintenance.	Yes	Nearshore and open ocean	N/A	N/A	N/A	9	None	SOCAL
Combat System Ship Qualification Trial (CSSQT)									
In-port Maintenance Period	Each combat system is tested to ensure they are functioning in a technically acceptable manner and are operationally ready to support at-sea Combat System Ship Qualification Trials.	Yes	Conducted pierside	N/A	N/A	N/A	2	None	Pierside: San Diego, CA
Air Defense	Tests the ship's capability to detect, identify, track, and successfully engage live and simulated targets.	No	>12 nm from shore	N/A	N/A	N/A	2	2 HE missiles	SOCAL

Notes: N/A = Not Analyzed. This event was not analyzed as part of the baseline. HE=High Explosive; SOCAL=Southern California [Range Complex]; CA=California; OPAREA=Operating Area.

Table A-3: Baseline and Proposed Naval Sea Systems Command Testing Activities (continued)

Range Activity	Description of Activity	Distribution		Baseline			Proposed Action		
		In CZ?	Discussion	No. of events (per year)	Ordnance (Number per year)	Location	No. of events (per year)	Ordnance (Number per year)	Location
Life Cycle Activities (continued)									
Combat System Ship Qualification Trial (continued)									
Anti-surface Warfare	Tests shipboard sensors capabilities to detect and track surface targets, relay the data to the gun weapon system, and engage targets.	No	>12 nm from shore	N/A	N/A	N/A	13	14,000 medium caliber rounds, 3,420 large caliber rounds (1,511 HE), 9 missiles	SOCAL
Undersea Warfare	Tests ships ability to track and engage undersea targets.	Yes	Nearshore and open ocean	N/A	N/A	N/A	11	88 torpedoes	SOCAL
Anti-Surface Warfare/Anti-Submarine Warfare Testing									
Missile Testing	Missile testing includes various missiles fired from submarines and surface combatants.	No	>12 nm from shore	N/A	N/A	N/A	24 (either location)	24 missiles	HRC: PMRF SOCAL
Electronic Warfare Testing	Testing will include radiation of military and commercial radar and communication systems or simulators.	No	>3 nm from shore	N/A	N/A	N/A	54	None	SOCAL

Notes: N/A = Not Analyzed. This event was not included in the baseline. HE=High Explosive; SOCAL=Southern California [Range Complex]; HRC=Hawaii Range Complex; PMRF=Pacific Missile Range Facility.

Table A-3: Baseline and Proposed Naval Sea Systems Command Testing Activities (continued)

Range Activity	Description of Activity	Distribution		Baseline			Proposed Action		
		In CZ?	Discussion	No. of events (per year)	Ordnance (Number per year)	Location	No. of events (per year)	Ordnance (Number per year)	Location
Anti-Surface Warfare/Anti-Submarine Warfare Testing (continued)									
Torpedo (Non-explosive) Testing	Air, surface, or submarine crews employ non-explosive torpedoes against submarines or surface vessels. All torpedoes are recovered.	No	>3 nm from shore	15	240 torpedoes	SOCAL: Tanner Bank Minefield, SOAR, or SHOBA	17	391 torpedoes	SOCAL: Tanner Bank Minefield, SOAR, or SHOBA
Torpedo (Explosive) Testing	Air, surface, or submarine crews employ high-explosive torpedoes against artificial targets or deactivated ships.	No	>3 nm from shore	N/A	N/A	N/A	2	28 torpedoes (8 HE)	SOCAL
Countermeasure Testing	Various acoustic systems (e.g., towed arrays and surface ship torpedo defense systems) are employed to detect, localize, track, and neutralize incoming weapons.	No	>3 nm from shore	N/A	N/A	N/A	2	84 torpedoes	SOCAL
Pierside Sonar Testing	Pierside testing to ensure systems are fully functional in a controlled pierside environment prior to at-sea test activities.	Yes	Conducted pierside	N/A	N/A	N/A	10 (either location)	None	Pierside: Pearl Harbor, HI Pierside: San Diego, CA

Notes: N/A = Not Analyzed. This event was not analyzed as part of the baseline. SOCAL=Southern California [Range Complex]; SOAR=Southern California Anti-Submarine Warfare Range; SHOBA=Shore Bombardment Area; HE=High Explosive; CA=California; HI=Hawaii.

Table A-3: Baseline and Proposed Naval Sea Systems Command Testing Activities (continued)

Range Activity	Description of Activity	Distribution		Baseline			Proposed Action		
		In CZ?	Discussion	No. of events (per year)	Ordnance (Number per year)	Location	No. of events (per year)	Ordnance (Number per year)	Location
Anti-Surface Warfare/Anti-Submarine Warfare Testing (continued)									
At-sea Sonar Testing	At-sea testing to ensure systems are fully functional in an open ocean environment.	No	>3 nm from shore	N/A	N/A	N/A	20 (either location)	None	HRC SOCAL
Mine Warfare Testing									
Mine Detection and Classification Testing	Air, surface, and subsurface vessels detect and classify mines and mine-like objects.	Yes	Nearshore and open ocean	N/A	N/A	N/A	5	None	SOCAL
							3	None	SOCAL: Mission Bay Training Minefield
Mine Countermeasure / Neutralization Testing	Air, surface, and subsurface vessels neutralize threat mines that would otherwise restrict passage through an area.	Yes	Nearshore and open ocean	N/A	N/A	N/A	14	28 HE charges	SOCAL
Pierside Systems Health Checks	Mine warfare systems are tested in pierside locations to ensure acoustic and electromagnetic sensors are fully functional prior to at-sea test activities.	Yes	Conducted pierside	N/A	N/A	N/A	4	None	Pierside: San Diego, CA

Notes: N/A = Not Analyzed. This event was not analyzed as part of the baseline. HRC=Hawaii Range Complex; SOCAL=Southern California [Range Complex]; CA=California; HE=High Explosive.

Table A-3: Baseline and Proposed Naval Sea Systems Command Testing Activities (continued)

Range Activity	Description of Activity	Distribution		Baseline			Proposed Action		
		In CZ?	Discussion	No. of events (per year)	Ordnance (Number per year)	Location	No. of events (per year)	Ordnance (Number per year)	Location
Shipboard Protection Systems and Swimmer Defense Testing									
Pierside Integrated Swimmer Defense	Swimmer defense testing ensures that systems can effectively detect, characterize, verify, and engage swimmer/diver threats in harbor environments.	Yes	Conducted pierside	5	None	Pierside: San Diego, CA	5	None	Pierside: San Diego, CA
Shipboard Protection Systems Testing	Loudhailers and small caliber munitions are used to protect a ship against small boat threats.	Yes	Conducted pierside	N/A	N/A	N/A	4	None	Pierside: San Diego, CA
		No	>3 nm from shore				4	1,300 rounds (small-caliber)	SOCAL
Chemical/ Biological Simulant Testing	Chemical/biological agent simulants are deployed against surface ships.	No	>3 nm from shore	N/A	N/A	N/A	440 (either location)	None	HRC
									SOCAL
Unmanned Vehicle Testing									
Underwater Deployed Unmanned Aerial Vehicle Testing	Unmanned aerial systems are launched by submarines and special operations forces while submerged.	No	>3 nm from shore	N/A	N/A	N/A	30 (either location)	None	HRC
									SOCAL

Notes: N/A = Not Analyzed. This event was not analyzed as part of the baseline. CA=California; HRC=Hawaii Range Complex; SOCAL=Southern California [Range Complex].

Table A-3: Baseline and Proposed Naval Sea Systems Command Testing Activities (continued)

Range Activity	Description of Activity	Distribution		Baseline			Proposed Action		
		In CZ?	Discussion	No. of events (per year)	Ordnance (Number per year)	Location	No. of events (per year)	Ordnance (Number per year)	Location
Unmanned Vehicle Testing (continued)									
Unmanned Vehicle Development and Payload Testing	Vehicle development involves the production and upgrade of new unmanned platforms on which to attach various payloads used for different purposes.	Yes	Nearshore and open ocean	N/A	N/A	N/A	26	None	SOCAL
Other Testing									
Special Warfare	Special warfare includes testing of submersibles capable of inserting and extracting personnel or payloads into denied areas from strategic distances.	Yes	Nearshore and open ocean	None	None	None	4 (either location)	None	HRC SOCAL
Acoustic Communications Testing	Acoustic modems, submarines, and surface vessels transmit signals to communicate.	Yes	Nearshore and open ocean	N/A	N/A	N/A	2 (either location)	None	HRC SOCAL

Notes: N/A = Not Analyzed. This event was not analyzed as part of the baseline. HRC=Hawaii Range Complex; SOCAL=Southern California [Range Complex].

Table A-4: Baseline and Proposed Space and Naval Warfare Systems Command Testing Activities

Range Activity	Description of Activity	Distribution		Baseline			Proposed Action		
		In CZ?	Discussion	No. of events (per year)	Ordnance (Number per year)	Location	No. of events (per year)	Ordnance (Number per year)	Location
SPAWAR Research, Development, Test, and Evaluation (RDT&E)									
Autonomous Undersea Vehicle Anti-Terrorism/ Force Protection Mine Countermeasure	Autonomous undersea vehicle shallow water mine countermeasure testing is focused on the testing of unmanned undersea vehicles with mine hunting sensors in marine environments in and around rocky outcroppings. Anti-terrorism/force protection mine countermeasures testing is focused on mine countermeasure missions in confined areas between piers and pilings.	Yes	Nearshore and open ocean	68	None	SOCAL	92	None	SOCAL
Autonomous Undersea Vehicle Underwater Communications	This testing is focused on providing two-way networked communications below the ocean surface while maintaining mission profile.	Yes	Nearshore and open ocean	68	None	SOCAL	92	None	SOCAL

Notes: Activities in this table located in SOCAL may occur in San Diego Bay. SPAWAR= Space and Naval Warfare Systems Command; SOCAL=Southern California [Range Complex].

Table A-4: Baseline and Proposed Space and Naval Warfare Systems Command Testing Activities

Range Activity	Description of Activity	Distribution		Baseline			Proposed Action		
		In CZ?	Discussion	No. of events (per year)	Ordnance (Number per year)	Location	No. of events (per year)	Ordnance (Number per year)	Location
SPAWAR Research, Development, Test, and Evaluation (RDT&E) (continued)									
Fixed System Underwater Communications	Fixed underwater communications systems testing is focused on testing stationary or free floating equipment that provides two-way networked communications below the ocean surface while maintaining mission profile.	Yes	Nearshore and open ocean	27	None	SOCAL	37	None	SOCAL
AUV Autonomous Oceanographic Research and Meteorology and Oceanography	The research is comprised of ocean gliders and autonomous undersea vehicles. Gliders are portable, long-endurance buoyancy driven vehicles that provide a means to sample and characterize ocean water properties. Autonomous undersea vehicles are larger, shorter endurance vehicles.	No	>3 nm from shore	68	None	SOCAL	92	None	SOCAL

Notes: Activities in this table located in SOCAL may occur in San Diego Bay. AUV= Autonomous Undersea Vehicle; SPAWAR= Space and Naval Warfare Systems Command; SOCAL=Southern California [Range Complex].

Table A-4: Baseline and Proposed Space and Naval Warfare Systems Command Testing Activities

Range Activity	Description of Activity	Distribution		Baseline			Proposed Action		
		In CZ?	Discussion	No. of events (per year)	Ordnance (Number per year)	Location	No. of events (per year)	Ordnance (Number per year)	Location
SPAWAR Research, Development, Test, and Evaluation (RDT&E) (continued)									
Fixed Autonomous Oceanographic Research and Meteorology and Oceanography	The goal of these systems is to develop, integrate, and demonstrate deployable autonomous undersea technologies that improve the Navy's capability to conduct effective anti-submarine warfare and intelligence, surveillance, and reconnaissance operations in littoral waters.	Yes	Nearshore and open ocean	18	None	SOCAL	26	None	SOCAL
Passive Mobile Intelligence, Surveillance, and Reconnaissance Sensor Systems	These systems use passive arrays hosted by surface and subsurface vehicles and vessels for conducting submarine detection and tracking experiments and demonstrations.	Yes	Nearshore and open ocean	21	None	SOCAL	27	None	SOCAL
Fixed Intelligence, Surveillance, and Reconnaissance Sensor Systems	These systems use stationary fixed arrays for conducting submarine detection and tracking experiments and demonstrations.	Yes	Nearshore and open ocean	21	None	SOCAL	39	None	SOCAL

Notes: Activities in this table located in SOCAL may occur in San Diego Bay. SPAWAR= Space and Naval Warfare Systems Command; SOCAL=Southern California [Range Complex].

Table A-4: Baseline and Proposed Space and Naval Warfare Systems Command Testing Activities

Range Activity	Description of Activity	Distribution		Baseline			Proposed Action		
		In CZ?	Discussion	No. of events (per year)	Ordnance (Number per year)	Location	No. of events (per year)	Ordnance (Number per year)	Location
SPAWAR Research, Development, Test, and Evaluation (RDT&E) (continued)									
Anti-Terrorism/ Force Protection Fixed Sensor Systems	These systems use stationary fixed arrays for providing protection of Navy assets from underwater threats.	Yes	Only nearshore	9	None	SOCAL	11	None	SOCAL

Notes: Activities in this table located in SOCAL may occur in San Diego Bay. SPAWAR= Space and Naval Warfare Systems Command; SOCAL=Southern California [Range Complex].

CD-049-08 - CCC Conditions

1. Safety Zones. The Navy shall adopt safety zones (i.e., marine mammal preclusion zones) from the sonar source out to the distance at which the sonar has attenuated to 154 dB (received level (RL), expressed in decibels (re 1 $\mu Pa^2 \cdot s$)). The Navy will monitor the area and lower sonar levels (or delay transmissions until an animal has left the safety zone) such that marine mammals and sea turtles will not be exposed to received levels greater than 154 dB. If the 154 dB level cannot be feasibly achieved, the Navy shall either (a) cease sonar transmissions whenever a marine mammal or sea turtle is detected within 2 km of the sonar dome; or (b) provide the Commission with sufficient information about the sonar intensities and attenuation rates, the maximum capabilities of its monitoring, and its proposed procedures, to enable the Commission to determine that the Navy will protect a safety zone as close as is possible to the 154 dB zone. The Navy shall provide this information to the Commission staff for review and approval by the Executive Director prior to the first exercise involving mid-frequency sonar and shall comply with the approved procedures.

2. Elimination of expanded ASW training/instrumentation in the Tanner and Cortes Banks (Exhibits 2-3)**.** The Navy shall either:

(a) eliminate from its proposed activities the proposed expansion of the shallow water training range in the Tanner and Cortes Banks; OR

(b) agree to not conduct any activities in these banks using mid-frequency sonar at levels exceeding 154 dB (source level) from May to November, the period of regularly surveyed high concentrations of foraging blue and fin whales in this area.

3. Gray Whale Migration Season. To the maximum extent feasible, the Navy shall locate and schedule training outside the gray whale migration season, where the sonar employed in the training activities would otherwise be near enough to known or observed gray whale migration paths to expose gray whales in such paths to sonar levels above 154 dB. If conducting exercises during the migration season the Navy shall avoid known gray whale migration corridors.

4. Areas of High Marine Mammal Populations. To the maximum extent feasible, the Navy shall avoid training using high-intensity mid-frequency sonar in areas with known high concentrations of marine mammals, including but not limited to avoiding any active sonar transmissions:

(a) within the National Marine Sanctuaries off California's coast (e.g., the Channel Islands NMS)(and which includes the waters around Santa Barbara Island);

(b) within the Catalina Basin (between the Catalina and San Clemente Escarpments (Exhibit 3);

Exhibit 19
CD-008-13

(c) seasonally (during the warm water months of May to November) in the Tanner and Cortes Banks (Exhibits 2-3, and 15) (and as defined on page 55 (i.e., within 10 nm of the 200 fathom isobath defining Tanner and Cortes Banks)); and

(d) adjacent to seamounts and coastal areas with complex, steep seabed topography, except on the Navy's instrumented range off San Clemente Island.

5. Night and low visibility conditions. The Navy shall operate mid-frequency sonar under reduced power during low visibility conditions, as follows:

Low visibility conditions (i.e., whenever the entire safety zone cannot be effectively monitored due to nighttime, high sea state, fog or other factors) – The Navy will use additional detection measures, such as infrared (IR) or enhanced passive acoustic detection. Except in extraordinary circumstances, the Navy will power down sonar by 6 dB as if marine mammals were present in the zones it cannot see.

6. Surface Ducting Conditions. During significant surface ducting conditions, as defined by NMFS (2006), the Navy shall power down the sonar source by 6 dB from the maximum level that would otherwise be allowed by these conditions. The Navy shall assess whether surface ducting conditions are present at least once hourly during periods as specified by NMFS.

7. Choke-point exercises. Prior to implementing choke-point or simulated choke-point exercises, Navy commands shall:

- Provide NMFS (Stranding Coordinator and Protected Resources, Headquarters) with information regarding the time and place for the choke-point exercises in advance of any proposed choke-point exercise.

- Not proceed unless the Navy receives NMFS' approval as to whether non-Navy observers are required.

- Coordinate a focused monitoring effort around the choke-point/simulated choke-point exercise, to include pre-exercise monitoring (2 hours), during-exercise monitoring, and post-exercise monitoring (1-2 days). This monitoring effort will include at least one dedicated aircraft or one dedicated vessel for realtime monitoring from the pre- through post-monitoring time period, except at night, with the vessel or airplane maintaining regular communication with a Tactical Officer with the authority to shutdown, power-down, or delay the start-up of sonar operations. These monitors will communicate with the Navy command to ensure the safety zones are clear prior to sonar start-up, to recommend power-down and shut-down during the exercise, and to search extensively for potentially injured or stranding animals in the area and downcurrent of the area post-exercise.

8. Baseline Monitoring. The Navy shall perform pre-exercise aerial monitoring commencing 60 minutes prior to commencement of mid-frequency sonar use, except as discussed in Condition 11, where additional pre-exercise monitoring is stipulated, in accordance with the District Court Order in its Modified Preliminary Injunction, January 10, 2007, page 4.

9. Five-Year Term for Consistency Determination. The Navy agrees that this federal consistency authorization is limited to a five-year period, from January 1, 2009 to December 31, 2013. Any Navy SOCAL training or testing scheduled to occur after that period shall be the subject of a subsequent consistency determination submitted by the Navy.

Because the Navy agreed to implement the originally-recommended Conditions 2, 4, 5, 9 and 12 into the project description, these conditions have been eliminated as conditions and are relocated to be included in the project description.

2. Surveillance. Surveillance shall include two dedicated NOAA-trained marine mammal observers at all times during use of mid-frequency sonar. NOAA training includes using qualified watchstanders who have completed marine species awareness training and who have been approved by NMFS.

4. Passive Acoustic Monitoring. The Navy shall employ passive acoustic monitoring to enforce the safety zones described in Condition 1. All personnel engaged in passive acoustic sonar operations during an exercise employing mid-frequency sonar shall monitor for marine mammals and sea turtles and report the detection of any marine mammal or sea turtle to the appropriate watch station for dissemination and appropriate action.

5. Aerial Monitoring. The Navy shall ensure that aircraft operating in the Navy's instrumented range off San Clemente will monitor the area for marine mammals and sea turtles during their assigned missions and will monitor the area throughout any mid-frequency sonar exercises on the instrumented range. All other Naval aircraft flying low enough to reasonably spot a marine mammal and sea turtles will watch for them. The Navy shall require that all aerial sightings of marine mammals and sea turtles be reported to the appropriate watch stations for appropriate action. Appropriate action means taking mitigation measures and disseminating the information to other units and watchstanders for increased situational awareness.

9. Stranding Response and Reporting/Marine Mammal Monitoring. The Navy shall coordinate with the NMFS Stranding Coordinator for any unusual marine mammal behavior, including stranding, beached live or dead cetacean(s), floating marine mammals, or out-of-habitat/milling live cetaceans that may occur at any time during or shortly after major exercises. The Navy shall submit its proposed stranding protocols being worked out with NMFS to the Commission staff, prior to commencement of the first exercise using mid-frequency sonar. These protocols shall include direct notification to NMFS' Long Beach Office when the Navy notifies NMFS of any of the above unusual behaviors. The protocols shall also include provisions for a third party scientific observer for any necropsy performed, drawn from a list to be supplied by the Commission staff, and agreed to by NMFS, with the

understanding that allowance of such observer shall not in any way interfere with or delay NMFS' necropsy procedures or activities. The Navy shall also continue to submit "after-action" reports to NMFS and to the Commission staff after the completion of a major exercises, which will include:

- An assessment of the effectiveness of these mitigation and monitoring measures with recommendations of how to improve them.

- Results of the marine species monitoring during the major exercise. As much unclassified information as the Navy can provide including, but not limited to, where and when sonar was used (including sources not considered in take estimates, such as submarine and aircraft sonars) in relation to any measured received levels, source levels, numbers of sources, and frequencies, so it can be coordinated with observed cetacean behaviors. If necessary, classified information may be provided to NMFS personnel with an appropriate security clearance and need to know.

12. Mine Shape Retrieval. To the maximum extent feasible, the Navy shall retrieve inert mine shapes dropped.

CD-086-06 - CCC Conditions

1. Safety Zones. The Navy shall adopt safety zones (i.e., marine mammal preclusion zones) out to the distance at which the sonar has attenuated to 154 dB (received level (RL), expressed in decibels (re 1 $\mu Pa^2 \cdot s$)). The Navy will monitor the area and lower sonar levels (or delay transmissions until an animal has left the safety zone) such that marine mammals and sea turtles will not be exposed to received levels greater than 154 dB. If the 154 dB level cannot be feasibly achieved, the Navy shall either cease sonar transmissions should a marine mammal be detected within 2 km of the sonar dome, as the Navy has currently agreed to for its SURTASS LFA sonar operations, or the Navy shall provide the Commission with sufficient information about the sonar intensities and attenuation rates, and the maximum capabilities of its monitoring, to enable the Commission to determine that the Navy will protect a safety zone as close as is possible to the 154 dB zone. The Navy shall provide this information to the Commission staff for review and approval by the Executive Director prior to the first exercise involving mid-frequency sonar.

2. Surveillance. Surveillance shall include two dedicated NOAA-trained marine mammal observers at all times during use of mid-frequency sonar.

3. Training. The Navy shall employ the RIMPAC-derived measures, which state:

> **NMFS-Approved Training**
> • Navy shipboard lookouts shall be qualified watchstanders who have completed marine species awareness training.
> - Navy watchstanders will participate in marine mammal observer training approved by NMFS.

4. Passive Acoustic Monitoring. Passive acoustic monitoring will be used to enforce safety zones. All personnel engaged in passive acoustic sonar operations during an exercise employing mid-frequency sonar shall monitor for marine mammals and report the detection of any marine mammal to the appropriate watch station for dissemination and appropriate action.

5. Aerial Monitoring. The Navy shall ensure that aircraft operating in the Navy's instrumented range off San Clemente will monitor the area for marine mammals during their assigned missions and will monitor the area throughout any mid-frequency sonar exercises on the instrumented range. All other aircraft flying low enough to reasonably spot a marine mammal will watch for marine mammals. The Navy shall require that all aerial sightings of marine mammals be reported to the appropriate watch stations for appropriate action. Appropriate action means taking mitigation measures and disseminating the information to other units and watchstanders for increased situational awareness.

6. Gray Whale Migration Season. To the maximum extent feasible, the Navy shall locate and schedule training outside the gray whale migration season, where the sonar is near enough to known or observed gray whale migration paths to expose gray whales to sonar levels

above 154 dB. If conducting exercises during the migration season the Navy shall avoid known gray whale migration corridors.

7. Areas of High Marine Mammal Populations. To the maximum extent feasible, the Navy shall avoid training in areas with known high concentrations of marine mammals, including but not limited to:

> avoiding active sonar transmissions within the National Marine Sanctuaries off California's coast (e.g., the Channel Islands NMS); and
>
> avoiding seamounts and coastal areas with complex, steep seabed topography, except on the Navy's instrumented range off San Clemente Island.

8. Night and low visibility conditions. The Navy shall employ the RIMPAC-derived measures, which state[1]:

> **Low visibility conditions (i.e., whenever the entire safety zone cannot be effectively monitored due to nighttime, high sea state, fog or other factors) –** The Navy will use additional detection measures, such as infrared (IR) or enhanced passive acoustic detection. Except in extraordinary circumstances, the Navy will power down sonar by 6 dB as if marine mammals were present in the zones it cannot see.

9. Stranding Response and Reporting. The Navy shall employ the RIMPAC-derived measures, which state:

> • The Navy will coordinate with the NMFS Stranding Coordinator for any unusual marine mammal behavior, including stranding, beached live or dead cetacean(s), floating marine mammals, or out-of-habitat/milling live cetaceans that may occur at any time during or shortly after major exercises.
>
> • The Navy will provide a report to NMFS after the completion of a major exercise that includes:
>
> - An assessment of the effectiveness of these mitigation and monitoring measures with recommendations of how to improve them.
>
> - Results of the marine species monitoring during the major exercise. As much unclassified information as the Navy can provide including, but not limited to, where

[1] In fact, the U.S. Marine Mammal Commission has specifically recommended that, "given the limitations of night vision devices (based on [NMFS'] assessment in its previous Federal Register notices) and passive acoustic monitoring," the Navy observe a mandatory power-down in low-visibility conditions, assuming it cannot simply avoid them (MMC 2006). (Comments from Tim Ragen, Acting Executive Director, Marine Mammal Commission, to P. Michael Payne, Chief of the Permits Division, NMFS, on the Navy's 2006 Rim of the Pacific (RIMPAC) Exercise.)

and when sonar was used (including sources not considered in take estimates, such as submarine and aircraft sonars) in relation to any measured received levels, source levels, numbers of sources, and frequencies, so it can be coordinated with observed cetacean behaviors. If necessary, classified information may be provided to NMFS personnel with an appropriate security clearance and need to know.

10. Surface Ducting Conditions. During significant surface ducting conditions, as defined by NMFS (2006), the Navy shall power down the sonar source by 6 dB. The Navy shall assess whether surface ducting conditions are present at least once hourly during periods as specified by NMFS (and as discussed on page 3 of the NMFS IHA for RIMPAC (Exhibit 13)).

11. Choke-point exercises. - Prior to approving a proposed choke-point exercise, Navy commands shall consult with OPNAV N45.

- The Navy will provide NMFS (Stranding Coordinator and Protected Resources, Headquarters) with information regarding the time and place for the choke-point exercises in advance of any proposed choke-point exercise.

- The Navy and NMFS will mutually agree upon whether non-Navy observers are required.

- The Navy will coordinate a focused monitoring effort around the choke-point exercises, to include pre-exercise monitoring (2 hours), during-exercise monitoring, and post-exercise monitoring (1-2 days). This monitoring effort will include at least one dedicated aircraft or one dedicated vessel for realtime monitoring from the pre- through post-monitoring time period, except at night, with the vessel or airplane maintaining regular communication with a Tactical Officer with the authority to shutdown, power-down, or delay the start-up of sonar operations. These monitors will communicate with the Navy command to ensure the safety zones are clear prior to sonar start-up, to recommend power-down and shut-down during the exercise, and to extensively search for potentially injured or stranding animals in the area and downcurrent of the area post-exercise.

12. Mine Shape Retrieval. To the maximum extent feasible, the Navy shall retrieve inert mine shapes dropped.

13. Monitoring Reports. In addition to the above, as agreed to previously, all monitoring results provided to NMFS (unless classified) shall be submitted to the Commission staff.

14. Baseline Monitoring. The Navy shall perform pre-exercise monitoring commencing 30 minutes prior to commencement of mid-frequency sonar use.

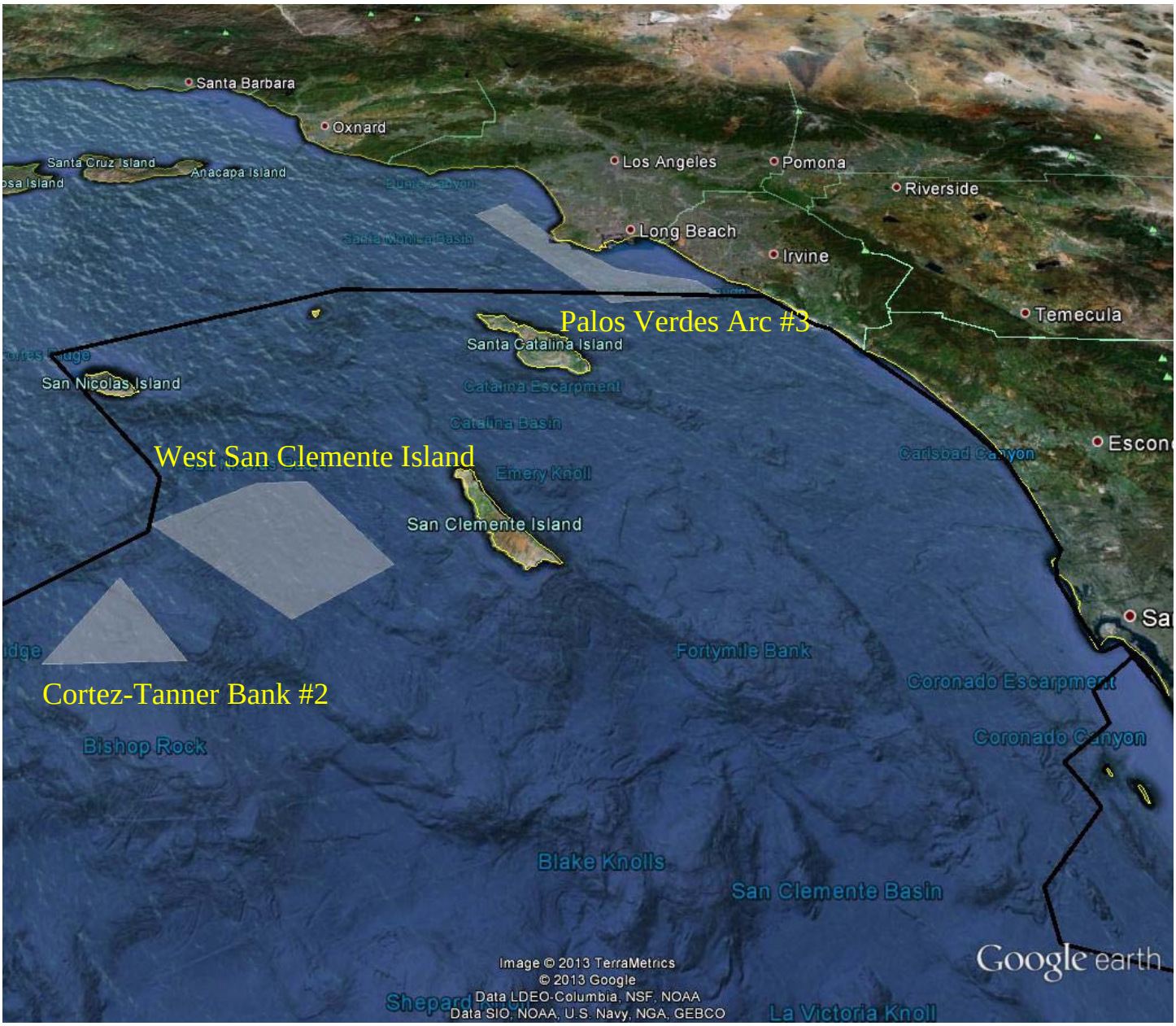


FIGURE 3: Identified biologically important areas for fin whales (Balaenoptera physalus)
Figure 3 depicts three Areas that have consistently been identified as seasonally (June - November) biologically important habitat for endangered fin whales. Two of the Areas (Cortez-Tanner Bank #2 and West San Clemente Island) fall entirely within the SOCAL portion of the HSTT Study Area. The Palos Verdes Arc Area #3 partially falls within the Study Area.

Exhibit 20
CD-008-13

UNITED STATES DEPARTMENT OF COMMERCE
The Under Secretary of Commerce
for Oceans and Atmosphere
Washington, D.C. 20230

JAN 19 2010

Ms. Nancy Sutley
Chair, Council on Environmental Quality
730 Jackson Place, NW
Washington, DC 20503

Dear Nancy,

I write to report to you on the National Oceanic and Atmospheric Administration's (NOAA) review of mitigation measures in rules authorizing take of marine mammals incidental to Navy training exercises, and to inform you of the plan with respect to future work with the Navy on possible additional mitigation measures.

As you recall, on January 20, 2009, as the Obama Administration was taking office, NOAA's National Marine Fisheries Service (NMFS) was in the process of publishing a regulation that would establish a framework to authorize the take of marine mammals incidental to the Navy training exercises involving use of mid-frequency active sonar on its ranges along the Atlantic Coast and in the Gulf of Mexico. Earlier in January, NMFS had published similar rules related to the take of marine mammals incidental to Navy training on Navy training ranges in Hawaii and Southern California. This issue has a history of being controversial, and you requested that NOAA conduct a comprehensive review of all mitigation measures applicable to the use of sonar.

NMFS intended the comprehensive review to give the new Administration an opportunity to understand the process used to develop the rules, and also to evaluate the adequacy of the mitigation measures required by the rule. Each rule took months to develop jointly by the Navy and NOAA scientists, with input from the public during a comment process on the proposed rules. For each rule, an Environmental Impact Statement (EIS) was prepared by the Navy and adopted by NOAA regarding Navy training exercises. In addition to the EISs, for each rule, NMFS prepared an Environmental Assessment in which it specifically considered a suite of mitigation measures, many of which had been recommended by members of the public during the public comment process. In those assessments, NMFS evaluated the potential effectiveness and benefit of each possible mitigation measure. Also, as required by the Marine Mammal Protection Act, NMFS reviewed the practicability of each of the mitigation measures in light of the impact on personnel safety, the practicality of implementation, and the impacts on the Navy's ability to achieve its training goals.

In the Environmental Assessments, NMFS also identified the relevant uncertainties regarding the impacts of the proposed training on marine mammals. Two are worth highlighting. One involves lack of knowledge about the mechanisms whereby some species of marine mammals, particularly beaked whales, are adversely affected by mid-frequency active sonar. The other concerns the difficulties of limiting the impact of active sonar where the mitigation efforts depend on visual sighting of whales. The ongoing mitigation efforts, in our view, must do more

Exhibit 21
CD-008-13

to address both of these uncertainties. NMFS included adaptive management provisions in the rules as a mechanism for improving the effectiveness of mitigation, as appropriate. NMFS also required the Navy to provide after-action reports following each exercise, which NMFS will monitor and use to modify mitigation measures, as appropriate. Thus, there are some mechanisms already in place to improve mitigation measures in the long run as new information becomes available.

In the short run, as a result of our findings in this review, NOAA will undertake three specific activities to address the issue of whether there are areas of biological significance impacted by these permitted activities and others undertaken under permits from NMFS (such as oil and gas exploration). First, NMFS, in concert with other civilian agencies (e.g., Minerals Management Service), would like to reinitiate comprehensive aerial cetacean and sea turtle surveys (i.e., multipurpose surveys). I will encourage the Navy to be part of the planning process for these new surveys, and to support their implementation. These surveys will provide not only fine-scale density estimates of whales in particularly sensitive or otherwise important areas (e.g., the ranges), but also provide improved population estimates supporting listing decisions and activities of take reduction teams.

Second, NMFS will conduct a workshop to develop a plan for estimating a comprehensive sound budget for the oceans. We will invite the Navy and other agencies to take part. There is currently a great deal of concern that a variety of human sources of marine sound (e.g., vessel traffic, seismic activity, sonar, and construction activities) are acting in a cumulative way to degrade the environment in which sound-sensitive animals communicate. There are no comprehensive baselines with which to measure the cumulative sound impacts such as increased military vessel traffic and emitted sound, e.g., in the ranges.

Third, NMFS will organize another workshop this year to learn more about marine mammal "hot spots." The Navy and NMFS have made substantial investments in models of existing whale distribution and environmental data to predict abundance and distribution of whales and other mammals in specific locations. As part of this focus, the workshop will evaluate these models, developed primarily for the Northwest Atlantic and the California Current and eastern tropical Pacific, and assess their general applicability. Such models, if verified, have great potential to assist in the design of appropriate mitigation measures that are effective and efficient. Protecting important marine mammal habitat is generally recognized to be the most effective mitigation measure currently available.

In addition, there are ongoing activities that NMFS will be conducting with the Navy because they are required by the permits that have been issued. For example, NMFS has required that the Navy convene a workshop to review and modify, as appropriate, the monitoring measures included in the regulations. This workshop is scheduled for 2011 to give agencies time to gain experience with the rules, to collect information for analysis at the workshop, and to identify any needed changes to improve the monitoring program. NMFS and the Navy have agreed to conduct a pre-workshop in 2010 to allow the public an opportunity to provide input and prepare for the 2011 workshop.

All of the planned workshops should lead to substantial new information related to improved mitigation strategies for military activities that would be implemented through the adaptive management provisions of the permits. Based on the information developed in these workshops, I will encourage NMFS and the Navy and other permittees to address the uncertainties identified above and to evaluate additional methods to reduce further any adverse effects on marine mammals resulting from the Navy's training exercises or other activities that may impact marine mammals or other protected resources.

In addition, NMFS included in various final rules, a requirement that the Navy develop an integrated comprehensive monitoring program, which it recently completed and will go into effect immediately. Any changes to the monitoring program will be made during workshops with NMFS and Navy. NMFS will also continue to work with the Navy to develop and implement new tools to characterize and predict areas that are important to marine mammals in the context of developing associated measures, as appropriate, to reduce impacts to marine mammals in these important areas while allowing the Navy to meet its training goals. In several rules, NMFS required the Navy to enter into a Memorandum of Agreement requiring the Navy to assist NMFS with investigations of strandings of marine mammals. NMFS is working with the Navy to complete this Agreement as soon as possible. NMFS will recommend that the Navy further focus on, develop, and implement technologies that enhance marine mammal detection capabilities (such as passive acoustic detection on instrumented ranges) to allow for both a better understanding of marine mammal activities in the presence of military training as well as, potentially, more effective implementation of mitigation measures.

Moreover, consistent with our legal and scientific mandates, I have directed NMFS to ensure thorough reviews of the Navy's after-action reports are conducted to identify opportunities for strengthening mitigation measures; to process and integrate new information from population assessments, interagency biological response studies, and other sources into its decision making framework; and to take advantage of the adaptive mechanisms in the regulations and annual authorizations to optimize the mitigation measures that are in place for protection of marine mammal species or stocks.

Finally, as part of a settlement agreement in litigation regarding the effects of sonar training on marine mammals, the Navy and the Natural Resources Defense Council (NRDC) have begun to meet and confer to resolve outstanding differences concerning marine mammal mitigation measures. NOAA participated in the first discussion, and is committed to playing an active role in future meetings. I have met with both the Navy and NRDC over the past several months, and I have developed an understanding of the issues and of their respective positions. I believe NOAA's participation will enhance these discussions, and can help to resolve the differing views among the parties. My expectation is that the parties will identify areas of scientific disagreement and uncertainty, and will engage in a healthy debate concerning how to ensure the Navy's training activities minimize, to the least practicable impact, adverse effects on marine mammal species or stocks. I also expect the Navy to be open to new ideas and approaches to mitigation that are supported by the best available science.

At this point, NOAA's review has concluded, but our work on these issues will continue. In addition to the actions outlined above, NMFS will continue to work with the Navy, and in the event specific problems are identified, NMFS will aggressively seek appropriate solutions.

Sincerely,

Jane Lubchenco, Ph.D.
Under Secretary of Commerce
for Oceans and Atmosphere

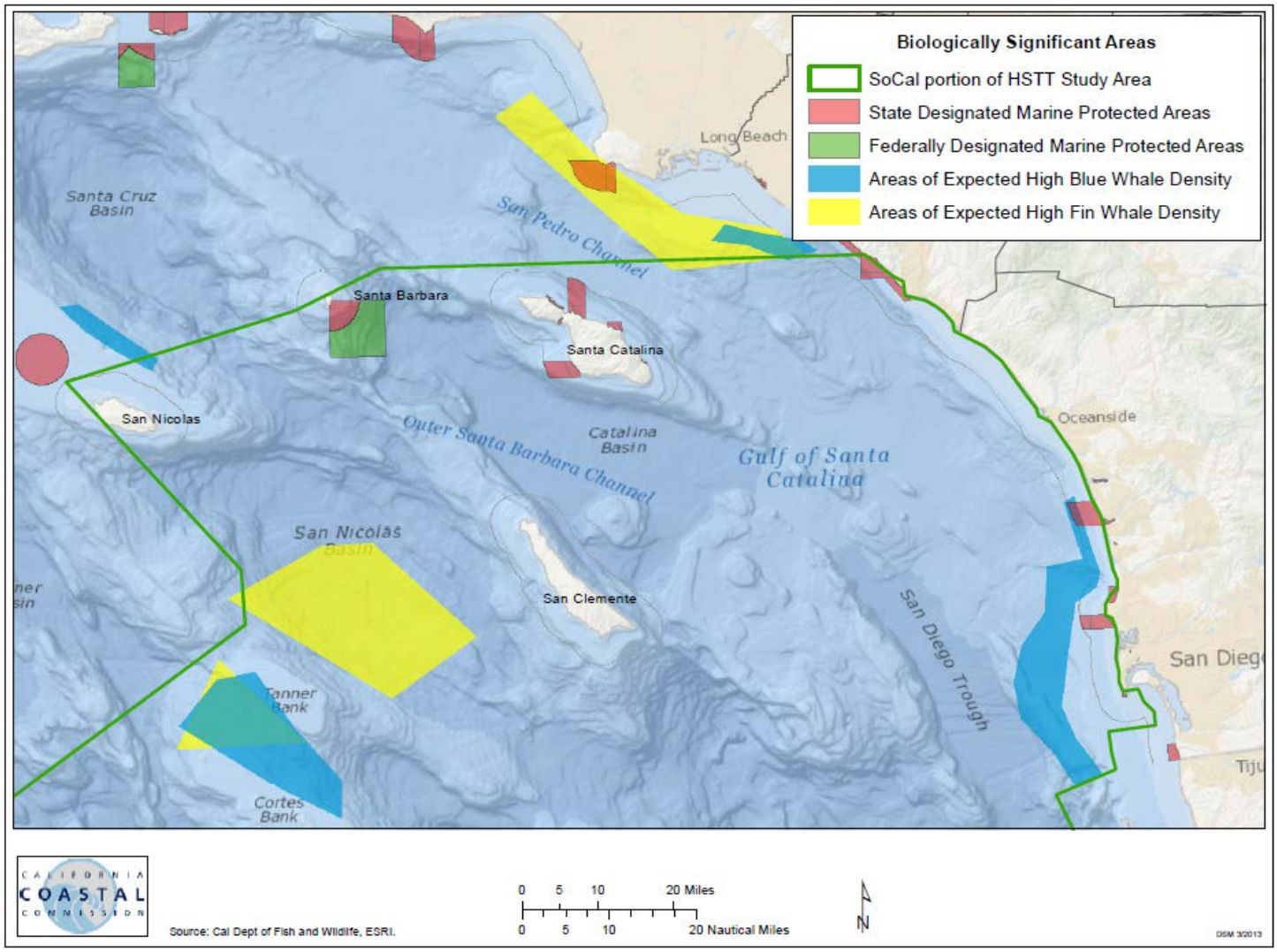


Exhibit 22
CD-008-13