TABLE 53—PROCEDURAL MITIGATION FOR SINKING EXERCISES—Continued

Procedural mitigation description
• During the activity, conduct passive acoustic monitoring and visually observe for marine mammals from the vessel; if resource is visually observed, cease firing. • Immediately after any planned or unplanned breaks in weapons firing of longer than 2 hours, observe for marine mammals from the aircraft and vessel; if resource is observed, do not commence firing. • To allow an observed marine mammal to leave the mitigation zone, the Navy will not recommence firing until one of the recommencement conditions has been met: (1) The animal is observed exiting the mitigation zone; (2) the animal is thought to have exited the mitigation zone based on a determination of its course, speed, and movement relative to the target ship hulk; or (3) the mitigation zone has been clear from any additional sightings for 30 min. • For 2 hours after sinking the vessel (or until sunset, whichever comes first), observe for marine mammals; if any injured or dead resources are observed, follow established incident reporting procedures.

Procedural Mitigation for Explosive Mine Countermeasure and Neutralization Activities

Procedural mitigation for explosive mine countermeasure and neutralization activities is described in Table 54 below.

TABLE 54—PROCEDURAL MITIGATION FOR EXPLOSIVE MINE COUNTERMEASURE AND NEUTRALIZATION ACTIVITIES

Procedural mitigation description
Stressor or Activity: • Explosive mine countermeasure and neutralization activities. *Number of Lookouts and Observation Platform:* • 1 Lookout positioned on a vessel or in an aircraft when implementing the smaller mitigation zone. • 2 Lookouts (one positioned in an aircraft and one on a small boat) when implementing the larger mitigation zone. *Mitigation Zone Size and Mitigation Requirements:* • 600 yd around the detonation site for activities using 0.1–5-lb net explosive weight, or 2,100 yd around the detonation site for 6–650 lb net explosive weight (including high explosive target mines): • Prior to the start of the activity (*e.g.*, when maneuvering on station; typically, 10 min when the activity involves aircraft that have fuel constraints, or 30 min when the activity involves aircraft that are not typically fuel constrained), observe for floating vegetation and marine mammals; if resource is observed, do not commence detonations. • During the activity, observe for marine mammals; if resource is observed, cease detonations. • To allow an observed marine mammal to leave the mitigation zone, the Navy will not recommence detonations until one of the recommencement conditions has been met: (1) The animal is observed exiting the mitigation zone; (2) the animal is thought to have exited the mitigation zone based on a determination of its course, speed, and movement relative to detonation site; or (3) the mitigation zone has been clear from any additional sightings for 10 min when the activity involves aircraft with fuel constraints, or 30 min when the activity involves aircraft that are not typically fuel constrained. • After completion of the activity, observe for marine mammals (typically 10 min when the activity involves aircraft that have fuel constraints or 30 min when the activity involves aircraft that are not typically fuel constrained); if any injured or dead resources are observed, follow established incident reporting procedures.

Procedural Mitigation for Explosive Mine Neutralization Activities Involving Navy Divers

Procedural mitigation for explosive mine neutralization activities involving Navy divers is described in Table 55 below.

TABLE 55—PROCEDURAL MITIGATION FOR EXPLOSIVE MINE NEUTRALIZATION ACTIVITIES INVOLVING NAVY DIVERS

Procedural mitigation description
Stressor or Activity: • Explosive mine neutralization activities involving Navy divers. *Number of Lookouts and Observation Platform:* • 2 Lookouts (two small boats with one Lookout each, or one Lookout on a small boat and one in a rotary-wing aircraft) when implementing the smaller mitigation zone. • 4 Lookouts (two small boats with two Lookouts each), and a pilot or member of an aircrew will serve as an additional Lookout if aircraft are used during the activity, when implementing the larger mitigation zone. *Mitigation Zone Size and Mitigation Requirements:* • The Navy will not set time-delay firing devices (0.1–29 lb net explosive weight) to exceed 10 min. • 500 yd around the detonation site during activities under positive control using 0.1–20 lb net explosive weight, or • 1,000 yd around the detonation site during all activities using time-delay fuses (0.1–29 lb net explosive weight) and during activities under positive control using 21–60 lb net explosive weight:

TABLE 55—PROCEDURAL MITIGATION FOR EXPLOSIVE MINE NEUTRALIZATION ACTIVITIES INVOLVING NAVY DIVERS—Continued

Procedural mitigation description
• Prior to the start of the activity (*e.g.*, when maneuvering on station for activities under positive control; 30 min for activities using time-delay firing devices), observe for floating vegetation and marine mammals; if resource is observed, do not commence detonations or fuse initiation. • During the activity, observe for marine mammals; if resource is observed, cease detonations or fuse initiation. • All divers placing the charges on mines will support the Lookouts while performing their regular duties and will report all sightings to their supporting small boat or Range Safety Officer. • To the maximum extent practicable depending on mission requirements, safety, and environmental conditions, boats will position themselves near the mid-point of the mitigation zone radius (but outside of the detonation plume and human safety zone), will position themselves on opposite sides of the detonation location (when two boats are used), and will travel in a circular pattern around the detonation location with one Lookout observing inward toward the detonation site and the other observing outward toward the perimeter of the mitigation zone. • If used, aircraft will travel in a circular pattern around the detonation location to the maximum extent practicable. • To allow an observed marine mammal to leave the mitigation zone, the Navy will not recommence detonations or fuse initiation until one of the recommencement conditions has been met: (1) The animal is observed exiting the mitigation zone; (2) the animal is thought to have exited the mitigation zone based on a determination of its course, speed, and movement relative to the detonation site; (3) the mitigation zone has been clear from any additional sightings for 10 min during activities under positive control with aircraft that have fuel constraints, or 30 min during activities under positive control with aircraft that are not typically fuel constrained and during activities using time-delay firing devices. • After completion of an activity using time-delay firing devices, observe for marine mammals for 30 min; if any injured or dead resources are observed, follow established incident reporting procedures.

Procedural Mitigation for Underwater Demolition Multiple Charge—Mat Weave and Obstacle Loading

Procedural mitigation for underwater demolition multiple charge—mat weave and obstacle Loading is described in Table 56 below.

TABLE 56—PROCEDURAL MITIGATION FOR UNDERWATER DEMOLITION MULTIPLE CHARGE—MAT WEAVE AND OBSTACLE LOADING

Procedural mitigation description
Stressor or Activity: • Underwater Demolition Multiple Charge—Mat Weave and Obstacle Loading exercises. *Number of Lookouts and Observation Platform:* • 2 Lookouts (one on a small boat and one on shore from an elevated platform). *Mitigation Zone Size and Mitigation Requirements:* • 700 yd around the detonation site: • For 30 min prior to the first detonation, the Lookout positioned on a small boat will observe for floating vegetation and marine mammals; if resource is observed, do not commence the initial detonation. • For 10 min prior to the first detonation, the Lookout positioned on shore will use binoculars to observe for marine mammals; if resource is observed, do not commence the initial detonation until the mitigation zone has been clear of any additional sightings for a minimum of 10 min. • During the activity, observe for marine mammals; if resource is observed, cease detonations. • To allow an observed marine mammal to leave the mitigation zone, the Navy will not recommence detonations until one of the recommencement conditions has been met: (1) The animal is observed exiting the mitigation zone; (2) the animal is thought to have exited the mitigation zone based on a determination of its course, speed, and movement relative to the detonation site; or (3) the mitigation zone has been clear from any additional sightings for 10 min (as determined by the shore observer). • After completion of the activity, the Lookout positioned on a small boat will observe for marine mammals for 30 min; if any injured or dead resources are observed, follow established incident reporting procedures.

Procedural Mitigation for Maritime Security Operations—Anti-Swimmer Grenades

Procedural mitigation for maritime security operations—anti-swimmer grenades is described in Table 57 below.

TABLE 57—PROCEDURAL MITIGATION FOR MARITIME SECURITY OPERATIONS—ANTI-SWIMMER GRENADES

Procedural mitigation description
Stressor or Activity: • Maritime Security Operations—Anti-Swimmer Grenades.

TABLE 57—PROCEDURAL MITIGATION FOR MARITIME SECURITY OPERATIONS—ANTI-SWIMMER GRENADES—Continued

Procedural mitigation description

Number of Lookouts and Observation Platform:
• 1 Lookout positioned on the small boat conducting the activity.
Mitigation Zone Size and Mitigation Requirements:
• 200 yd around the intended detonation location:
  • Prior to the start of the activity (*e.g.*, when maneuvering on station), observe for floating vegetation and marine mammals; if resource is observed, do not commence detonations.
  • During the activity, observe for marine mammals; if resource is observed, cease detonations.
  • To allow an observed marine mammal to leave the mitigation zone, the Navy will not recommence detonations until one of the re-commencement conditions has been met: (1) The animal is observed exiting the mitigation zone; (2) the animal is thought to have exited the mitigation zone based on a determination of its course, speed, and movement relative to the intended detonation location; (3) the mitigation zone has been clear from any additional sightings for 30 min; or (4) the intended detonation location has transited a distance equal to double that of the mitigation zone size beyond the location of the last sighting.

Procedural Mitigation for Physical Disturbance and Strike Stressors

Mitigation measures for physical disturbance and strike stressors are provided in Table 58 through Table 62.

Procedural Mitigation for Vessel Movement

Procedural mitigation for vessel movement is described in Table 58 below.

TABLE 58—PROCEDURAL MITIGATION FOR VESSEL MOVEMENT

Procedural mitigation description

Stressor or Activity:
• Vessel movement.
• The mitigation will not be applied if (1) the vessel's safety is threatened, (2) the vessel is restricted in its ability to maneuver (*e.g.*, during launching and recovery of aircraft or landing craft, during towing activities, when mooring, etc.), (3) the vessel is operated autonomously, or (4) when impracticable based on mission requirements (*e.g.*, during Amphibious Assault—Battalion Landing exercises).
Number of Lookouts and Observation Platform:
• 1 Lookout on the vessel that is underway.
Mitigation Zone Size and Mitigation Requirements:
• 500 yd around whales:
  • When underway, observe for marine mammals; if a whale is observed, maneuver to maintain distance.
• 200 yd around all other marine mammals (except bow-riding dolphins and pinnipeds hauled out on man-made navigational structures, port structures, and vessels):
  • When underway, observe for marine mammals; if a marine mammal other than a whale, bow-riding dolphin, or hauled-out pinniped is observed, maneuver to maintain distance.

Procedural Mitigation for Towed In-Water Devices

Procedural mitigation for towed in-water devices is described in Table 59 below.

TABLE 59—PROCEDURAL MITIGATION FOR TOWED IN-WATER DEVICES

Procedural mitigation description
Stressor or Activity: • Towed in-water devices. • Mitigation applies to devices that are towed from a manned surface platform or manned aircraft. • The mitigation will not be applied if the safety of the towing platform or in-water device is threatened. *Number of Lookouts and Observation Platform:* • 1 Lookout positioned on the manned towing platform. *Mitigation Zone Size and Mitigation Requirements:* • 250 yd around marine mammals: • During the activity, observe for marine mammals; if resource is observed, maneuver to maintain distance.

Procedural Mitigation for Small-, Medium-, and Large-Caliber Non-Explosive Practice Munitions

Procedural mitigation for small-, medium-, and large-caliber non-explosive practice munitions is described in Table 60 below.

TABLE 60—PROCEDURAL MITIGATION FOR SMALL-, MEDIUM-, AND LARGE-CALIBER NON-EXPLOSIVE PRACTICE MUNITIONS

Procedural mitigation description
Stressor or Activity: • Gunnery activities using small-, medium-, and large-caliber non-explosive practice munitions. • Mitigation applies to activities using a surface target. *Number of Lookouts and Observation Platform:* • 1 Lookout positioned on the platform conducting the activity. • Depending on the activity, the Lookout could be the same as the one described in Table 47 (Procedural Mitigation for Weapons Firing Noise). *Mitigation Zone Size and Mitigation Requirements:* • 200 yd around the intended impact location: • Prior to the start of the activity (*e.g.*, when maneuvering on station), observe for floating vegetation and marine mammals; if resource is observed, do not commence firing. • During the activity, observe for marine mammals; if resource is observed, cease firing. • To allow an observed marine mammal to leave the mitigation zone, the Navy will not recommence firing until one of the re-commencement conditions has been met: (1) The animal is observed exiting the mitigation zone; (2) the animal is thought to have exited the mitigation zone based on a determination of its course, speed, and movement relative to the intended impact location; (3) the mitigation zone has been clear from any additional sightings for 10 min for aircraft-based firing or 30 min for vessel-based firing; or (4) for activities using a mobile target, the intended impact location has transited a distance equal to double that of the mitigation zone size beyond the location of the last sighting.

Procedural Mitigation for Non-Explosive Missiles and Rockets

Procedural mitigation for non-explosive missiles and rockets is described in Table 61 below.

TABLE 61—PROCEDURAL MITIGATION FOR NON-EXPLOSIVE MISSILES AND ROCKETS

Procedural mitigation description
Stressor or Activity: • Aircraft-deployed non-explosive missiles and rockets. • Mitigation applies to activities using a surface target. *Number of Lookouts and Observation Platform:* • 1 Lookout positioned in an aircraft. *Mitigation Zone Size and Mitigation Requirements:* • 900 yd around the intended impact location: • Prior to the start of the activity (*e.g.*, during a fly-over of the mitigation zone), observe for floating vegetation and marine mammals; if resource is observed, do not commence firing. • During the activity, observe for marine mammals; if resource is observed, cease firing. • To allow an observed marine mammal to leave the mitigation zone, the Navy will not recommence firing until one of the re-commencement conditions has been met: (1) The animal is observed exiting the mitigation zone; (2) the animal is thought to have exited the mitigation zone based on a determination of its course, speed, and movement relative to the intended impact location; or (3) the mitigation zone has been clear from any additional sightings for 10 min when the activity involves aircraft that have fuel constraints, or 30 min when the activity involves aircraft that are not typically fuel constrained.

Procedural Mitigation for Non-Explosive Bombs and Mine Shapes

Procedural mitigation for non-explosive bombs and mine shapes is described in Table 62 below.

TABLE 62—PROCEDURAL MITIGATION FOR NON-EXPLOSIVE BOMBS AND MINE SHAPES

Procedural mitigation description
Stressor or Activity: • Non-explosive bombs. • Non-explosive mine shapes during mine laying activities. *Number of Lookouts and Observation Platform:* • 1 Lookout positioned in an aircraft. *Mitigation Zone Size and Mitigation Requirements:* • 1,000 yd around the intended target: • Prior to the start of the activity (*e.g.*, when arriving on station), observe for floating vegetation and marine mammals; if resource is observed, do not commence bomb deployment or mine laying. • During approach of the target or intended minefield location, observe for marine mammals; if resource is observed, cease bomb deployment or mine laying.

TABLE 62—PROCEDURAL MITIGATION FOR NON-EXPLOSIVE BOMBS AND MINE SHAPES—Continued

Procedural mitigation description
• To allow an observed marine mammal to leave the mitigation zone, the Navy will not recommence bomb deployment or mine laying until one of the recommencement conditions has been met: (1) The animal is observed exiting the mitigation zone; (2) the animal is thought to have exited the mitigation zone based on a determination of its course, speed, and movement relative to the intended target or minefield location; (3) the mitigation zone has been clear from any additional sightings for 10 min; or (4) for activities using mobile targets, the intended target has transited a distance equal to double that of the mitigation zone size beyond the location of the last sighting.

Mitigation Areas

In addition to procedural mitigation, the Navy will implement mitigation measures within mitigation areas to avoid or minimize potential impacts on marine mammals (see the revised Figures provided in the Navy's addendum to the application). A full technical analysis (for which the methods were summarized above) of the mitigation areas that the Navy considered for marine mammals is provided in Appendix K (Geographic Mitigation Assessment) of the HSTT DEIS/OEIS. The Navy has taken into account public comments received from the HSTT DEIS/OEIS, best available science, and the practicability of implementing additional mitigations and has enhanced their mitigation areas and mitigation measures to further reduce impacts to marine mammals, and therefore, the Navy revised their mitigation areas since their application. These revisions are discussed below and can be found as an addendum to the Navy's application at *https://www.fisheries.noaa.gov/national/marine-mammal-protection/incidental-take-authorizations-military-readiness-activities*. The Navy will continue to work with NMFS to finalize its mitigation areas through the development of the rule.

Information on the mitigation measures that the Navy will implement within mitigation areas is provided in Tables 63 and 64. The mitigation applies year-round unless specified otherwise in the tables.

Mitigation Areas for the HRC

Mitigation areas for the HRC are described in Table 63 below. The location of each mitigation area is in the Navy's addendum to the application on Mitigation Areas.

TABLE 63—MITIGATION AREAS FOR MARINE MAMMALS IN THE HAWAII RANGE COMPLEX

Mitigation area description
Stressor or Activity:
Sonar.
Explosives.[1]
Vessel strikes.
Resource Protection Focus:
Marine mammals
Mitigation Area Requirements:
Hawaii Island Mitigation Area (year-round):
• The Navy will minimize the use of mid-frequency active anti-submarine warfare sensor bins MF1 and MF4 to the maximum extent practicable.
• The Navy will not conduct more than 300 hrs of MF1 and 20 hrs of MF4 per year.
• Should national security present a requirement to conduct more than 300 hrs of MF1 or 20 hrs of MF4 per year, naval units will obtain permission from the appropriate designated Command authority prior to commencement of the activity. The Navy will provide NMFS with advance notification and include the information (*e.g.*, hours of sonar usage) in its annual activity reports.
• The Navy will not use explosives [1] during training and testing.
• Should national security present a requirement for the use of explosives in the area, naval units will obtain permission from the appropriate designated Command authority prior to commencement of the activity. The Navy will provide NMFS with advance notification and include the information (*e.g.*, explosives usage) in its annual activity reports.
4-Islands Region Mitigation Area (November 15–April 15):
• The Navy will not use mid-frequency active anti-submarine warfare sensor MF1 from November 15–April 15.
• Should national security present a requirement for the use of MF1 in the area from November 15–April 15, naval units will obtain permission from the appropriate designated Command authority prior to commencement of the activity. The Navy will provide NMFS with advance notification and include the information (*e.g.*, hours of sonar usage) in its annual activity reports.
Humpback Whale Special Reporting Areas (December 15–April 15):
• The Navy will report the hours of MF1 used in the special reporting areas in its annual activity reports.
Humpback Whale Awareness Notification Message Area (November 1–April 30):
• The Navy will issue a seasonal awareness notification message to alert ships and aircraft operating in the area to the possible presence of concentrations of large whales, including humpback whales.
• To maintain safety of navigation and to avoid interactions with large whales during transits, the Navy will instruct vessels to remain vigilant to the presence of large whale species (including humpback whales), that when concentrated seasonally, may become vulnerable to vessel strikes.
• Lookouts will use the information from the awareness notification message to assist their visual observation of applicable mitigation zones during training and testing activities and to aid in the implementation of procedural mitigation.

Notes:
[1] Explosive restrictions for the Hawaii Island Mitigation Area apply only to those activities for which the Navy seeks MMPA authorization (*e.g.*, surface-to-surface or air-to-surface missile and gunnery events, BOMBEX, and mine neutralization).

Mitigation Areas for the SOCAL Portion of the Study Area

Mitigation areas for the SOCAL portion of the Study Area are described in Table 64 below. The location of each mitigation area is shown in the Navy's addendum to the application on Mitigation Areas.

TABLE 64—MITIGATION AREAS FOR MARINE MAMMALS IN THE SOUTHERN CALIFORNIA PORTION OF THE STUDY AREA

Mitigation area description
Stressor or Activity:
Sonar.
Explosives.
Vessel strikes.
Resource Protection Focus:
Marine mammals.
Mitigation Area Requirements:
San Diego Arc Mitigation Area (June 1–October 31):
• The Navy will minimize the use of mid-frequency active anti-submarine warfare sensor bin MF1 to the maximum extent practicable.
• The Navy will not conduct more than 200 hrs of MF1 (with the exception of active sonar maintenance and systems checks) per year from June 1–October 31.
• Should national security present a requirement to conduct more than 200 hrs of MF1 (with the exception of active sonar maintenance and systems checks) per year from June 1–October 31, naval units will obtain permission from the appropriate designated Command authority prior to commencement of the activity. The Navy will provide NMFS with advance notification and include the information (*e.g.*, hours of sonar usage) in its annual activity reports.
• The Navy will not use explosives during large-caliber gunnery, torpedo, bombing, and missile (including 2.75 in rockets) activities during training and testing.
• Should national security present a requirement to conduct large-caliber gunnery, torpedo, bombing, and missile (including 2.75 in rockets) activities using explosives, naval units will obtain permission from the appropriate designated Command authority prior to commencement of the activity. The Navy will provide NMFS with advance notification and include the information (*e.g.*, explosives usage) in its annual activity reports.
Santa Barbara Island Mitigation Area (year-round):
• The Navy will not use mid-frequency active anti-submarine warfare sensor MF1 and explosives in small-, medium-, and large-caliber gunnery; torpedo; bombing; and missile (including 2.75 in rockets) activities during unit-level training and major training exercises.
• Should national security present a requirement for the use of mid-frequency active anti-submarine warfare sensor MF1 or explosives in small-, medium-, and large-caliber gunnery; torpedo; bombing; and missile (including 2.75 in rockets) activities during unit-level training or major training exercises for national security, naval units will obtain permission from the appropriate designated Command authority prior to commencement of the activity. The Navy will provide NMFS with advance notification and include the information in its annual activity reports.
Blue Whale (June 1–October 31), Gray Whale (November 1–March 31), and Fin Whale (November 1–May 31) Awareness Notification Message Areas:
• The Navy will issue a seasonal awareness notification message to alert ships and aircraft operating in the area to the possible presence of concentrations of large whales, including blue, gray, or fin whales.
• To maintain safety of navigation and to avoid interactions with large whales during transits, the Navy will instruct vessels to remain vigilant to the presence of large whale species, that when concentrated seasonally, may become vulnerable to vessel strikes.
• Lookouts will use the information from the awareness notification messages to assist their visual observation of applicable mitigation zones during training and testing activities and to aid in the implementation of procedural mitigation.

NMFS conducted an independent analysis of the mitigation areas that the Navy proposed, which are described below. NMFS concurs with the Navy's analysis, which indicates that the measures in these mitigation areas are both practicable (which is the Navy's purview to determine) and will reduce the likelihood or severity of adverse impacts to marine mammal species or stocks or their habitat in the manner described in the Navy's analysis. Specifically, the mitigation areas will provide the following benefits to the affected stocks:

4-Islands Region Mitigation Area (Seasonal Nov 15–Apr 15): The Maui/Molokai area (4-Islands Region) is an important reproductive and calving area for humpback whales. Recent scientific research indicates peak humpback whale season has expanded, with higher densities of whales occurring earlier than prior studies had indicated. In addition, a portion of this area has also been identified as biologically important for the ESA-listed small and resident population, main Hawaiian Island insular false killer whales. While the season for this area used to be from December 15 to April 15, the Navy has proposed to extend it from November 15 to April 15. Extending the season and size of the 4-Islands Region Mitigation Area will provide some added protection for that species during half of the year. Minimizing impacts in this area and time is expected to reduce the likelihood of more serious impacts from sonar that could interfere with important cow/calf communication or have unforeseen impacts on more sensitive calves. This area also overlaps with identified biologically important areas for other marine mammal species such as dolphin species including Common bottlenose dolphin, pantropical spotted dolphin, and spinner dolphin (small and resident populations).

Hawaii Island Mitigation Area (Year-round): The endangered main Hawaiian Island insular false killer whale, which is a small and resident populations, and two species of beaked whales (Cuvier and Blainville's) have been documented using this area year-round to support multiple biological functions. Main Hawaiian Island insular false killer whales are an endangered species and beaked whales are scientifically shown to be highly sensitive to exposure to sonar. This area also overlaps with other identified biologically important areas for other marine mammal species such as humpback whale (important reproductive/calving area), dwarf sperm whale (small and resident populations), pygmy killer whale (small and resident

population), melon-headed whale (small and resident population), short-finned pilot whale (small and resident population) and dolphin species including Common bottlenose dolphin, pantropical spotted dolphin, spinner dolphin, and rough-toothed dolphin (small and resident populations) for which the Hawaii Island Mitigation Area would provide additional protection.

Potential benefits to humpback whales are noted in the section above. For beaked whales, which have been shown to be more sensitive to loud sounds, a reduction of impacts in general where the stock is known to live or concentrate is expected to reduce the likelihood that more severe responses that could affect individual fitness would occur. For small resident populations, one goal is to ensure that the entirety of any small population is not being extensively impacted, in order to reduce the probability that repeated behavioral exposures to small numbers of individuals will result in energetic impacts, or other impacts with the potential to reduce survival or reproductive success on individuals that will more readily accrue to population level impacts in smaller stocks.

Santa Barbara Island Mitigation Area (Year-round): Numerous marine mammal species use the Channel Islands NMS and it provides valuable, and protected, marine mammal habitat. Particularly, this mitigation area will overlap with identified biologically important feeding area for blue whales and migration areas for gray whales. Generally, a reduction of impacts in the Santa Barbara Island Mitigation Area (inclusive of a portion of the Channel Islands NMS) is expected to reduce stressors in an area that likely contains high value habitat that is more typically free of other anthropogenic stressors.

San Diego Arc Mitigation Area (Seasonal Jun 1–Oct 31): Endangered blue whales have been documented foraging in this area seasonally. Reducing harassing exposures of marine mammals to sonar and explosives in feeding areas, even when the animals have demonstrated some tolerance for disturbance when in a feeding state, is expected to reduce the likelihood that feeding would be interrupted to a degree that energetic reserves might be affected in a manner that could reduce survivorship or reproductive success. This mitigation area will also partially overlap with an important migration area for gray whales.

Summary of Mitigation

The Navy's proposed mitigation measures are summarized in Tables 65 and 66.

Summary of Procedural Mitigation

A summary of procedural mitigation is described in Table 65 below.

TABLE 65—SUMMARY OF PROCEDURAL MITIGATION

Stressor or activity	Summary of mitigation requirements
Environmental Awareness and Education	Afloat Environmental Compliance Training program for applicable personnel.
Active Sonar (depending on system)	Depending on sonar source: 1,000 yd power down, 500 yd power down, and 200 yd shut down or 200 yd shut down.
Air Guns	150 yd.
Pile Driving	100 yd.
Weapons Firing Noise	30 degrees on either side of the firing line out to 70 yd.
Explosive Sonobuoys	600 yd.
Explosive Torpedoes	2,100 yd.
Explosive Medium-Caliber and Large-Caliber Projectiles	1,000 yd (large-caliber projectiles); 600 yd (medium-caliber projectiles during surface-to-surface activities) or 200 yd (medium-caliber projectiles during air-to-surface activities).
Explosive Missiles and Rockets	900 yd (0.6–20 lb net explosive weight) or 2,000 yd (21–500 lb net explosive weight).
Explosive Bombs	2,500 yd.
Sinking Exercises	2.5 nmi.
Explosive Mine Countermeasure and Neutralization Activities	600 yd (0.1–5 lb net explosive weight) or 2,100 yd (6–650 lb net explosive weight).
Explosive Mine Neutralization Activities Involving Navy Divers	500 yd (0.1–20 lb net explosive weight for positive control charges), or 1,000 yd (21–60 lb net explosive weight for positive control charges and all charges using time-delay fuses).
Underwater Demolition Multiple Charge—Mat Weave and Obstacle Loading.	700 yd.
Maritime Security Operations—Anti-Swimmer Grenades	200 yd.
Vessel Movement	500 yd (whales) or 200 yd (other marine mammals).
Towed In-Water Devices	250 yd.
Small-, Medium-, and Large-Caliber Non-Explosive Practice Munitions.	200 yd.
Non-Explosive Missiles and Rockets	900 yd.
Non-Explosive Bombs and Mine Shapes	1,000 yd.

Summary of Mitigation Areas

A summary of mitigation areas for marine mammals is described in Table 66 below.

TABLE 66—SUMMARY OF MITIGATION AREAS FOR MARINE MAMMALS

Mitigation area	Summary of mitigation requirements
Mitigation Areas for Marine Mammals	
Hawaii Island Mitigation Area (Year-round).	• The Navy would not exceed 300 hrs of mid-frequency active anti-submarine warfare sensor MF1 and 20 hrs of mid-frequency active anti-submarine warfare sensor MF4 per season annually. • Should national security present a requirement to conduct additional training and testing using MF1 or MF4 in the mitigation area for national security, naval units will obtain permission from the appropriate designated Command authority prior to commencement of the activity. The Navy will provide NMFS with advance notification and include the information in associated reports. • The Navy will not use explosives [1] during training or testing activities. • Should national security present a requirement to use explosives, naval units will obtain permission from the appropriate designated Command authority prior to commencement of the activity. The Navy will provide NMFS with advance notification and include the information in associated annual reports.
4-Islands Region Mitigation Area (November 15–April 15).	• The Navy will not use mid-frequency active anti-submarine warfare sensor MF1 during training or testing activities. • Should national security present a requirement to use MF1 during training or testing, naval units will obtain permission from the appropriate designated Command authority prior to commencement of the activity. The Navy will provide NMFS with advance notification and include the information in associated annual reports.
San Diego Arc Mitigation Area (June 1–October 31).	• The Navy would not exceed 200 hrs of mid-frequency active anti-submarine warfare sensor MF1 (with the exception of active sonar maintenance and systems checks) annually within the area. • Should national security present a requirement to conduct additional training and testing using MF1, naval units will obtain permission from the appropriate designated Command authority prior to commencement of the activity. The Navy will provide NMFS with advance notification and include the information in associated annual reports. • The Navy will not use explosives during large-caliber gunnery, torpedo, bombing, and missile (including 2.75 in rockets) activities during training or testing activities. • Should national security present a requirement to use these explosives during training or testing activities, naval units will obtain permission from the appropriate designated Command authority prior to commencement of the activity. The Navy will provide NMFS with advance notification and include the information in associated annual reports.
Santa Barbara Island Mitigation Area (Year-round).	• The Navy will not use mid-frequency active anti-submarine warfare sensor MF1 and explosives in small-, medium-, and large-caliber gunnery; torpedo; bombing; and missile (including 2.75 in rockets) activities during unit-level training or major training exercises. • Should national security present a requirement to use MF1 or these explosives during training or testing activities, naval units will obtain permission from the appropriate designated Command authority prior to commencement of the activity. The Navy will provide NMFS with advance notification and include the information in associated annual reports.

Notes:
[1] Explosive restrictions within the Hawaii Island Mitigation Area apply only to those activities for which the Navy seeks MMPA authorization (*e.g.*, surface-to-surface or air-to-surface missile and gunnery events, BOMBEX, and mine neutralization).

Mitigation Conclusions

NMFS has carefully evaluated the Navy's proposed mitigation measures—many of which were developed with NMFS's input during the previous phases of Navy training and testing authorizations—and considered a broad range of other measures (*i.e.*, the measures considered but eliminated in the Navy's DEIS/OEIS, which reflect many of the comments that have arisen via NMFS or public input in past years) in the context of ensuring that NMFS prescribes the means of effecting the least practicable adverse impact on the affected marine mammal species and stocks and their habitat. Our evaluation of potential measures included consideration of the following factors in relation to one another: The manner in which, and the degree to which, the successful implementation of the mitigation measures is expected to reduce the likelihood and/or magnitude of adverse impacts to marine mammal species and stocks and their habitat; the proven or likely efficacy of the measures; and the practicability of the measures for applicant implementation, including consideration of personnel safety, practicality of implementation, and impact on the effectiveness of the military readiness activity.

Based on our evaluation of the Navy's proposed measures, as well as other measures considered by the Navy and NMFS, NMFS has preliminarily determined that the Navy's proposed mitigation measures are adequate means of effecting the least practicable adverse impacts on marine mammals species or stocks and their habitat, paying particular attention to rookeries, mating grounds, and areas of similar significance, while also considering personnel safety, practicality of implementation, and impact on the effectiveness of the military readiness activity. Additionally, the adaptive management component helps further ensure that mitigation is regularly assessed and opportunities are available to improve the mitigation, based on the factors above, through modification as appropriate. The proposed rule comment period provides the public an opportunity to submit recommendations, views, and/or concerns regarding the proposed mitigation measures. While NMFS has preliminarily determined that the Navy's proposed mitigation measures would effect the least practicable adverse impact on the affected species or stocks and their habitat, NMFS will consider all public comments to help inform our final decision. Consequently, the proposed mitigation measures may be refined, modified, removed, or added to prior to the issuance of any final rule based on public comments received, and where appropriate, further analysis of any additional mitigation measures.

Proposed Monitoring

Section 101(a)(5)(A) of the MMPA states that in order to issue an ITA for an activity, NMFS must set forth "requirements pertaining to the monitoring and reporting of such taking." The MMPA implementing regulations at 50 CFR 216.104(a)(13) indicate that requests for LOAs must include the suggested means of accomplishing the necessary monitoring and reporting that will result in increased knowledge of the species and of the level of taking or impacts on populations of marine mammals that are expected to be present.

Although the Navy has been conducting research and monitoring in the HSTT Study Area for over 20 years, they developed a formal marine species monitoring program in support of the MMPA and ESA authorizations for the Hawaii and Southern California range complexes in 2009. This robust program has resulted in hundreds of technical reports and publications on marine mammals that have informed Navy and NMFS analysis in environmental planning documents, Rules and Biological Opinions. The reports are made available to the public on the Navy's marine species monitoring website (*www.navymarinespecies monitoring.us*) and the data on the Ocean Biogeographic Information System Spatial Ecological Analysis of Megavertebrate Populations (OBIS–SEAMAP) (*www.seamap.env.duke.edu*).

The Navy would continue collecting monitoring data to inform our understanding of: The occurrence of marine mammals in the action area; the likely exposure of marine mammals to stressors of concern in the area; the response of marine mammals to exposures to stressors; the consequences of a particular marine mammal response to their individual fitness and, ultimately, populations; and, the effectiveness of implemented mitigation measures. Taken together, mitigation and monitoring comprise the Navy's integrated approach for reducing environmental impacts from the specified activities. The Navy's overall monitoring approach will seek to leverage and build on existing research efforts whenever possible.

Consistent with the cooperating agency agreement between the Navy and NMFS, monitoring measures presented here, as well as the mitigation measures described above, focus on the protection and management of potentially affected marine mammals. A well-designed monitoring program can provide important feedback for validating assumptions made in analyses and allow for adaptive management of marine resources. Monitoring is required under the MMPA, and details of the monitoring program for the specified activities have been developed through coordination between NMFS and the Navy through the regulatory process for previous Navy at-sea training and testing actions. Input received during the public comment period and discussions with other agencies or NMFS offices during the rulemaking process could result in changes to the monitoring as described in this document.

Integrated Comprehensive Monitoring Program (ICMP)

The Navy's ICMP is intended to coordinate marine species monitoring efforts across all regions and to allocate the most appropriate level and type of effort for each range complex based on a set of standardized objectives, and in acknowledgement of regional expertise and resource availability. The ICMP is designed to be flexible, scalable, and adaptable through the adaptive management and strategic planning processes to periodically assess progress and reevaluate objectives. This process includes conducting an annual adaptive management review meeting, at which the Navy and NMFS jointly consider the prior-year goals, monitoring results, and related scientific advances to determine if monitoring plan modifications are warranted to more effectively address program goals. Although the ICMP does not specify actual monitoring field work or individual projects, it does establish a matrix of goals and objectives that have been developed in coordination with NMFS. As the ICMP is implemented through the Strategic Planning Process, detailed and specific studies will be developed which support the Navy's and NMFS top-level monitoring goals. In essence, the ICMP directs that monitoring activities relating to the effects of Navy training and testing activities on marine species should be designed to contribute towards one or more of the following top-level goals:

- An increase in understanding of the likely occurrence of marine mammals and/or ESA-listed marine species in the vicinity of the action (*i.e.*, presence, abundance, distribution, and/or density of species);
- An increase in understanding of the nature, scope, or context of the likely exposure of marine mammals and/or ESA-listed species to any of the potential stressor(s) associated with the action (*e.g.*, sound, explosive detonation, or military expended materials), through better understanding of one or more of the following: (1) The action and the environment in which it occurs (*e.g.*, sound source characterization, propagation, and ambient noise levels); (2) the affected species (*e.g.*, life history or dive patterns); (3) the likely co-occurrence of marine mammals and/or ESA-listed marine species with the action (in whole or part), and/or; (4) the likely biological or behavioral context of exposure to the stressor for the marine mammal and/or ESA-listed marine species (*e.g.*, age class of exposed animals or known pupping, calving or feeding areas);
- An increase in understanding of how individual marine mammals or ESA-listed marine species respond (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 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 individual; or (2) the population, species, or stock (*e.g.*, through effects on annual rates of recruitment or survival);
- An increase in 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 mitigation 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.

Strategic Planning Process for Marine Species Monitoring

The Navy also developed the Strategic Planning Process for Marine Species Monitoring, which establishes the guidelines and processes necessary to develop, evaluate, and fund individual projects based on objective scientific study questions. The process uses an underlying framework designed around the ICMP's top-level goals, and a conceptual framework incorporating a progression of knowledge, spanning occurrence, exposure, response, and consequences. The Strategic Planning Process for Marine Species Monitoring is used to set overarching intermediate

scientific objectives, develop individual monitoring project concepts, identify potential species of interest at a regional scale, evaluate, prioritize and select specific monitoring projects to fund or continue supporting for a given fiscal year, execute and manage selected monitoring projects, and report and evaluate progress and results. This process addresses relative investments to different range complexes based on goals across all range complexes, and monitoring leverages multiple techniques for data acquisition and analysis whenever possible. The Strategic Planning Process for Marine Species Monitoring is also available online (*http://www.navymarinespeciesmonitoring.us/*).

Monitoring Progress in the Study Area

The monitoring program has undergone significant changes that highlight its evolution through the process of adaptive management. The monitoring program developed for the first cycle of environmental compliance documents (*e.g.*, (U.S. Department of the Navy, 2008)) utilized effort-based compliance metrics that were somewhat limiting. Through adaptive management discussions, the Navy designed and conducted monitoring studies according to scientific objectives, thereby eliminating basing requirements upon metrics of level-of-effort. Furthermore, refinements of scientific objective have continued through the latest permit cycle through 2018.

Progress has also been made on the monitoring program's conceptual framework categories from the Scientific Advisory Group for Navy Marine Species Monitoring (U.S. Department of the Navy, 2011e), ranging from occurrence of animals, to their exposure, response, and population consequences. Lessons-learned with Phase I and II monitoring in HRC and SOCAL suggested that "layering" multiple components of monitoring simultaneously provides a way to leverage an increase in return of the progress toward answering scientific monitoring questions.

Specific Phase II monitoring has included:

- HRC
  - Long-term Trends in Abundance of Marine Mammals at PMRF;
  - Estimation of Received Levels of Mid-Frequency Active Sonar on Marine Mammals at PMRF;
  - Behavioral Response of Marine Mammals to Navy Training and Testing at PMRF; and
  - Navy Civilian Marine Mammal Observers on MFAS Ships in Offshore Waters of HRC.
- SOCAL
  - Blue and Fin Whale Satellite Tagging;
  - Cuvier's Beaked Whale Impact Assessment at the Southern California Offshore Antisubmarine Warfare Range (SOAR);
  - Cuvier's Beaked Whale, Blue Whale, and Fin Whale Impact Assessments at Non-Instrumented Range Locations in SOCAL; and
  - Marine Mammal Sightings during California Cooperative Oceanic Fisheries Investigation (CalCOFI) Cruises.

Numerous publications, dissertations and conference presentations have resulted from research conducted under the Navy's marine species monitoring program (*https://www.navymarinespeciesmonitoring.us/reading-room/publications/*), resulting in a significant contribution to the body of marine mammal science. Publications on occurrence, distribution and density have fed the modeling input, and publications on exposure and response have informed Navy and NMFS analyses of behavioral response and consideration of mitigation measures.

Furthermore, collaboration between the monitoring program and the Navy's research and development (*e.g.*, the Office of Naval Research) and demonstration-validation (*e.g.*, Living Marine Resources) programs has been strengthened, leading to research tools and products that have already transitioned to the monitoring program. These include Marine Mammal Monitoring on Ranges (M3R), controlled exposure experiment behavioral response studies (CEE BRS), acoustic sea glider surveys, and global positioning system-enabled satellite tags. Recent progress has been made with better integration of monitoring across all Navy at-sea study areas, including study areas in the Pacific and the Atlantic Oceans, and various testing ranges. Publications from the Living Marine Resources and Office of Naval Research programs have also resulted in significant contributions to hearing, acoustic criteria used in effects modeling, exposure, and response, as well as developing tools to assess biological significance (*e.g.*, population-level consequences).

NMFS and Navy also consider data collected during procedural mitigations as monitoring. Data are collected by shipboard personnel on hours spent training, hours of observation, hours of sonar, marine mammals observed within the mitigation zone during Major Training Exercises when mitigations are implemented. These data are provided to NMFS in both classified and unclassified annual exercise reports.

Past and Current Monitoring in the Study Area

NMFS has received multiple years' worth of annual exercise and monitoring reports addressing active sonar use and explosive detonations within the HSTT Study Area and other Navy range complexes. 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/military.htm* and *http://www.navymarinespeciesmonitoring.us*.

The Navy has been funding various marine mammal studies and research within the HSTT Study Area for the past 20 years. Under permitting from NMFS starting in 2009, this effort has transitioned from a specific metric based approach, to a broader new research only approach (*e.g.*, set number of visual surveys, specific number of passive acoustic recording devices, etc.), and more recently since 2014 a more regional (Hawaii or Southern California) species-specific study question design (*e.g.*, what is distribution of species A within the HSTT Study Area, what is response of species B to Navy activities, etc.).

In adaptive management consultation with NMFS, some variation of these ongoing studies or proposed new studies will continue within the HSTT Study Area for either the duration of any new regulations, or for a set period as specified in a given project's scope. Some projects may only require one or two years of field effort. Other projects could entail multi-year field efforts (two to five years). For instance, in the SOCAL portion of the HSTT Study Area, the Navy has funded development and application of new passive acoustic technology since the early 2000's for detecting Cuvier's beaked whales. This also includes ongoing effort to further identify and update population demographics for Cuvier's beaked whales (re-sighting rates, population growth, calving rates, movements, etc.) specific to Navy training and testing areas, as well as responses to Navy activity. Variations of these Cuvier's beaked whale monitoring studies will likely continue under future authorizations. The Navy's marine species monitoring web portal provides details on past and current monitoring projects, including technical reports, publications, presentations, and access

to available data and can be found at: *https://www.navymarinespeciesmonitoring.us/regions/pacific/current-projects/*.

The Navy's marine species monitoring program typically supports 6–10 monitoring projects in the HSTT Study Area at any given time. Projects can be either major multi-year major efforts, or one to two year special studies. Navy monitoring projects in HSTT through 2018 currently include:

- Long-term Trends In Abundance Of Marine Mammals At The Pacific Missile Range Facility (Hawaii—began in 2015);
- Estimation Of Received Levels Of Mid-frequency Active Sonar On Marine Mammals At The Pacific Missile Range Facility (Hawaii—began in 2009);
- Behavioral Response Of Marine Mammals To Training And Testing At The Pacific Missile Range Facility (Hawaii—began in 2009);
- Humpback Whale Satellite Tracking And Genetics (Hawaii, Southern California—began in 2017);
- Navy Civilian Marine Mammal Observers On Navy Destroyers (Hawaii, Southern California began in 2010);
- Blue and Fin Whale Satellite Tracking And Genetics (Southern California—field work 2014–2017 with ongoing analysis);
- Cuvier's Beaked Whale Population Assessment And Impact Assessment At Southern California Anti-Submarine Range (Southern California—began in 2015);
- Cuvier's Beaked Whale Occurrence In Southern California From Passive Acoustic Monitoring (Southern California—began in 2012); and
- Guadalupe Fur Seal Satellite Tracking and Census (Southern California—one-year effort beginning in 2018).

Additional scientific projects may have field efforts within Hawaii and Southern California under separate Navy funding from the Navy's two marine species research programs, the Office of Naval Research Marine Mammals and Biology Program and the Living Marine Resources Program. The periodicity of these research projects are more variable than the Navy's compliance monitoring described above.

Adaptive Management

The final regulations governing the take of marine mammals incidental to Navy training and testing activities in the Study Area would contain an adaptive management component. Our understanding of the effects of Navy training and testing activities (*e.g.*, acoustic and explosive stressors) on marine mammals continues to evolve, which makes the inclusion of an adaptive management component both valuable and necessary within the context of five-year regulations.

The reporting requirements associated with this proposed rule are designed to provide NMFS with monitoring data from the previous year to allow NMFS to consider whether any changes to existing mitigation and monitoring requirements are appropriate. NMFS and the Navy would meet to discuss the monitoring reports, Navy R&D developments, and current science and whether mitigation or monitoring modifications are appropriate. The use of adaptive management allows NMFS to consider new information from different sources to determine (with input from the Navy regarding practicability) on an annual or biennial basis if mitigation or monitoring measures should be modified (including additions or deletions). Mitigation measures could be modified if new data suggests that such modifications would have a reasonable likelihood of reducing adverse effects to marine mammals and if the measures are practicable.

The following are some of the possible sources of applicable data to be considered through the adaptive management process: (1) Results from monitoring and exercises reports, as required by MMPA authorizations; (2) compiled results of Navy funded R&D studies; (3) results from specific stranding investigations; (4) results from general marine mammal and sound research; and (5) any information which reveals that marine mammals may have been taken in a manner, extent, or number not authorized by these regulations or subsequent LOAs.

Proposed Reporting

In order to issue an incidental take authorization for an activity, section 101(a)(5)(A) of the MMPA states that NMFS must set forth "requirements pertaining to the monitoring and reporting of such taking." Effective reporting is critical both to compliance as well as ensuring that the most value is obtained from the required monitoring. Some of the reporting requirements are still in development and the final rulemaking may contain additional minor details not contained here. Additionally, proposed reporting requirements may be modified, removed, or added based on information or comments received during the public comment period. Reports from individual monitoring events, results of analyses, publications, and periodic progress reports for specific monitoring projects would be posted to the Navy's Marine Species Monitoring web portal: *http://www.navymarinespeciesmonitoring.us*. Currently, there are several different reporting requirements pursuant to these proposed regulations:

Notification of Injured, Live Stranded or Dead Marine Mammals

The Navy will abide by the Notification and Reporting Plan, which sets out notification, reporting, and other requirements when injured, live stranded, or dead marine mammals are detected. The Notification and Reporting Plan will be available for review at *https://www.fisheries.noaa.gov/national/marine-mammal-protection/incidental-take-authorizations-military-readiness-activities*.

Annual HSTT Monitoring Report

The Navy shall submit an annual report to NMFS of the HSTT monitoring describing the implementation and results from the previous calendar year. Data collection methods will be standardized across range complexes and HSTT Study Area to allow for comparison in different geographic locations. The draft of the annual monitoring report shall be submitted either three months after the calendar year, or three months after the conclusion of the monitoring year to be determined by the Adaptive Management process. Such a report would describe progress of knowledge made with respect to intermediate scientific objectives within the HSTT Study Area associated with the Integrated Comprehensive Monitoring Program. Similar study questions shall be treated together so that summaries can be provided for each topic area. The report need not include analyses and content that does not provide direct assessment of cumulative progress on the monitoring plan study questions. NMFS will submit comments on the draft monitoring report, if any, within three months of receipt. The report will be considered final after the Navy has addressed NMFS's comments, or three months after the submittal of the draft if NMFS does not have comments.

As an alternative, the Navy may submit a multi-Range Complex annual Monitoring Plan report to fulfill this requirement. Such a report would describe progress of knowledge made with respect to monitoring study questions across multiple Navy ranges associated with the ICMP. Similar study questions shall be treated together so that progress on each topic shall be summarized across multiple Navy ranges. The report need not include analyses and content that does not provide direct assessment of cumulative

progress on the monitoring study question. This will continue to allow Navy to provide a cohesive monitoring report covering multiple ranges (as per ICMP goals), rather than entirely separate reports for the HSTT, Gulf of Alaska, Mariana Islands, and the Northwest Study Areas, etc.

Annual HSTT Training Exercise Report and Testing Activity Report

Each year, the Navy will submit two preliminary reports to NMFS detailing the status of authorized sound sources within 21 days after the anniversary of the date of issuance of the LOA. Each year, the Navy shall submit detailed reports to NMFS within 3 months after the anniversary of the date of issuance of the LOA. The annual reports shall contain information on MTEs, Sinking Exercise (SINKEX) events, and a summary of all sound sources used (total hours or quantity (per the LOA) of each bin of sonar or other non-impulsive source; total annual number of each type of explosive exercises; and total annual expended/detonated rounds (missiles, bombs, sonobuoys, etc.) for each explosive bin). The analysis in the detailed reports will be based on the accumulation of data from the current year's report and data collected from previous reports. The Annual HSTT Training Exercise Report and Testing Activity Navy reports can be consolidated with other exercise reports from other range complexes in the Pacific Ocean for a single Pacific Exercise Report, if desired. Specific sub-reporting in these annual reports include:

- Humpback Whale Special Reporting Area (December 15–April 15): The Navy will report the total hours of operation of surface ship hull-mounted mid-frequency active sonar used in the special reporting area;
- HSTT Mitigation Areas (see section 11 of the Navy's application): The Navy will report any use that occurred as specifically described in these areas; and
- Information included in the classified annual reports may be used to inform future adaptive management of activities within the HSTT Study Area.

Other Reporting and Coordination

The Navy will continue to report and coordinate with NMFS for the following:

- Annual marine species monitoring technical review meetings with researchers, regulators and Marine Mammal Commission (currently, every two years a joint Pacific-Atlantic meeting is held); and
- Annual Adaptive Management meetings with NMFS, regulators and Marine Mammal Commission (recently modified to occur in conjunction with the annual monitoring technical review meeting).

Preliminary Negligible Impact Analysis and Determination

Negligible Impact Analysis

Introduction

NMFS has defined negligible impact as "an impact resulting from the specified activity that cannot be reasonably expected to, and is not reasonably likely to, adversely affect the species or stock through effects on annual rates of recruitment or survival: (50 CFR 216.103). A negligible impact finding is based on the lack of likely adverse effects on annual rates of recruitment or survival (*i.e.*, population-level effects). An estimate of the number of takes alone is not enough information on which to base an impact determination. In addition to considering estimates of the number of marine mammals that might be "taken" through mortality, serious injury, and Level A or Level B harassment (as presented in Tables 41 and 42), NMFS considers other factors, such as the likely nature of any responses (*e.g.*, intensity, duration), the context of any responses (*e.g.*, critical reproductive time or location, migration), as well as effects on habitat, and the likely effectiveness of the mitigation. We also assess the number, intensity, and context of estimated takes by evaluating this information relative to population status. Consistent with the 1989 preamble for NMFS's implementing regulations (54 FR 40338; September 29, 1989), the impacts from other past and ongoing anthropogenic activities are incorporated into this analysis via their impacts on the environmental baseline (*e.g.*, as reflected in the regulatory status of the species, population size and growth rate where known, other ongoing sources of human-caused mortality, ambient noise levels, and specific consideration of take by Level A harassment or serious injury or mortality (hereafter referred to as M/SI) previously authorized for other NMFS activities).

In the Estimated Take section, we identified the subset of potential effects that would be expected to rise to the level of takes, and then identified the number of each of those takes that we believe could occur (mortality) or are likely to occur (harassment) based on the methods described. The impact that any given take will have is dependent on many case-specific factors that need to be considered in the negligible impact analysis (*e.g.*, the context of behavioral exposures such as duration or intensity of an disturbance, the health of impacted animals, the status of a species that incurs fitness-level impacts to individuals, *etc.*). Here, we evaluate the likely impacts of the enumerated harassment takes that are proposed for authorization and anticipated to occur in this rule, in the context of the specific circumstances surrounding these predicted takes. We also include a specific assessment of serious injury or mortality takes that could occur, as well as consideration of the traits and statuses of the affected species and stocks. Last, we pull all of this information, as well as other more taxa-specific information and the mitigation measure effectiveness, together into group-specific discussions that support our negligible impact conclusions for each stock.

Harassment

The Navy's Specified Activities reflects representative levels/ranges of training and testing activities, accounting for the natural fluctuation in training, testing, and deployment schedules. This approach is representative of how Navy's activities are conducted over any given year over any given five-year period. Specifically, to calculate take, the Navy provided a range of levels for each activity/source type for a year—they used the maximum annual level to calculate annual takes, and they used the sum of three nominal years (average level) and two maximum years to calculate five-year takes for each source type. The Specified Activities section contains a more realistic annual representation of activities, but includes years of a higher maximum amount of training and testing to account for these fluctuations. There may be some flexibility in the exact number of hours, items, or detonations that may vary from year to year, but take totals would not exceed the five-year totals indicated in Tables 41 and 42. We base our analysis and negligible impact determination (NID) on the maximum number of takes that could occur or are likely to occur, although, as stated before, the number of takes are only a part of the analysis, which includes extensive qualitative consideration of other contextual factors that influence the degree of impact of the takes on the affected individuals. To avoid repetition, we provide some general analysis immediately below that applies to all the species listed in Tables 41 and 42, given that some of the anticipated effects of the Navy's training and testing activities on marine

mammals are expected to be relatively similar in nature. However, below that, we break our analysis into species (and/or stock), or groups of species (and the associated stocks) where relevant similarities exist, to provide more specific information related to the anticipated effects on individuals of a specific stock or where there is information about the status or structure of any species that would lead to a differing assessment of the effects on the species or stock.

The Navy's harassment take request is based on its model and quantitative assessment of mitigation, which NMFS believes appropriately predicts that amount of harassment that is likely to occur. In the discussions below, the "acoustic analysis" refers to the Navy's modeling results and quantitative assessment of mitigation. The model calculates sound energy propagation from sonar, other active acoustic sources, and explosives during naval activities; the sound or impulse received by animat dosimeters representing marine mammals distributed in the area around the modeled activity; and whether the sound or impulse energy received by a marine mammal exceeds the thresholds for effects. Assumptions in the Navy model intentionally err on the side of overestimation when there are unknowns. Naval activities are modeled as though they would occur regardless of proximity to marine mammals, meaning that no mitigation is considered (*e.g.*, no power down or shut down) and without any avoidance of the activity by the animal. The final step of the quantitative analysis of acoustic effects, which occurs after the modeling, is to consider the implementation of mitigation and the possibility that marine mammals would avoid continued or repeated sound exposures. NMFS provided input to, and concurred with, the Navy on this process and the Navy's analysis, which is described in detail in Section 6 of the Navy's rulemaking/LOA application (*https://www.fisheries.noaa.gov/;national/marine-mammal-protection/incidental-take-authorizations-military-readiness-activities*), was used to quantify harassment takes for this rule.

Generally speaking, the Navy and NMFS anticipate more severe effects from takes resulting from exposure to higher received levels (though this is in no way a strictly linear relationship for behavioral effects throughout species, individuals, or circumstances) and less severe effects from takes resulting from exposure to lower received levels. However, there is also growing evidence of the importance of distance in predicting marine mammal behavioral response to sound—*i.e.*, sounds of a similar level emanating from a more distant source have been shown to be less likely to evoke a response of equal magnitude (DeRuiter 2012). The estimated number of Level A and Level B takes does not equate to the number of individual animals the Navy expects to harass (which is lower), but rather to the instances of take (*i.e.*, exposures above the Level A and Level B harassment threshold) that are anticipated to occur over the five-year period. These instances may represent either brief exposures (seconds or minutes) or, in some cases, longer durations of exposure within a day. Some individuals may experience multiple instances of take (meaning over multiple days) over the course of the year, while some members of a species or stock may not experience take at all which means that the number of individuals taken is smaller than the total estimated takes. In other words, where the instances of take exceed the number of individuals in the population, repeated takes (on more than one day) of some individuals are predicted. Generally speaking, the higher the number of takes as compared to the population abundance, the more repeated takes of individuals are likely, and the higher the actual percentage of individuals in the population that are likely taken at least once in a year. We look at this comparative metric to give us a relative sense across species/stocks of where larger portions of the stocks are being taken by Navy activities and where there is a higher likelihood that the same individuals are being taken across multiple days and where that number of days might be higher. In the ocean, the use of sonar and other active acoustic sources is often transient and is unlikely to repeatedly expose the same individual animals within a short period, for example within one specific exercise, however, some repeated exposures across different activities could occur over the year, especially where events occur in generally the same area with more resident species. In short, we expect that the total anticipated takes represent exposures of a smaller number of individuals of which some were exposed multiple times, but based on the nature of the Navy activities and the movement patterns of marine mammals, it is unlikely any particular subset would be taken over more than a few sequential days—*i.e.*, where repeated takes of individuals are likely to occur, they are more likely to result from non-sequential exposures from different activities and marine mammals are not predicted to be taken for more than a few days in a row, at most. As described elsewhere, the nature of the majority of the exposures would be expected to be of a less severe nature and based on the numbers it is still likely that any individual exposed multiple times is still only taken on a small percentage of the days of the year. The greater likelihood is that not every individual is taken, or perhaps a smaller subset is taken with a slightly higher average and larger variability of highs and lows, but still with no reason to think that any individuals would be taken every day for months out of the year, much less on sequential days.

Depending on the location, duration, and frequency of activities, along with the distribution and movement of marine mammals, individual animals may be exposed to impulse or non-impulse sounds at or above the Level A and Level B harassment threshold on multiple days. However, the Navy is currently unable to estimate the number of individuals that may be taken during training and testing activities. The model results estimate the total number of takes that may occur to a smaller number of individuals.

Some of the lower level physiological stress responses (*e.g.*, orientation or startle response, change in respiration, change in heart rate) discussed earlier would also likely co-occur with the predicted harassments, although these responses are more difficult to detect and fewer data exist relating these responses to specific received levels of sound. Level B takes, then, may have a stress-related physiological component as well; however, we would not expect the Navy's generally short-term, intermittent, and (typically in the case of sonar) transitory activities to create conditions of long-term, continuous noise leading to long-term physiological stress responses in marine mammals.

The estimates calculated using the behavioral response function do not differentiate between the different types of behavioral responses that rise to the level of Level B harassments. As described in the Navy's application, the Navy identified (with NMFS's input) the types of behaviors that would be considered a take (moderate behavioral responses as characterized in Southall *et al.*, 2007 (*e.g.*, altered migration paths or dive profiles, interrupted nursing breeding or feeding, or avoidance) that also would be expected to continue for the duration of an exposure) and then compiled the available data indicating at what received levels and distances those responses have occurred, and used the indicated literature to build biphasic behavioral response curves that

are used to predict how many instances of behavioral take occur in a day. Nor do the estimates provide information regarding the potential fitness or other biological consequences of the reactions on the affected individuals. We therefore consider the available activity-specific, environmental, and species-specific information to determine the likely nature of the modeled behavioral responses and the potential fitness consequences for affected individuals.

Use of sonar and other transducers would typically be transient and temporary. The majority of acoustic effects to mysticetes from sonar and other active sound sources during testing and training activities would be primarily from ASW events. It is important to note although ASW is one of the warfare areas of focus during MTEs, there are significant periods when active ASW sonars are not in use. Nevertheless, behavioral reactions are assumed more likely to be significant during MTEs than during other ASW activities due to the duration (*i.e.*, multiple days), scale (*i.e.*, multiple sonar platforms), and use of highpower hull-mounted sonar in the MTEs. In other words, in the range of potential behavioral effects that might expect to be part of a response that qualifies as an instance take (which by nature of the way it is modeled/counted, occurs within one day), the less severe end might include exposure to comparatively lower levels of a sound, at a detectably greater distance from the animal, for a few or several minutes, and that could result in a behavioral response such as avoiding an area that an animal would otherwise have chosen to move through or feed in for some amount of time or breaking off one or a few feeding bouts. The more severe end, which occurs a smaller amount of the time (when the animal gets close enough to the source to receive a comparatively higher level, is exposed continuously to one source for a longer time, or is exposed intermittently to different sources throughout a day) might result in an animal having a more severe flight response and leaving a larger area for a day or more or potentially losing feeding opportunities for a day. To help assess this, for sonar (LFAS/MFAS/HFAS) used in the HSTT Study Area, the Navy provided information estimating the percentage of animals that may exhibit a significant behavior response under each behavioral response function that would occur within 6-dB increments (percentages discussed below in the Group and Species-Specific Analysis section). As mentioned above, all else being equal, an animal's exposure to a higher received level is more likely to result in a behavioral response that is more likely to lead to adverse effects, which could more likely accumulate to impacts on reproductive success or survivorship of the animal, but as mentioned previously other contextual factors (such as distance) are important also. The majority of Level B takes are expected to be in the form of milder responses (*i.e.*, lower-level exposures that still rise to the level of take, but would likely be less severe in the range of responses that qualify as take) of a generally shorter duration. We anticipate more severe effects from takes when animals are exposed to higher received levels or at closer proximity to the source. These discussions are presented within each species group below in the Group and Species-Specific Analysis section. Specifically, given a range of behavioral responses that may be classified as Level B harassment, to the degree that higher received levels are expected to result in more severe behavioral responses, only a smaller percentage of the anticipated Level B harassment (see the Group and Species-Specific Analysis section below for more detailed information) from Navy activities might necessarily be expected to potentially result in more severe responses. To fully understand the likely impacts of the predicted/authorized take on an individual (*i.e.*, what is the likelihood or degree of fitness impacts), one must look closely at the available contextual information, such as the duration of likely exposures and the likely severity of the exposures (*e.g.*, will they occur from high level hull-mounted sonars or smaller less impactful sources). Moore and Barlow (2013) emphasizes the importance of context (*e.g.*, behavioral state of the animals, distance from the sound source, etc.) in evaluating behavioral responses of marine mammals to acoustic sources.

Diel Cycle

As noted previously, many animals perform vital functions, such as feeding, resting, traveling, and socializing on a diel cycle (24-hour cycle). Behavioral reactions to noise exposure (when taking place in a biologically important context, such as disruption of critical life functions, displacement, or avoidance of important habitat) are more likely to be significant if they last more than one diel cycle or recur on subsequent days (Southall *et al.*, 2007). Henderson *et al.*, 2016 found that ongoing smaller scale events had little to no impact on foraging dives for Blainville's beaked whale, while multi-day training events may decrease foraging behavior for Blainville's beaked whale (Manzano-Roth *et al.*, 2016). Consequently, a behavioral response lasting less than one day and not recurring on subsequent days is not considered severe unless it could directly affect reproduction or survival (Southall *et al.*, 2007). Note that there is a difference between multiple-day substantive behavioral reactions and multiple-day anthropogenic activities. For example, just because an at-sea exercise lasts for multiple days does not necessarily mean that individual animals are either exposed to those exercises for multiple days or, further, exposed in a manner resulting in a sustained multiple day substantive behavioral response. Large multi-day Navy exercises such as ASW activities, typically include vessels that are continuously moving at speeds typically 10–15 kn, or higher, and likely cover large areas that are relatively far from shore (typically more than 3 nmi from shore) and in waters greater than 600 ft deep, in addition to the fact that marine mammals are moving as well, which would make it unlikely that the same animal could remain in the immediate vicinity of the ship for the entire duration of the exercise. Further, the Navy does not necessarily operate active sonar the entire time during an exercise. While it is certainly possible that these sorts of exercises could overlap with individual marine mammals multiple days in a row at levels above those anticipated to result in a take, because of the factors mentioned above, it is considered unlikely for the majority of takes. However, it is also worth noting that the Navy conducts many different types of noise-producing activities over the course of the year and it is likely that some marine mammals will be exposed to more than one and taken on multiple days, even if they are not sequential.

Durations of Navy activities utilizing tactical sonar sources and explosives vary and are fully described in Appendix A of the HSTT DEIS/OEIS. Sonar used during ASW would impart the greatest amount of acoustic energy of any category of sonar and other transducers analyzed in the Navy's rulemaking/LOA application and included hull-mounted, towed, sonobuoy, helicopter dipping, and torpedo sonars. Most ASW sonars are MFAS (1–10 kHz); however, some sources may use higher or lower frequencies. ASW training activities using hull mounted sonar proposed for the HSTT Study Area generally last for only a few hours. Some ASW training

and testing can generally last for 2–10 days, or as much as 21 days for an MTE-Large Integrated ASW (see Table 4). For these multi-day exercises there will be extended intervals of non-activity in between active sonar periods. Because of the need to train in a large variety of situations, the Navy does not typically conduct successive ASW exercises in the same locations. Given the average length of ASW exercises (times of sonar use) and typical vessel speed, combined with the fact that the majority of the cetaceans would not likely remain in proximity to the sound source, it is unlikely that an animal would be exposed to LFAS/MFAS/HFAS at levels or durations likely to result in a substantive response that would then be carried on for more than one day or on successive days.

Most planned explosive events are scheduled to occur over a short duration (1–8 hours); however, the explosive component of the activity only lasts for minutes (see Tables 4 through 7). Although explosive exercises may sometimes be conducted in the same general areas repeatedly, because of their short duration and the fact that they are in the open ocean and animals can easily move away, it is similarly unlikely that animals would be exposed for long, continuous amounts of time. Although SINKEXs may last for up to 48 hrs (4–8 hrs, possibly 1–2 days), they are almost always completed in a single day and only one event is planned annually for the HSTT training activities. They are stationary and conducted in deep, open water (where fewer marine mammals would typically be expected to be randomly encountered), and they have rigorous monitoring (*i.e.*, during the activity, conduct passive acoustic monitoring and visually observe for marine mammals 90 min prior to the first firing, during the event, and 2 hrs after sinking the vessel) and shutdown procedures all of which make it unlikely that individuals would be exposed to the exercise for extended periods or on consecutive days.

Last, as described previously, Navy modeling uses the best available science to predict the instances of exposure above certain acoustic thresholds, which are equated, as appropriate, to harassment takes (and further corrected to account for mitigation and avoidance). As further noted, for active acoustics, it is more challenging to parse out the number of individuals taken from this larger number of instances. One method that NMFS can use to help better understand the overall scope of the impacts is to compare these total instances of take against the abundance of that stock. For example, if there are 100 takes in a population of 100, one can assume either that every individual was exposed above acoustic thresholds in no more than one day, or that some smaller number were exposed in one day but a few of those individuals were exposed multiple days within a year. Where the instances of take exceed 100 percent of the population, multiple takes of some individuals are predicted to occur within a year. Generally speaking, the higher the number of takes as compared to the population abundance, the more multiple takes of individuals are likely, and the higher the actual percentage of individuals in the population that are likely taken at least once in a year. We look at this comparative metric to give us a relative sense across species/stocks of where larger portions of the stocks are being taken by Navy activities and where there is a higher likelihood that the same individuals are being taken across multiple days and where that number of days might be higher. At a minimum, it provides a relative picture of the scale of impacts to each stock.

In the ocean, unlike a modeling simulation with static animals, the use of sonar and other active acoustic sources is often transient, and is unlikely to repeatedly expose the same individual animals within a short period, for example within one specific exercise. However, some repeated exposures across different activities would likely occur over the year, especially where numerous activities occur in generally the same area (for example on instrumented ranges) with more resident species. In short, we expect that the total anticipated takes represent exposures of a smaller number of individuals of which some would be exposed multiple times, but based on the nature of the Navy's activities and the movement patterns of marine mammals, it is unlikely that any particular subset would be taken over more than a few sequential days—*i.e.*, where repeated takes of individuals are likely to occur. They are more likely to result from non-sequential exposures from different activities and the majority of marine mammal stocks are not predicted to be taken for more than a few days in a row.

When calculating the proportion of a population affected by takes (*e.g.*, the number of takes divided by population abundance), it is important to choose an appropriate population estimate to make the comparison. The SARs provide the official population estimate for a given species or stock in U.S. waters in a given year (and are typically based solely on the most recent survey data). However, the Study Area encompasses large areas of ocean space outside U.S. waters; therefore, the SARs do not account for the total abundance in the Study Area. Additionally, the SARs are not to the only information used to estimate takes, instead modeled density layers are used, which incorporate the SAR surveys and other survey data. If takes are calculated from another dataset (for example a broader sample of survey data) and compared to the population estimate from the SARs, it may distort the percent of the population affected because of different population baselines. The estimates found in NMFS's SARs remain the official estimates of stock abundance where they are current. These estimates are typically generated from the most recent shipboard and/or aerial surveys conducted. Studies based on abundance and distribution surveys restricted to U.S. waters are unable to detect temporal shifts in distribution beyond U.S. waters that might account for any changes in abundance within U.S. waters. In some cases, NMFS's abundance estimates show substantial year-to-year variability. However, for highly migratory species (*e.g.*, large whales) or those whose geographic distribution extends well beyond the boundaries of the Navy's study area (*e.g.*, population with distribution along the entire California Current versus just SOCAL), comparisons to the SAR may be more appropriate. This is because the Navy's acoustic modeling process does not horizontally move animats, and therefore does not account for immigration and emigration within the study area. For instance, while it may be accurate that the abundance of animals in Southern California at any one time for a particular species is 200 individuals, if the species is highly migratory or has large daily home ranges, it is not likely that the same 200 individuals would be present every day. A good descriptive example is blue whales, which tagging data have shown traverse the SOCAL area in a few days to weeks on their migrations. Therefore, at any one time there may be a stable number of animals, but over the course of the entire year the entire population may cycle through SOCAL. Therefore, when comparing the estimated takes to an abundance, in this case the SAR, which represents the total population, may be more appropriate than the Navy's modeled abundance for SOCAL. In each of the species write-ups for the negligible impact assessment we explain which abundance was used for making the comparison of takes to the impacts to the population.

NMFS's Southwest Fisheries Science Center derived densities for the Navy, and NMFS supports, the use of spatially and temporally explicit density models that vary in space and time to estimate their potential impacts to species. See the *U.S. Navy Marine Species Density Database Phase III Hawaii-Southern California Training and Testing Area Technical Report* to learn more on how the Navy selects density information and the models selected for individual species. These models may better characterize how Navy impacts can vary in space and time but often predict different population abundances than the SARs.

Models may predict different population abundances for many reasons. The models may be based on different data sets or different temporal predictions may be made. The SARs are often based on single years of NMFS surveys, whereas the models used by the Navy generally include multiple years of survey data from NMFS, the Navy, and other sources. To present a single, best estimate, the SARs often use a single season survey where they have the best spatial coverage (generally summer). Navy models often use predictions for multiple seasons, where appropriate for the species, even when survey coverage in non-summer seasons is limited, to characterize impacts over multiple seasons as Navy activities may occur in any season. Predictions may be made for different spatial extents. Many different, but equally valid, habitat and density modeling techniques exist and these can also be the cause of differences in population predictions. Differences in population estimates may be caused by a combination of these factors. Even similar estimates should be interpreted with caution and differences in models be fully understood before drawing conclusions.

The Navy Study Area covers a broad area off of Hawaii and Southern California, and the Navy has tried to find density estimates for this entire area, where appropriate given species distributions. However, only a small number of Navy training and testing activities occur outside of the U.S. EEZ. Because of the differences in the availability of data in the U.S. EEZ versus outside (which results in more accurate density and abundance estimates inside the U.S. EEZ) and the fact that activities and takes are more concentrated in the U.S. EEZ, NMFS chose to look at how estimated instances of take compare to predicted abundance both within the U.S. EEZ and across the entire study area to help better understand, at least in a relative sense, what the estimated instances of take tell us about either the likely number of individuals taken, and/or over how many days they might be taken. These comparisons are undertaken below in the taxa-specific sections.

Temporary Threshold Shift

NMFS and the Navy have estimated that some individuals of some species of marine mammals may sustain some level of TTS from active sonar. As mentioned previously, TTS can last from a few minutes to days, be of varying degree, and occur across various frequency bandwidths, all of which determine the severity of the impacts on the affected individual, which can range from minor to more severe. Tables 69–81 indicate the amounts of TTS that may be incurred by different stocks from exposure to acoustic sources (sonar, air guns, pile driving) and explosives. The TTS sustained by an animal is primarily classified by three characteristics:

1. Frequency—Available data (of mid-frequency hearing specialists exposed to mid- or high-frequency sounds; Southall *et al.*, 2007) suggest that most TTS occurs in the frequency range of the source up to one octave higher than the source (with the maximum TTS at ½ octave above). The Navy's MF sources the 1–10 kHz frequency band, which suggests that if TTS were to be induced by any of these MF sources would be in a frequency band somewhere between approximately 2 and 20 kHz. There are fewer hours of HF source use and the sounds would attenuate more quickly, plus they have lower source levels, but if an animal were to incur TTS from these sources, it would cover a higher frequency range (sources are between 10 and 100 kHz, which means that TTS could range up to 200 kHz; however, HF systems are typically used less frequently and for shorter time periods than surface ship and aircraft MF systems, so TTS from these sources is even less likely). TTS from explosives would be broadband.

2. Degree of the shift (*i.e.*, by how many dB the sensitivity of the hearing is reduced)—Generally, both the degree of TTS and the duration of TTS will be greater if the marine mammal is exposed to a higher level of energy (which would occur when the peak dB level is higher or the duration is longer). The threshold for the onset of TTS was discussed previously in this proposed rule. An animal would have to approach closer to the source or remain in the vicinity of the sound source appreciably longer to increase the received SEL, which would be difficult considering the Lookouts and the nominal speed of an active sonar vessel (10–15 kn). In the TTS studies (see Threshold Shift section), some using exposures of almost an hour in duration or up to 217 SEL, most of the TTS induced was 15 dB or less, though Finneran *et al.* (2007) induced 43 dB of TTS with a 64-second exposure to a 20 kHz source. However, since any hull-mounted sonar such as the SQS–53 (MFAS), emits a ping typically every 50 sec, incurring those levels of TTS is highly unlikely.

3. Duration of TTS (recovery time)—In the TTS laboratory studies (see Threshold Shift) section), some using exposures of almost an hour in duration or up to 217 SEL, almost all individuals recovered within 1 day (or less, often in minutes), although in one study (Finneran *et al.*, 2007), recovery took 4 days.

Based on the range of degree and duration of TTS reportedly induced by exposures to non-pulse sounds of energy higher than that to which free-swimming marine mammals in the field are likely to be exposed during LFAS/MFAS/HFAS training and testing exercises in the HSTT Study Area, it is unlikely that marine mammals would ever sustain a TTS from MFAS that alters their sensitivity by more than 20 dB for more than a few hours (and any incident of TTS would likely be far less severe due to the short duration of the majority of the events and the speed of a typical vessel). Also, for the same reasons discussed in the Diel Cycle section, and because of the short distance within which animals would need to approach the sound source, it is unlikely that animals would be exposed to the levels necessary to induce TTS in subsequent time periods such that their recovery is impeded. Additionally, though the frequency range of TTS that marine mammals might sustain would overlap with some of the frequency ranges of their vocalization types, the frequency range of TTS from MFAS (the source from which TTS would most likely be sustained because the higher source level and slower attenuation make it more likely that an animal would be exposed to a higher received level) would not usually span the entire frequency range of one vocalization type, much less span all types of vocalizations or other critical auditory cues. If impaired, marine mammals would typically be aware of their impairment and would sometimes able to implement behaviors to compensate (see Acoustic Masking or Communication Impairment section), though these compensations may incur energetic costs.

Therefore, even though the models show that the affected species and stocks will experience Level B

harassment at the levels shown in Tables 69–81 and that much of that harassment will occur in the form of TTS, the actual TTS that will result from Navy's activities is expected to be both mild and short-term for the majority of exposed animals. While the TTS experienced by some animals would overlap with the frequency ranges of their vocalizations, it is unlikely that it would affect all vocalizations and other critical auditory clues, and impaired animals may be able to compensate until they have recovered. For these reasons, the majority of the Level B harassment in the form of TTS shown in Tables 69–81 is expected to be short-term and not to have significant impacts on affected animals in a manner that would affect reproduction or survival.

Acoustic Masking or Communication Impairment

Masking only occurs during the time of the signal (and potential secondary arrivals of indirect rays), versus TTS, which continues beyond the duration of the signal. Standard MFAS typically pings every 50 seconds for hull-mounted sources. Hull-mounted anti-submarine sonars can also be used in an object detection mode known as "Kingfisher" mode (*e.g.*, used on vessels when transiting to and from port), pulse length is shorter, but pings are much closer together in both time and space, since the vessel goes slower when operating in this mode. For the majority of sources, the pulse length is significantly shorter than hull-mounted active sonar, on the order of several microseconds to tens of microseconds. For hull-mounted active sonar, though some of the vocalizations that marine mammals make are less than one second long, there is only a 1 in 50 chance that they would occur exactly when the ping was received, and when vocalizations are longer than one second, only parts of them are masked. Alternately, when the pulses are only several microseconds long, the majority of most animals' vocalizations would not be masked.

Most ASW sonars and countermeasures use MF frequencies and a few use LF and HF frequencies. Most of these sonar signals are limited in the temporal, frequency, and spatial domains. The duration of most individual sounds is short, lasting up to a few seconds each. Very few systems operate with higher duty cycles or nearly continuously, but typically use lower power. Nevertheless, masking may be more prevalent at closer ranges to these high-duty cycle and continuous active sonar systems. Most ASW activities are geographically dispersed and last for only a few hours, often with intermittent sonar use even within this period. Most ASW sonars also have a narrow frequency band (typically less than one-third octave). These factors reduce the likelihood of sources causing significant masking in mysticetes. HF sonars are typically used for mine hunting, navigation, and object detection. HF (greater than 10 kHz) sonars fall outside of the best hearing and vocalization ranges of mysticetes. Furthermore, HF (above 10 kHz) attenuate more rapidly in the water due to absorption than do lower frequency signals, thus producing only a small zone of potential masking. Masking in mysticetes due to exposure to high-frequency sonar is unlikely. Masking effects from LFAS/MFAS/HFAS are expected to be minimal. If masking or communication impairment were to occur briefly, it would be in the frequency range of MFAS, which overlaps with some marine mammal vocalizations; however, it would likely not mask the entirety of any particular vocalization, communication series, or other critical auditory cue, because the signal length, frequency, and duty cycle of the MFAS/HFAS signal does not perfectly resemble the characteristics of any marine mammal's vocalizations. Masking could occur in mysticetes due to the overlap between their low-frequency vocalizations and the dominant frequencies of air gun pulses. However, masking in odontocetes or pinnipeds is less likely unless the air gun activity is in close range when the pulses are more broadband. Masking is more likely to occur in the presence of broadband, relatively continuous noise sources such as during vibratory pile driving and from vessels. The other sources used in Navy training and testing, many of either higher frequencies (meaning that the sounds generated attenuate even closer to the source) or lower amounts of operation, are similarly not expected to result in masking. For the reasons described here, any limited masking that could potentially occur would be minor and short-term and not expected to have adverse impacts on reproductive success or survivorship.

PTS From Sonar Acoustic Sources and Explosives and Tissue Damage From Explosives

Tables 69–81 indicate the number of individuals of each species and stock for which Level A harassment in the form of PTS resulting from exposure to active sonar and/or explosives is estimated to occur. Tables 69–81 also indicate the number of individuals of each species and stock for which Level A harassment in the form of tissue damage resulting from exposure to explosive detonations is estimated to occur. The number of individuals to potentially incur PTS annually (from sonar and explosives) for the predicted species ranges from 0 to 209 (209 for Dall's porpoise), but is more typically zero or a few up to 18 (with the exception of a few species *i.e.*, short-beaked common dolphin, Kogia whales, Dall's porpoise, California sea lion, and Northern elephant seal). The number of individuals to potentially incur tissue damage from explosives for the predicted species ranges from 0 to 10 (10 for short-beaked common dolphin and 9 for California sea lion), but is typically zero in most cases. Overall the Navy's model estimated that a total 24 marine mammals annually would be exposed to explosives during training and testing at levels that could result in non-auditory injury. Overall, takes from Level A harassment (PTS and Tissue Damage) account for less than one percent of all total takes.

NMFS believes that many marine mammals would deliberately avoid exposing themselves to the received levels of active sonar necessary to induce injury by moving away from or at least modifying their path to avoid a close approach. Additionally, in the unlikely event that an animal approaches the sonar-emitting vessel at a close distance, NMFS believes that the mitigation measures (*i.e.*, shutdown/powerdown zones for active sonar) would typically ensure that animals would not be exposed to injurious levels of sound. Some, but likely not all, of the anticipated avoidance and mitigation has been accounted for in the Navy's quantitative assessment of mitigation—regardless we analyze the impacts of those potential takes in case they should occur. As discussed previously, the Navy utilizes both aerial (when available) and passive acoustic monitoring (during ASW exercises—passive acoustic detections are used as a cue for Lookouts' visual observations when passive acoustic assets are already participating in an activity) in addition to lookouts on vessels to detect marine mammals for mitigation implementation.

If a marine mammal is able to approach a surface vessel within the distance necessary to incur PTS, the likely speed of the vessel (nominally 10–15 kn) would make it very difficult for the animal to remain in range long enough to accumulate enough energy to result in more than a mild case of PTS. As mentioned previously and in relation to TTS, the likely consequences to the health of an individual that incurs PTS

can range from mild to more serious dependent upon the degree of PTS and the frequency band it is in, and many animals are able to compensate for the shift, although it may include energetic costs. We also assume that the acoustic exposures sufficient to trigger onset PTS (or TTS) would be accompanied by physiological stress responses, although the sound characteristics that correlate with specific stress responses in marine mammals are poorly understood. As discussed above for Behavioral Harassment, we would not expect the Navy's generally short-term, intermittent, and (in the case of sonar) transitory activities to create conditions of long-term, continuous noise leading to long-term physiological stress responses in marine mammals.

For explosive activities, the Navy implements mitigation measures (described in Proposed Mitigation Measures) during explosive activities, including delaying detonations when a marine mammal is observed in the mitigation zone. Observing for marine mammals during the explosive activities will include aerial and passive acoustic detection methods (when they are available and part of the activity) before the activity begins, in order to cover the mitigation zones that can range from 200 yds (183 m) to 2,500 yds (2,286 m) depending on the source (*e.g.*, explosive sonobuoy, explosive torpedo, explosive bombs) and 2.5 nmi for sinking exercise (see Tables 48–55).

Nearly all explosive events will occur during daylight hours to improve the sightability of marine mammals improving mitigation effectiveness. The proposed mitigation is expected to reduce the likelihood that all of the proposed takes will occur. Some, though likely not all, of that reduction was quantified in the Navy's quantitative assessment of mitigation; however, we analyze the type and amount of Level A take indicated in Tables 41 and 42. Generally speaking, the number and degree of potential injury are low.

Therefore, given that the numbers of anticipated injury in the form of PTS or tissue damage are very low (<18 or single digits, respectively), for any given stock, with the exception of a few species, and the severity of these impacts are expected to be on the less severe end of what could potentially occur because of the factors described above, as well as the fact that any PTS incurred may overlap with the frequency ranges of their vocalizations, but is unlikely to affect all vocalizations and other critical auditory clues, the Level A harassment shown in Tables 69–81 is not expected to have significant or long-term impacts on affected animals in a manner that would affect reproduction or survival.

Serious Injury and Mortality

NMFS proposes to authorize a very small number of serious injuries or mortalities that could occur in the event of a ship strike or as a result of marine mammal exposure to explosive detonations. We note here that the takes from potential ship strikes or explosive exposures enumerated below could result in non-serious injury, but their worse potential outcome (mortality) is analyzed for the purposes of the negligible impact determination.

In addition, we discuss here the connection between the mechanisms for authorizing incidental take under section 101(a)(5) for activities, such as Navy's testing and training in the HSTT Study Area, and for authorizing incidental take from commercial fisheries. In 1988, Congress amended the MMPA's provisions for addressing incidental take of marine mammals in commercial fishing operations. Congress directed NMFS to develop and recommend a new long-term regime to govern such incidental taking (see MMC, 1994). The need to develop a system suited to the unique circumstances of commercial fishing operations led NMFS to suggest a new conceptual means and associated regulatory framework. That concept, Potential Biological Removal (PBR), and a system for developing plans containing regulatory and voluntary measures to reduce incidental take for fisheries that exceed PBR were incorporated as sections 117 and 118 in the 1994 amendments to the MMPA.

PBR is defined in the MMPA (16 U.S.C. 1362(20)) as ''the maximum number of animals, not including natural mortalities, that may be removed from a marine mammal stock while allowing that stock to reach or maintain its optimum sustainable population'' (OSP) and is a measure to be considered when evaluating the effects of M/SI on a marine mammal species or stock. OSP is defined by the MMPA (16 U.S.C. 1362(9)) as ''the number of animals which will result in the maximum productivity of the population or the species, keeping in mind the carrying capacity of the habitat and the health of the ecosystem of which they form a constituent element.'' A primary goal of the MMPA is to ensure that each species or stock of marine mammal is maintained at or returned to its OSP.

PBR values are calculated by NMFS as the level of annual removal from a stock that will allow that stock to equilibrate within OSP at least 95 percent of the time, and is the product of factors relating to the minimum population estimate of the stock (N_{min}); the productivity rate of the stock at a small population size; and a recovery factor. Determination of appropriate values for these three elements incorporates significant precaution, such that application of the parameter to the management of marine mammal stocks may be reasonably certain to achieve the goals of the MMPA. For example, calculation of N_{min} incorporates the precision and variability associated with abundance information and is intended to provide reasonable assurance that the stock size is equal to or greater than the estimate (Barlow *et al.*, 1995). In general, the three factors are developed on a stock-specific basis in consideration of one another in order to produce conservative PBR values that appropriately account for both imprecision that may be estimated, as well as potential bias stemming from lack of knowledge (Wade, 1998).

PBR can be used as a consideration of the effects of M/SI on a marine mammal stock but was applied specifically to work within the management framework for commercial fishing incidental take. PBR cannot be applied appropriately outside of the section 118 regulatory framework for which it was designed without consideration of how it applies in section 118 and how other statutory management frameworks in the MMPA differ. PBR was not designed as an absolute threshold limiting commercial fisheries, but rather as a means to evaluate the relative impacts of those activities on marine mammal stocks. Even where commercial fishing is causing M/SI at levels that exceed PBR, the fishery is not suspended. When M/SI exceeds PBR, NMFS may develop a take reduction plan, usually with the assistance of a take reduction team. The take reduction plan will include measures to reduce and/or minimize the taking of marine mammals by commercial fisheries to a level below the stock's PBR. That is, where the total annual human-caused M/SI exceeds PBR, NMFS is not required to halt fishing activities contributing to total M/SI but rather utilizes the take reduction process to further mitigate the effects of fishery activities via additional bycatch reduction measures. PBR is not used to grant or deny authorization of commercial fisheries that may incidentally take marine mammals.

Similarly, to the extent consideration of PBR may be relevant to considering the impacts of incidental take from activities other than commercial fisheries, using it as the sole reason to deny incidental take authorization for

those activities would be inconsistent with Congress's intent under section 101(a)(5) and the use of PBR under section 118. The standard for authorizing incidental take under section 101(a)(5) continues to be, among other things, whether the total taking will have a negligible impact on the species or stock. When Congress amended the MMPA in 1994 to add section 118 for commercial fishing, it did not alter the standards for authorizing non-commercial fishing incidental take under section 101(a)(5), acknowledging that negligible impact under section 101(a)(5) is a separate standard from PBR under section 118. In fact, in 1994 Congress also amended section 101(a)(5)(E) (a separate provision governing commercial fishing incidental take for species listed under the Endangered Species Act) to add compliance with the new section 118 but kept the requirement for a negligible impact finding, showing that the determination of negligible impact and application of PBR may share certain features but are different.

Since the introduction of PBR, NMFS has used the concept almost entirely within the context of implementing sections 117 and 118 and other commercial fisheries management-related provisions of the MMPA. The MMPA requires that PBR be estimated in stock assessment reports and that it be used in applications related to the management of take incidental to commercial fisheries (*i.e.*, the take reduction planning process described in section 118 of the MMPA and the determination of whether a stock is "strategic" (16 U.S.C. 1362(19))), but nothing in the MMPA requires the application of PBR outside the management of commercial fisheries interactions with marine mammals.

Nonetheless, NMFS recognizes that as a quantitative metric, PBR may be useful in certain instances as a consideration when evaluating the impacts of other human-caused activities on marine mammal stocks. Outside the commercial fishing context, and in consideration of all known human-caused mortality, PBR can help inform the potential effects of M/SI caused by activities authorized under 101(a)(5)(A) on marine mammal stocks. As noted by NMFS and the USFWS in our implementation regulations for the 1986 amendments to the MMPA (54 FR 40341, September 29, 1989), the Services consider many factors, when available, in making a negligible impact determination, including, but not limited to, the status of the species or stock relative to OSP (if known), whether the recruitment rate for the species or stock is increasing, decreasing, stable, or unknown, the size and distribution of the population, and existing impacts and environmental conditions. To specifically use PBR, along with other factors, to evaluate the effects of M/SI, we first calculate a metric for each species or stock that incorporates information regarding ongoing anthropogenic M/SI into the PBR value (*i.e.*, PBR minus the total annual anthropogenic mortality/serious injury estimate), which is called "residual PBR." (Wood *et al.*, 2012). We then consider how the anticipated potential incidental M/SI from the activities being evaluated compares to residual PBR. Anticipated or potential M/SI that exceeds residual PBR is considered to have a higher likelihood of adversely affecting rates of recruitment or survival, while anticipated M/SI that is equal to or less than residual PBR has a lower likelihood (both examples given without consideration of other types of take, which also obviously factor into a negligible impact determination). In such cases where the anticipated M/SI is near, at, or above PBR, consideration of other factors, including those outlined above as well as mitigation and other factors (positive or negative), is especially important to assessing whether the M/SI will have a negligible impact on the stock. As described above, PBR is a conservative metric and is not intended to be used as a solid cap on mortality—accordingly, impacts from M/SI that exceed PBR may still potentially be found to be negligible in light of other factors that offset concern, especially when robust mitigation and adaptive management provisions are included.

Alternately, for a species or stock with incidental M/SI less than 10 percent of residual PBR, we consider M/SI from the specified activities to represent an insignificant incremental increase in ongoing anthropogenic M/SI that alone (*i.e.*, in the absence of any other take) cannot affect annual rates of recruitment and survival. In a prior incidental take rulemaking and in the commercial fishing context, this threshold is identified as the significance threshold, but it is more accurately an insignificance threshold outside commercial fishing because it represents the level at which there is no need to consider other factors in determining the role of M/SI in affecting rates of recruitment and survival. Assuming that any additional incidental take by harassment would not exceed the negligible impact level, the anticipated M/SI caused by the activities being evaluated would have a negligible impact on the species or stock. This 10% was identified as a workload simplification consideration to avoid the need to provide unnecessary additional information when the conclusion is relatively obvious, but as described above, values above 10 percent have no particular significance associated with them until and unless they approach residual PBR.

Our evaluation of the M/SI for each of the species and stocks for which mortality could occur follows. In addition, all mortality authorized for some of the same species or stocks over the next several years pursuant to our final rulemaking for the NMFS Southwest and Pacific Islands Fisheries Science Centers has been incorporated into the residual PBR.

We first consider maximum potential incidental M/SI from Navy's ship strike analysis for the affected mysticetes and sperm whales (see Table 67) and from the Navy's explosive detonations for California sea lions and short-beaked common dolphin (see Table 68) in consideration of NMFS's threshold for identifying insignificant M/SI take (10 percent of residual PBR (69 FR 43338; July 20, 2004)). By considering the maximum potential incidental M/SI in relation to PBR and ongoing sources of anthropogenic mortality, we begin our evaluation of whether the potential incremental addition of M/SI through Navy's ship strikes and explosive detonations may affect the species' or stocks' annual rates of recruitment or survival. We also consider the interaction of those mortalities with incidental taking of that species or stock by harassment pursuant to the specified activity.

Based on the methods discussed previously, NMFS believes that mortal takes of three large whales over the course of the five-year rule, with no more than two from any of the following species/stocks over the five-year period: Gray whale (Eastern North Pacific stock), fin whale (CA/OR/WA stock), humpback whale (CA/OR/WA stock or Mexico DPS), humpback whale (Central Pacific stock or Hawaii DPS) and sperm whale (Hawaiian stock). Of the mortal takes of three large whales that could occur, no more than one mortality would occur from any of the following species/stocks over the five-year period: Blue whale (Eastern North Pacific stock), Bryde's whale (Eastern Tropical Pacific stock), Bryde's whale (Hawaiian stock), humpback whale (CA/OR/WA stock or Central America DPS), minke whale (CA/OR/WA stock), minke whale (Hawaiian stock), sperm whale (CA/OR/WA stock), sei whale (Hawaiian stock), and sei whale (Eastern North Pacific

stock). The Navy is not requesting, and we do not anticipate, ship strike takes to blue whale (Central North Pacific stock), fin whale (Hawaiian stock), and gray whale (Western North Pacific stock) due to their relatively low occurrence in the Study Area, in particular core HSTT training and testing subareas. This means an annual average of 0.2 whales from each species or stock where one mortality may occur or an annual average of 0.4 whales from each species or stock where two mortalities may occur as described in Table 67 (*i.e.*, 1 or 2 takes over 5 years divided by 5 to get the annual number) is proposed for authorization.

The Navy has also requested a small number of takes by serious injury or mortality from explosives. To calculate the annual average of mortalities for explosives in Table 68 we used the same method as described for vessel strikes. The annual average is the number of takes divided by five years to get the annual number.

TABLE 67—SUMMARY INFORMATION RELATED TO MORTALITIES REQUESTED FOR SHIP STRIKE, 2018–2023

Species (stock)	Stock abundance (Nbest) *	Annual proposed take by serious injury or mortality [1]	Total annual M/SI * [2]	Fisheries interactions (Y/N); annual rate of M/SI from fisheries interactions *	Vessel collisions (Y/N); annual rate of M/SI from vessel collision *	PBR *	Residual PBR–PBR minus annual M/SI and SWFSC authorized take (%) [3]	Stock trend * [4]	Recent UME (Y/N); number and year (since 2007)
Fin whale (CA/OR/WA)	9,029	0.4	≥2.0	Y; ≥2.0	1.8	81	78	↑	N
Gray whale (Eastern N Pacific).	20,990	0.4	132	4.25	2.0	624	492	Stable since 2003	N
Humpback whale (CA/OR,WA stock or Mexico DPS).	1,918	0.4	≥6.5	Y; ≥5.3	1.0	11.0	4.5	↑	N
Humpback whale (Central North Pacific stock or Hawaii DPS).	10,103	0.4	24	Y; 7.4	4.7	83	59	↑	N
Sperm whale (Hawaiian stock)	3,354	0.4	0.7	0.7	0	10.2	9.5	?	N
Blue whale (Eastern North Pacific stock).	1,647	0.2	0.9	0	0.9	2.3	1.4	stable	Y; 3, 2007.
Bryde's whale (Eastern Tropical Pacific stock).	unknown	0.2	0.2	unknown	0.2	undet	NA	?	N
Bryde's whale (Hawaiian stock).	798	0.2	0	0	0	6.3	6.3	?	N
Humpback whale (CA/OR/WA stock or Central America DPS).	1,918	0.4	≥6.5	Y; ≥5.3	1.0	11.0	4.5	↑	N
Minke whale (CA/OR/WA stock).	636	0.2	≥1.3	≥1.3	0	3.5	2.2	?	N
Minke whale (Hawaiian stock)	unknown	0.2	0	0	0	undet	NA	?	N
Sperm whale (CA/OR/WA stock).	2,106	0.2	1.7	1.7	0	2.7	1.0	?	N
Sei whale (Hawaiian stock)	178	0.2	0.2	0.2	0	0.2	0	?	N
Sei whale (Eastern N Pacific stock).	519	0.2	0	0	0	0.75	0.75	?	N

* Presented in the SARS.
[1] This column represent the annual take by serious injury or mortality by vessel collision and was calculated by the number of mortalities proposed for authorization divided by five years (the length of the rule and LOAs).
[2] This column represents the total number of incidents of M/SI that could potentially accrue to the specified species or stock. This number comes from the SAR, but deducts the takes accrued from either Navy strikes or SWFSC takes to ensure not double-counted against PBR. However, for these species, there were no takes from either Navy or SWFSC to deduct that would be considered double-counting.
[3] This value represents the calculated PBR less the average annual estimate of ongoing anthropogenic mortalities (*i.e.*, total annual human-caused M/SI, which is presented in the SARs).
[4] See relevant SARs for more information regarding stock status and trends.

The following species are being requested for mortality takes from explosions. A total of 10 mortalities: 4 California sea lions and 6 short-beaked common dolphins over the 5-year period (therefore 0.8 mortalities annually for California sea lions and 1.2 mortalities annually for short-beaked common dolphin) are described in Table 68.

TABLE 68—SUMMARY INFORMATION RELATED TO MORTALITIES FROM EXPLOSIVES, 2018–2023

Species (stock)	Stock abundance (Nbest) *	Annual proposed take by serious injury or mortality * [1]	Total annual M/SI * [2]	Fisheries interactions (Y/N); annual rate of M/SI from fisheries interactions *	PBR *	SWFSC authorized take (annually) [3]	Residual PBR–PBR minus annual M/SI and SWFSC [4]	Stock trend * [5]	Recent UME (Y/N); number and year
California sea lion (U.S.)	296,750	0.8	385	Y; 331	9,200	6.6	8,808.4	↑	Y
Short-beaked common dolphin (CA/OR/WA).	969,861	1.2	≥40	Y; ≥40	8,393	2.8	8,350.2	?	N

* Presented in the SARS.
[1] This column represents the annual take by serious injury or mortality during explosive detonations and was calculated by the number of mortalities proposed for authorization divided by five years (the length of the rule and LOAs).

[2] This column represents the total number of incidents of M/SI that could potentially accrue to the specified species or stock. This number comes from the SAR, but deducts the takes accrued from either Navy or NMFS's Southwest Fisheries Science Center (SWFSC) rulemaking/LOAs takes to ensure not double-counted against PBR.
[3] This column represents annual take authorized for NMFS's SWFSC rulemaking/LOAs (80 FR 58982).
[4] This value represents the calculated PBR less the average annual estimate of ongoing anthropogenic mortalities (*i.e.*, total annual human-caused M/SI, which is presented in the SARs).
[5] See relevant SARs for more information regarding stock status and trends.

Species With M/SI Below the Insignificance Threshold

As noted above, for a species or stock with incidental M/SI less than 10 percent of residual PBR, we consider M/SI from the specified activities to represent an insignificant incremental increase in ongoing anthropogenic M/SI that alone (*i.e.*, in the absence of any other take) cannot affect annual rates of recruitment and survival. There are no known factors that could affect a species or stock to the point where anticipated M/SI below the insignificance threshold could have effects on annual rates of recruitment or survival. In this case, as shown in Table 67, the following species or stocks have anticipated, and proposed authorized, M/SI below their insignificance threshold and, therefore, additional factors are not discussed: Fin whale (CA/OR/WA), gray whale (Eastern North Pacific), Humpback whale (CA/OR/WA stock or Mexico DPS), humpback whale (Central Pacific stock or Hawaii DPS), sperm whale (Hawaiian stock), Bryde's whale (Hawaiian stock), humpback whale (CA/OR/WA stock or Central America DPS), minke whale (CA/OR/WA stock), California sea lion (U.S.), and short-beaked common dolphin (CA/OR/WA stock). For the remaining six stocks with anticipated potential M/SI, how that M/SI compares to residual PBR, as well as additional factors, as appropriate, are discussed below.

Sperm Whale (California, Oregon, Washington Stock)

For sperm whales (CA/OR/WA stock), PBR is currently 2.7 and the total annual M/SI is 1.7 and yields a residual PBR of 1.0. The M/SI value includes incidental fishery interaction records of 1.7, and records of vessel collisions of 0. The proposed authorization of 0.2 mortalities represents 20 percent of residual PBR. Because this value is not close to, at, or exceeding residual PBR, it means that the proposed M/SI is not expected to result in more than a negligible impact on this stock, however, we still address other factors, where available. In regard to mitigation measures that may lessen other human-caused mortality in the future, NOAA is currently implementing marine mammal take reduction measures as identified in the Pacific Offshore Cetacean Take Reduction Plan (including acoustic pingers) to reduce bycatch and incidental serious injury and mortality of sperm whales, and other whales in the CA/OR swordfish drift gillnet fishery. There have been few observed interactions with sperm whales since the fishery was observed, both pre and post-take reduction plan, however, pingers are within the hearing range of sperm whales, and we can infer that they may play a part in reducing sperm whale interactions in this fishery. This information will be considered in combination with our assessment of the impacts of harassment takes later in the section.

Blue Whale (Eastern North Pacific Stock)

For blue whales (Eastern North Pacific stock), PBR is currently set at 2.3 and the total annual M/SI of 0.9 yielding a residual PBR of 1.4. The M/SI value includes incidental fishery interaction records of 0, and records of vessel collisions of 0.9. The proposed authorization of 0.2 represents 14 percent of residual PBR. Because this value is not close to, at, or exceeding residual PBR, it means that the proposed M/SI is not expected to result in more than a negligible impact on this stock, however, we still address other factors, where available. We note that the Eastern North Pacific blue whale stock is considered stable.

In regard to mitigation that may lessen other human-caused mortality in the future, NOAA is currently implementing marine mammal take reduction measures as identified in the Pacific Offshore Cetacean Take Reduction Plan (including the use of acoustic pingers) to reduce the bycatch of blue whales and other marine mammals. In addition, the Channel Islands NMS staff coordinates, collects and monitors whale sightings in and around the Whale Advisory Zone and the Channel Islands NMS region. The seasonally established Whale Advisory Zone spans from Point Arguello to Dana Point, including the Traffic Separation Schemes in the Santa Barbara Channel and San Pedro Channel. Vessels transiting the area from June through November are recommended to exercise caution and voluntarily reduce speed to 10 kn or less for blue, humpback and fin whales. Channel Island NMS observers collect information from aerial surveys conducted by NOAA, the U.S. Coast Guard, California Department of Fish and Game, and U.S. Navy chartered aircraft. Information on seasonal presence, movement and general distribution patterns of large whales is shared with mariners, NMFS Office of Protected Resources, U.S. Coast Guard, California Department of Fish and Game, the Santa Barbara Museum of Natural History, the Marine Exchange of Southern California, and whale scientists. Real time and historical whale observation data collected from multiple sources can be viewed on the Point Blue Whale Database. This information will be considered in combination with our assessment of the impacts of harassment takes later in the section.

Sei Whale (Eastern North Pacific Stock)

For sei whales (*Eastern North Pacific stock*) PBR is currently set at 0.75 and the total annual M/SI is 0 yielding a residual PBR of 0.75. The M/SI value includes incidental fishery interaction records of 0, and records of vessel collisions of 0. The proposed authorization of 0.2 mortalities annually represents 26 percent of residual PBR. Because this value is not close to, at, or exceeding residual PBR, it means that the proposed M/SI is not expected to result in more than a negligible impact on this stock. This information will be considered in combination with our assessment of the impacts of harassment takes later in the section.

Sei Whale (Hawaiian Stock)

For sei whales (*Hawaiian stock*) PBR is currently set at 0.2 and the total annual M/SI is 0.2 yielding a residual PBR of 0. The M/SI value includes incidental fishery interaction records of 0.2, and records of vessel collisions of 0. The proposed authorization of 0.2 mortalities is above residual PBR (by 0.2). We note, however, that this stock occurs within the Hawaiian Islands EEZ and in adjacent high seas waters; however, because data on abundance, distribution, and human-caused impacts are largely lacking for high seas waters, the status of this stock is evaluated based on data from U.S. EEZ waters (NMFS 2005). If the higher number of whales in the high seas (which are uncounted) are considered in combination with the lower likely numbers of mortality in the high seas (since the only known mortality is from

fishery interaction, which occurs predominantly in the U.S. EEZ), then the current PBR is likely overly conservative in the context of M/SI takes that could occur in or outside of the U.S. EEZ. Additionally, as noted in the discussion above, PBR is a conservative metric that is not intended to serve as an absolute cap on authorized mortality, one mortality is the smallest amount that could possibly occur in a five-year period, and when this fractional addition is considered in the context of barely exceeding residual PBR, any impacts on the stock are not expected to be more than negligible. This information will be considered in combination with our assessment of the impacts of harassment takes later in the section.

Bryde's Whale (Eastern Tropical Pacific Stock)

For Bryde's whales (Eastern Tropical Pacific stock) PBR is currently undetermined and the total annual M/SI is 0.2. Therefore, residual PBR is unknown. The M/SI value includes incidental fishery interaction records which are unknown, and records of vessel collisions are 0.2. The total human-caused mortality is very low and the Navy's activities would add a fractional amount. Given the fact that this stock contains animals that reside both within and outside the U.S. EEZ (a very large range) and there known M/SI of only 0.2, it is unlikely that the addition of 0.2 annual mortality would result in more than a negligible impact on this stock. This information will be considered in combination with our assessment of the impacts of harassment takes later in the section.

Minke Whale (Hawaiian Stock)

For minke whales (Hawaiian stock) PBR is currently undetermined and the total annual M/SI is unknown; therefore, residual PBR is unknown. The M/SI value includes incidental fishery interaction records of 0, and records of vessel collisions of 0. Given the fact that this stock contains animals that reside both within and outside the U.S. EEZ (a very large range) and there is no known M/SI, it is unlikely that the addition of 0.2 annual mortality would result in more than a negligible impact on this stock. This information will be considered in combination with our assessment of the impacts of harassment takes later in the section.

Group and Species-Specific Analysis

In the discussions below, the "acoustic analysis" refers to the Navy's analysis, which includes the use of several models and other applicable calculations as described in the Estimated Take of Marine Mammals section. The quantitative analysis process used for the HSTT DEIS/OEIS and the Navy's rulemaking/LOA application to estimate potential exposures to marine mammals resulting from acoustic and explosive stressors is detailed in the technical report titled *Quantifying Acoustic Impacts on Marine Mammals and Sea Turtles: Methods and Analytical Approach for Phase III Training and Testing report* (U.S. Department of the Navy, 2017b). The Navy Acoustic Effects Model estimates acoustic and explosive effects without taking mitigation into account. Therefore, the model overestimates predicted impacts on marine mammals within mitigation zones. To account for mitigation, as well as avoidance, for marine mammals, the Navy developed a methodology to conservatively quantify the likely degree that mitigation and avoidance will reduce model-estimated PTS to TTS for exposures to sonar and other transducers, and reduce model-estimated mortality and injury for exposures to explosives.

The amount and type of incidental take of marine mammals anticipated to occur from exposures to sonar and other active acoustic sources and explosions during the five-year training and testing period are shown in Tables 41 and 42. The vast majority of predicted exposures (greater than 99 percent) are expected to be Level B harassment (non-injurious TTS and behavioral reactions) from acoustic and explosive sources during training and testing activities at relatively low received levels.

The analysis below may in some cases (*e.g.*, mysticetes, porpoises, pinnipeds) address species collectively if they occupy the same functional hearing group (*i.e.*, low, mid, and high-frequency cetaceans and pinnipeds in water), have similar hearing capabilities, and/or are known to generally behaviorally respond similarly to acoustic stressors. Animals belonging to each stock within a species would have the same hearing capabilities and behaviorally respond in the same manner as animals in other stocks within the species. Therefore, our analysis below also considers the effects of Navy's activities on each affected stock. Where there are meaningful differences between species or stocks in anticipated individual responses to activities, impact of expected take on the population due to differences in population status, or impacts on habitat, they will either be described within the section or the species will be included as a separate sub-section.

Mysticetes

In Table 69 and Table 70 below, for mysticetes, we indicate the total annual mortality, Level A and Level B harassment, and a number indicating the instances of total take as a percentage of abundance. Overall, takes from Level A harassment (PTS and Tissue Damage) account for less than one percent of all total takes.

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Table 69. Annual takes of Level B and Level A harassment, mortality for mysticetes in the HRC of the HSTT study area and number indicating the instances of total take as a percentage of stock abundance.

	Level B Harassment		Level A Harassment			Total Takes		Abundance		Instance of total take as percent of abundance	
Species Stock Navy EEZ location (HRC)	Behavioral Disturbance	TTS (may also include disturbance)	PTS	Tissue Damage	Mortality	TOTAL TAKES (entire Study Area)	Takes (within NAVY EEZ)	Total Navy Abundance in and out EEZ (HRC)	Within Navy EEZ Abundance HRC	Total take as percentage of total Navy abundance (HRC)	EEZ take as percentage of EEZ abundance (HRC)
Blue whale Central North Pacific (HRC)	15	33	0	0	0	48	40	43	33	112	121
Bryde's whale Hawaiian (HRC)	80	107	0	0	0	147	123	108	89	136	138
Fin whale Hawaiian (HRC)	21	28	0	0	0	49	41	52	40	94	103
Humpback whale Central North Pacific (HRC)	2838	6290	5	0	0	9133	7589	5078	4595	180	165
Minke whale Hawaiian (HRC)	1233	3697	2	0	0	4932	4038	3652	2835	135	142
Sei whale Hawaiian (HRC)	47	121	0	0	0	168	135	138	107	122	126

Note: For the EEZ take estimates, we compare predicted takes to abundance estimates generated from the same underlying density estimates, both in and outside of the U.S. EEZ. Because the portion of the Navy's action area inside the U.S. EEZ is generally concomitant with the study area used to generate the abundance estimates in the SARs, and the abundance predicted by the same underlying density estimates is the preferred abundance to use, there is no need to separately compare the take to the SARs abundance estimate.

Table 70. Annual takes of Level B and Level A harassment, mortality for mysticetes in the SOCAL of the HSTT study area and number indicating the instances of total take as a percentage of stock abundance.

		Instances of indicated types of incidental take (not all takes represent separate individuals, especially for disturbance)									
		Level B Harassment		Level A Harassment			Total Takes	Abundance		Instance of total take as percent of abundance	
Species	Stock	Behavioral Disturbance	TTS (may also include disturbance)	PTS	Tissue Damage	Mortality	TOTAL TAKES (entire Study Area)	NAVY abundance in Action Area SOCAL [1]	NMFS SARS [2]	Total take as percentage of total Navy abundance in Action Area	Total take as percentage of total SAR abundance
Blue whale	Eastern North Pacific	792	1196	1	0	0	1989	785	1647	253	121
Bryde's whale	Eastern Tropical Pacific	14	27	0	0	0	41	1.3	unknown	3154	unknown
Fin whale	CA/OR/WA	835	1390	1	0	0	2226	363	9029	613	25
Humpback whale	CA/OR/WA	480	1514	1	0	0	1995	247	1918	808	104
Minke whale	CA/OR/WA	259	666	1	0	0	926	163	636	568	146
Sei whale	Eastern North Pacific	27	52	0	0	0	79	3	519	2633	15
Gray whale	Eastern North Pacific	1316	3355	7	0	0	4678	193	20990	2424	22
Gray whale	Western North Pacific	2	4	0	0	0	6	0	140	0	4

Note: For the SOCAL take estimates, because of the manner in which the Navy action area overlaps the ranges of many MMPA stocks (*i.e.*, a stock may range far north to Washington state and beyond and abundance may only be predicted within the U.S. EEZ, while the Navy action area is limited to Southern California and northern Mexico, but extends beyond the U.S. EEZ), we compare predicted takes to both the abundance estimates for the action area, as well as the SARs.

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Of these species, blue whale, fin whale, sei whale, humpback whale (CA/OR/WA stock) and gray whale (Western North Pacific stock) are listed as endangered under the ESA and depleted under the MMPA. NMFS is currently engaged in an internal Section 7 consultation under the ESA and the outcome of that consultation will further inform our final decision.

Of the total instances of all of the different types of takes, the numbers indicating the instances of total take as a percentage of abundance for mysticetes ranges from 94 to 180 percent for HRC stocks (blue, Bryde's, fin, humpback minke and sei whales), suggesting that most individuals are taken in an average of 1 to 2 days per year (Table 69). For SOCAL stocks (blue, Bryde's, fin, humpback, minke, sei, and gray whales), the percentages as compared to the abundances across the U.S. EEZ stock range (Predicted in the SAR) are between 4 and 146, suggesting that across these wide-ranging stocks individuals are taken on average on between 0 and 2 days per year (Table 70). Alternately when compared to the abundance estimates within the Navy's SOCAL action area, based on static density estimates, the percentages range from 0 to 3,154, suggesting that if any of these exposed individuals remained in the action area the whole year, they might be taken on average on 32 days in a year. Although we generally do not expect individuals to remain in the action area for the whole year (or to accrue take over this many days), these numbers do suggest that individuals residing in the action area for some amount of time could accrue take on more than the average one or two days per year. Effects are such that these averages allow that perhaps a smaller subset is taken with a slightly higher average and larger variability of highs and lows, but still with no reason to think that any individuals would be taken every day for weeks or months out of the year, much less on sequential days. These behavioral takes are expected to be of a milder to potentially moderate intensity and are not likely to occur over sequential days, which suggests that the overall scale of impacts for any individual would be relatively low and unlikely to result in fitness effects that would impact reproductive success or survival.

Most Level B harassments to mysticetes from hull-mounted sonar (MF1) in the HSTT Study Area would result from received levels between 154 and 172 dB SPL (62 percent). As mentioned earlier in this section, we anticipate more severe effects from takes when animals are exposed to higher received levels. Comparatively minor to potentially moderate behavioral reactions are unlikely to cause long-term consequences for individual animals or populations, and even if some smaller subset of the takes are in the form of a longer (several hours or a day) and more moderate response, because they are not expected to be repeated over sequential multiple days, impacts to individual fitness are not anticipated. Also, as noted in the Potential Effects section, while there are multiple examples from behavioral response studies of odontocetes ceasing their feeding dives when exposed to sonar pulses at certain levels, but alternately, blue whales were

less likely to show a visible response to sonar exposures at certain levels when feeding then they have been observed responding to when traveling.

Research and observations show that if mysticetes are exposed to sonar or other active acoustic sources they may react in a number of ways depending on the characteristics of the sound source, their experience with the sound source, and whether they are migrating or on seasonal grounds (*i.e.*, breeding or feeding). Behavioral reactions may include alerting, breaking off feeding dives and surfacing, diving or swimming away, or no response at all (Richardson, 1995; Nowacek, 2007; Southall *et al.*, 2007; Finneran and Jenkins, 2012). Overall, mysticetes have been observed to be more reactive to acoustic disturbance when a noise sources is located directly on their migration route. Mysticetes disturbed while migrating could pause their migration or route around the disturbance. Although they may pause temporarily, they will resume migration shortly after. Animals disturbed while engaged in other activities such as feeding or reproductive behaviors may be more likely to ignore or tolerate the disturbance and continue their natural behavior patterns. Therefore, most behavioral takes of mysticetes are likely to be short-term and low to moderate severity.

While MTEs may have a longer duration, they are not concentrated in small geographic areas over that time period. MTES use hundreds of square miles of ocean space during the course of the event. For example, Goldbogen *et al.* (2013) indicated some horizontal displacement of deep foraging blue whales in response to simulated MFA sonar. Given these animals' mobility and large ranges, we would expect these individuals to temporarily select alternative foraging sites nearby until the exposure levels in their initially selected foraging area have decreased. Therefore, temporary displacement from initially selected foraging habitat is not expected to impact the fitness of any individual animals because we would expect suitable foraging to be available in close proximity.

Richardson *et al.* (1995) noted that avoidance (temporary displacement of an individual from an area) reactions are the most obvious manifestations of disturbance in marine mammals. Avoidance is qualitatively different from the startle or flight response, but also differs in the magnitude of the response (*i.e.*, directed movement, rate of travel, etc.). Oftentimes avoidance is temporary, and animals return to the area once the noise has ceased. Some mysticetes may avoid larger activities such as a MTE as it moves through an area, although these activities generally do not use the same training locations day-after-day during multi-day activities. Therefore, displaced animals could return quickly after the MTE finishes. Due to the limited number and broad geographic scope of MTEs, it is unlikely that most mysticetes would encounter a major training exercise multiple times per year when transiting through the area. In the ocean, the use of sonar and other active acoustic sources is transient and is unlikely to expose individuals repeatedly over a short period except around homeports and fixed instrumented ranges. However, the more impactful training exercises that result in higher numbers or more severe forms of take do not occur around homeports. While training exercises may be concentrated in instrumented ranges, they are large areas, and in most cases the animals are not limited to those areas and the numbers in the analysis above do not suggest that any individual mysticetes are being exposed to levels above the Level B harassment threshold within more than than maybe 20–30 days at most over the course of a year.

The implementation of mitigation and the sightability of mysticetes (due to their large size) and therefore higher likelihood that shutdown and other mitigation measures will be effective for these species and reduces the potential for a more significant behavioral reaction or a threshold shift to occur (which would be more likely within the shutdown zone, were the mitigation not implemented). As noted previously, when an animal incurs a threshold shift, it occurs in the frequency from that of the source up to one octave above—this means that threshold shift caused by Navy sonar sources will typically occur in the range of 2–20 kHz, and if resulting from hull-mounted sonar, will be in the range of 3.5–7 kHz. The majority of mysticete vocalizations occur in frequencies below 1 kHz, which means that TTS incurred by mysticetes will not interfere with conspecific communication. When we look in ocean areas where the Navy has been intensively training and testing with sonar and other active acoustic sources for decades, there is no data suggesting any long-term consequences to mysticetes from exposure to sonar and other active acoustic sources.

The Navy will implement mitigation areas that will avoid or reduce impacts to mysticetes and where BIAs for large whales have been identified in the SOCAL portion of the HSTT Study Area. The Navy will implement the San Diego Arc Mitigation Area from June 1 through October 31 to protect blue whales. The San Diego Arc overlaps the San Diego Blue Whale Feeding Area (BIA) (see also the HSTT DEIS/OEIS Section K.4 (BIAs within the SOCAL Portion of the HSTT Study Area for blue whale feeding areas)). In the San Diego Arc Mitigation Area the Navy will not exceed 200 hrs of MFAS sensor MF1 use ((with the exception of active sonar maintenance and systems checks) between June 1 and October 31 annually. Additionally, in the San Diego Arc Mitigation Area, the Navy will not use explosives during large-caliber gunnery, torpedo, bombing, and missile (including 2.75 in rockets) activities during training or testing.

In addition, the Navy will implement the Santa Barbara Island Mitigation Area year-round for the protection of blue, fin, and gray whales (and other marine mammals) within that portion of the Channel Islands NMS. The Santa Barbara Island Mitigation Area will partially protect the identified important feeding area, San Nicolas Island for blue whales. The Navy will restrict the use of MFAS sensor MF1 and explosives used in gunnery (all calibers), torpedo, bombing, and missile exercises (including 2.75 in rockets) during unit-level training and MTEs.

The Navy will implement mitigation areas that will avoid or reduce impacts to mysticetes and where BIAs for large whales have been identified in the HRC portion of the HSTT Study Area as described below.

In the 4-Islands Region Mitigation Area, the Navy will not use MFAS sensor MF1 during training or testing activities from November 15 through April 15. Since 2009, the Navy has adhered to a Humpback Whale Cautionary Area as a mitigation area within the Hawaiian Islands Humpback Whale NMS an area identified as having one of the highest concentrations of humpback whales, with calves, during the critical winter months. As added protection, the Navy proposes to expand the size and extend the season of the current Humpback Whale Cautionary Area, renaming this area the 4-Islands Region Mitigation Area to reflect the benefits afforded to multiple species. The season is currently between December 15 and April 15; the Navy proposes to extend it from November 15 through April 15 because the peak humpback whale season has expanded. The size of the 4-Islands Region Mitigation Area would expand to include an area north of Maui and Molokai and overlaps an area identified as a BIA for the critically endangered Main Hawaiian Islands insular false

killer whales (Baird *et al.*, 2015; Van Parijs, 2015) (see Figure 5.4–3, in Chapter 5 Mitigation Areas for Marine Mammals in the Hawaii Range Complex of the HSTT DEIS/OEIS). This proposed measure to include the additional area north of Maui and Molokai for this 4-Islands Region Mitigation Area further reduces impacts to humpback whales (and false killer whales).

Within the 4-Islands Region Mitigation Area is the Hawaiian Island Humpback Whale Reproduction Area BIA (4-Islands Region and Penguin Bank). The use of sonar and other transducers primarily occur farther offshore than the designated boundaries of the Hawaiian Islands Humpback Whale Reproduction Area BIA. Explosive events are typically conducted in areas that are designated for explosive use, which are areas outside of the Hawaiian Islands Humpback Whale Reproduction Area BIA.

The restrictions on MFAS sensor MF1 in this area and the fact that the Navy does not plan to use any explosives in this area means that the number of takes of humpback whales will be lessened, as will their potential severity, in that the Navy is avoiding exposures in an area and time where they would be more likely to interfere with cow/calf communication or potentially heightened impacts on sensitive or naïve individuals (calves).

The Navy is also proposing an additional mitigation area, the Hawaii Island Mitigation Area. The Hawaii Island Mitigation Area would be established where year-round, where the Navy will not use more than 300 hrs of MFAS sensory MF1 and will not exceed 20 hrs of MFAS senory MF4 year-round. Also within the Hawaii Island Mitigation Area, the Navy will not use any explosives (*e.g.*, surface-to-surface or air-to-surface missile and gunnery events, BOMBEX, and mine neutralization) during testing and training year-round. Of note here, this measure would provide additional protection in this important reproductive area for humpback whales, reducing impacts in an area and time where they would likely be more severe if incurred. Separately (and addressed more later), these protected areas also reduce impacts for identified biologically important areas for endangered Main Hawaiian Islands insular false killer whales, two species of beaked whales (Cuvier and Blainville's), dwarf sperm whale, pygmy killer whale, melon-headed whale, short-finned pilot whale, and dolphin species (Baird *et al.*, 2015; Van Parijs, 2015).

The 4-Islands Region Mitigation Area and the Hawaii Island Mitigation Area both also overlap with portions of the Hawaiian Islands Humpback Whale NMS. It is also of note that Navy training and testing in the Hawaiian Islands Humpback Whale NMS will follow the procedural mitigation measure that humpbacks are not approached within 100 yds and aircraft operate above 1,000 ft, which further lessens the likelihood of ship strike and behavioral disturbance resulting from aircraft, respectively.

The Navy will continue to issue an annual humpback whale awareness notification message to remind ships and aircraft to be extra vigilant during times of high densities of humpback whales while in transit and to maintain certain distances from animals during the operation of ships and aircraft.

In summary and as described above, the following factors primarily support our preliminary determination that the impacts resulting from Navy's activities are not expected to adversely affect the mysticetes stocks through effects on annual rates of recruitment or survival.

- As described in the "Serious Injury or Mortality" section above, between zero and two serious injuries or mortalities over the five-year period could occur for large whales (see Tables 67) depending on the species.
  - Using PBR as a consideration in assessing these possible mortalities, the possible mortality for fin whale (CA/OR/WA), gray whale (Eastern North Pacific stock), humpback whales (CA/OR/WA and Central Pacific stocks), Bryde's whale (Hawaiian stock), and Minke whale (CA/OR/WA stock) is below the insignificance threshold of 10 percent of residual PBR.
  - The possible total mortality for sperm whale (CA/OR/WA stock), blue whale (Eastern North Pacific Stock) and sei whales (Eastern North Pacific stock) is below residual PBR.
  - The possible total mortality for sei whale (Hawaiian stock) is equal to PBR, which places it slightly above residual PBR because of the other known human mortality. PBR is a conservative metric that is not intended to serve as an absolute cap on authorized mortality. One mortality is the smallest amount that could possibly occur in a five-year period, and when this fractional addition is considered in the context of barely exceeding residual PBR, any impacts on the stock are not expected to be more than negligible.
  - While residual PBR is not known for minke whales (Hawaiian stock) and Bryde's whales (Eastern Tropical Pacific stock), very little other human-caused mortality is known for either stock, and the Navy's activities would add a fractional amount to these wide-ranging stocks.
- As described above, any PTS that may occur is expected to be of a small degree, and any TTS of a relatively small degree because of the unlikelihood that animals would be close enough for a long enough period of time to incur more severe PTS (from sonar) and the anticipated effectiveness of mitigation in preventing very close exposures for explosives, as discussed above. Further, as noted above, any threshold shift incurred from sonar would be in the frequency range of 2–20 kHz, which is above the frequency of the majority of mysticete vocalizations, and therefore would not be expected to interfere with conspecific communication.
- While the majority of harassment takes are caused by exposure during ASW activities, the impacts from these exposures are not expected to be significant and are generally expected to be short-term because (and as discussed above):
  - ASW activities typically involve fast-moving assets (relative to marine mammal swim speeds) and individuals are not expected to be exposed either for long periods within a day or over many sequential days.
  - The majority of the harassment takes result from hull-mounted sonar during MTEs. When distance cut offs for mysticetes are applied, this means that all of the takes from hull-mounted sonar (MF1) result from above exposure 154 dB. However, the majority (*e.g.*, 62 percent) of the takes results from exposures below 172 dB. The majority of the takes are not from higher level exposures from which more severe responses would be expected.
  - As described in more detail above, the scale of effects are such that most individuals of the HRC stocks are taken in an average of 1 or 2 days per year and individuals of the SOCAL stocks are taken an average of a few days per year, with the likelihood that some smaller subset might be taken in notably more than a few days per year, but likely something less than 6–32 days per year, but, given this number of takes spread across a year and the nature of the Navy's activities, these takes are not expected to typically occur over sequential days.
- The Navy is implementing mitigation areas that specifically reduce or avoid impacts to humpback whales in their important Hawaii calving area and blue whales in their California feeding areas, and further reduce impacts over all to mysticetes in several other areas, all of which is expected to reduce the

extent, and severity in certain circumstances, of impacts to mysticetes and 70 above in this section).

Consequently, the HSTT activities are not expected to adversely impact rates of recruitment or survival of any of the stocks of mysticete whales (Table 69 *Sperm Whales*

In Table 71 and Table 72 below, for sperm whales we indicate the total annual mortality, Level A and Level B harassment, and a number indicating the instances of total take as a percentage of abundance. No PTS or tissue damage is anticipated.

Table 71. Annual takes of Level B and Level A harassment, mortality for sperm whales in the HRC of the HSTT study area and number indicating the instances of total take as a percentage of stock abundance.

	Instances of indicated types of incidental take (not all takes represent separate individuals, especially for disturbance)										
	Level B Harassment		Level A Harassment		Mortality	Total Takes		Abundance		Instance of total take as percent of abundance	
Species Stock Navy EEZ location (HRC)	Behavioral Disturbance	TTS (may also include disturbance)	PTS	Tissue Damage		TOTAL TAKES (entire Study Area)	Takes (within NAVY EEZ)	Total Navy Abundance in and out EEZ (HRC)	Within Navy EEZ Abundance HRC (gray)	Total take as percentage of total Navy abundance (HRC)	EEZ take as percentage of EEZ abundance (HRC)
Sperm whale Hawaiian (HRC)	2466	30	0	0	0	1930	1317	1656	1317	151	147

Note: For the JII take estimates, we compare predicted takes to abundance estimates generated from the same underlying density estimates, both in and outside of the U.S. EEZ. Because the portion of the Navy's action area inside the U.S. EEZ is generally consonitant with the study area used to generate the abundance estimates in the SARs, and the abundance predicted by the same underlying density estimates is the preferred abundance to use, there is no need to separately compare the take to the SARs abundance estimate.

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All takes annually for sperm whales are from Level B harassment either behavioral or TTS (Tables 71 and 72 above). Sperm whales are listed as endangered under the ESA (both CA/OR/WA and Hawaii stocks) and depleted under the MMPA. NMFS is currently engaged in an internal Section 7 consultation under the ESA and the outcome of that consultation will further inform our final decision.

Most Level B harassments to sperm whales are from hull-mounted sonar (MFA) in the HSTT Study Area would result from received levels between 154 and 166 dB SPL (65 percent). Therefore, the majority of Level B takes are expected to be in the form of milder responses (*i.e.*, lower-level exposures that still rise to the level of take, but

Table 72. Annual takes of Level B and Level A harassment, mortality for sperm whales in SOCAL of the HSTT study area and number indicating the instances of total take as a percentage of stock abundance.

		Instances of indicated types of incidental take (not all takes represent separate individuals, especially for disturbance)									
		Level B Harassment		Level A Harassment			Total Takes	Abundance		Instance of total take as percent of abundance	
Species	Stock	Behavioral Disturbance	TTS (may also include disturbance)	PTS	Tissue Damage	Mortality	TOTAL TAKES (entire Study Area)	NAVY abundance in Action Area SOCAL [1]	NMFS SARS Abundance [2]	Total take as percentage of total Navy abundance in Action Area	Total take as percentage of total SAR abundance
Sperm whale	CA/OR/WA	2437	56	0	0	0	2493	273	1997	913	125

Note: For the SOCAL take estimates, because of the manner in which the Navy action area overlaps the ranges of many MMPA stocks (*i.e.*, a stock may range far north to Washington state and beyond and abundance may only be predicted within the U.S. EEZ, while the Navy action area is limited to Southern California and northern Mexico, but extends beyond the U.S. EEZ), we compare predicted takes to both the abundance estimates for the action area, as well as the SARs.

would likely be less severe in the range of responses that qualify as take). As mentioned earlier in this section, we anticipate more severe effects from takes when animals are exposed to higher received levels. Occasional mild to moderate behavioral reactions are unlikely to cause long-term consequences for individual animals or populations, and even if some smaller subset of the takes are in the form of a longer (several hours or a day) and more moderate response, because they are not expected to be repeated over sequential multiple days, impacts to individual fitness are not anticipated.

For the total instances of all of the different types of takes, the numbers indicating the instances of total take as a percentage of abundance for sperm whales are generally between 125 and 151, with 913 for the CA/OR/WA stock of sperm whales specifically when compared against the Navy's action area abundance. Based on the percentages above, most individuals are taken in an average of 1–2 days per year based on the overall abundance of these far-ranging stocks, while some sperm whale individuals that might remain in the Navy's SOCAL action area for extended periods may be taken on more like an average of nine days in a year. These averages allow that perhaps a smaller subset is taken with a slightly higher average and larger variability of highs and lows, but still with no reason to think that any individuals would be taken every day for weeks or months out of the year, much less on sequential days. The majority of these behavioral takes are expected to be of a milder intensity (compared to those that occur at higher levels) and are not likely to occur over sequential days, which suggests that the overall scale of impacts for any individual would be relatively low and unlikely to result in fitness effects that would impact reproductive success or survival.

Sperm whales have shown resilience to acoustic and human disturbance, although they may react to sound sources and activities within a few kilometers. Sperm whales that are exposed to activities that involve the use of sonar and other active acoustic sources may alert, ignore the stimulus, avoid the area by swimming away or diving, or display aggressive behavior (Richardson, 1995; Nowacek, 2007; Southall *et al.*, 2007; Finneran and Jenkins, 2012). Some (but not all) sperm whale vocalizations might overlap with the MFAS/HFAS TTS frequency range, which could temporarily decrease an animal's sensitivity to the calls of conspecifics or returning echolocation signals. However, as noted previously, NMFS does not anticipate TTS of a long duration or severe degree to occur as a result of exposure to MFAS/HFAS. Recovery from a threshold shift (TTS) can take a few minutes to a few days, depending on the exposure duration, sound exposure level, and the magnitude of the initial shift, with larger threshold shifts and longer exposure durations requiring longer recovery times (Finneran *et al.*, 2005; Mooney *et al.*, 2009a; Mooney *et al.*, 2009b; Finneran and Schlundt, 2010).

In summary and as described above, the following factors primarily support our preliminary determination that the impacts resulting from Navy's activities are not expected to adversely affect sperm whales through effects on annual rates of recruitment or survival:

- As described in the "Serious Injury or Mortality" section (Table 67), one or two mortalities over five years is proposed for authorization for sperm whales (for CA/OR/WA and Hawaiian stocks, respectively).
  - The proposed serious injury or mortality for the sperm whale (Hawaiian stock) does fall below the insignificance threshold and, therefore, we consider the addition an insignificant incremental increase to human-caused mortality.
  - The possible total serious injury or total mortality for sperm whale (CA/OR/WA stock) falls below residual PBR. NOAA is currently implementing marine mammal take reduction measures as identified in the Pacific Offshore Cetacean Take Reduction Plan that addresses incidental serious injury and mortality of sperm whales, and other whales in the CA/OR swordfish drift gillnet fishery. The total anticipated human-caused mortality is not expected to exceed PBR for both stocks.
- No PTS or injury from acoustic or explosive stressors is proposed for authorization or anticipated to occur for sperm whales.
- While the majority of takes are caused by exposure during ASW activities, the impacts from these exposures are not expected to have either significant or long-term effects because (and as discussed above):
  - ASW activities typically involve fast-moving assets (relative to marine mammal swim speeds) and individuals are not expected to be exposed either for long periods within a day or over many sequential days.
  - As discussed, the majority of the harassment takes result from hull-mounted sonar during MTEs. When distance cutoffs are applied for odontocetes, this means that all of the takes from hull-mounted sonar (MF1) result from above exposure 154 dB. However, the majority (*e.g.*, 85 percent) of the takes results from exposures below 166 dB. The majority of the takes are not from higher level exposures from which more severe responses would be expected.
- As described in more detail above (Table 71 and 72), the scale of the effects are such that for sperm whales, most individuals are take in an average of 1–2 days per year, while some subset of individuals that might remain in the Navy's SOCAL action area for extended periods could be taken on an average of 9 days per year. As described above, given this number of takes spread across a year and the nature of the Navy's activities, these takes are not expected to typically occur over sequential days.
- The HSTT activities are not expected to occur in an area/time of specific importance for reproductive, feeding, or other known critical behaviors for sperm whales and there is no designated critical habitat in the HSTT Study Area.

Consequently, the HSTT activities are not expected to adversely impact rates of recruitment or survival of any of the analyzed stocks of sperm whales (Table 73 above in this section).

Kogia spp.

In Table 73 and 74 below, for *Kogia spp.* we indicate the total annual mortality, Level A and Level B harassment, and a number indicating the instances of total take as a percentage of abundance. Overall, takes from Level A harassment (PTS and Tissue Damage) account for less than one percent of all total takes.

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Table 73. Annual takes of Level B and Level A harassment, mortality for Kogia species in the HRC of the HSTT study area and number indicating the instances of total take as a percentage of stock abundance.

	Instances of indicated types of incidental take (not all takes represent separate individuals, especially for disturbance)										
	Level B Harassment		Level A Harassment		Mortality	Total Takes		Abundance		Instance of total take as percent of abundance	
Species Stock Navy EEZ location (HRC)	Behavioral Disturbance	TTS (may also include disturbance)	PTS	Tissue Damage		TOTAL TAKES (entire Study Area)	Takes (within NAVY EEZ)	Total Navy Abundance in and out EEZ (HRC)	Within Navy EEZ Abundance HRC	Total take as percentage of total Navy abundance (HRC)	EEZ take as percentage of EEZ abundance (HRC)
Dwarf sperm whale Hawaiian (HRC)	5870	14550	64	0	0	20484	15310	8218	6379	249	240
Pygmy sperm whale Hawaiian (HRC)	2329	5822	27	0	0	8178	6098	3349	2600	244	235

Note: For the HI take estimates, we compare predicted takes to abundance estimates generated from the same underlying density estimates, both in and outside of the U.S. EEZ. Because the portion of the Navy's action area inside the U.S. EEZ is generally concomitant with the study area used to generate the abundance estimates in the SARs, and the abundance predicted by the same underlying density estimates is the preferred abundance to use, there is no need to separately compare the take to the SARs abundance estimate.

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Nearly all takes annually for Kogia species are from Level B harassment either behavioral or TTS (less than 1 percent PTS) (Tables 73 and 74 above). No serious injury, or mortalities are anticipated. These species are not ESA-listed.

Most Level B harassments to *Kogia spp.* from hull-mounted sonar (MF1) in the HSTT Study Area would result from received levels between 154 and 166 dB SPL (65 percent). Therefore, the majority of Level B takes are expected to be in the form of milder responses (as compared to higher level exposures). As mentioned earlier in this section, we anticipate more severe effects from takes when animals are exposed to higher received levels.

For the total instances of all of the different types of takes, the numbers indicating the instances of total take as a percentage of abundance for *Kogia* whales are generally between 223 and 249, with 1,211 for the CA/OR/WA

Table 74. Annual takes of Level B and Level A harassment, mortality for Kogia species in SOCAL of the HSTT study area and number indicating the instances of total take as a percentage of stock abundance.

		Instances of indicated types of incidental take (not all takes represent separate individuals, especially for disturbance)									
		Level B Harassment		Level A Harassment			Total Takes	Abundance		Instance of total take as percent of abundance	
Species	Stock	Behavioral Disturbance	TTS (may also include Disturbance)	PTS	Tissue Damage	Mortality	TOTAL TAKES (entire Study Area)	NAVY abundance in Action Area SOCAL [1]	NMFS SARS Abundance [2]	Total take as percentage of total Navy abundance in Action Area	Total take as percentage of total SAR abundance
Kogia whales	CA/OR/WA	2779	6353	38	0	0	9170	757	4111	1211	223

Note: For the SOCAL take estimates, because of the manner in which the Navy action area overlaps the ranges of many MMPA stocks (i.e., a stock may range far north to Washington state and beyond and abundance may only be predicted within the U.S. EEZ, while the Navy action area is limited to Southern California and northern Mexico, but extends beyond the U.S. EEZ), we compare predicted takes to both the abundance estimates for the action area, as well as the SARs.

stock of *Kogia*, specifically when compared against the Navy's action area abundance. Based on the percentages above, most individuals are taken in an average of 3 days in a year, while some Kogia individuals that might remain in the SOCAL action area may be taken an average of 12 days in a year. These averages allow that perhaps a smaller subset is taken with a slightly higher average and larger variability of highs and lows, but still with no reason to think that any individuals would be taken every day for weeks or months out of the year, much less on sequential days. The majority of these behavioral takes are expected to be of a milder intensity (compared to those that occur at higher levels) and nor are they likely to occur over sequential days, which suggests that the overall scale of impacts for any individual would be relatively low and unlikely to result in fitness effects that would impact reproductive success or survival.

The quantitative analysis predicts small numbers of PTS per year from sonar and other transducers (during training and testing activities). However, *Kogia* whales would likely avoid sound levels that could cause higher levels of TTS (greater than 20 dB) or PTS. TTS and PTS thresholds for high-frequency cetaceans, including *Kogia* whales, are lower than for all other marine mammals, which leads to a higher number of estimated impacts relative to the number of animals exposed to the sound as compared to other hearing groups (*e.g.*, mid-frequency cetaceans).

Impacts to dwarf and pygmy sperm whale stocks (small and resident populations BIAs) will be reduced through the Hawaii Island Mitigation Area that limits the use of mid-frequency active anti-submarine warfare sensor bins MF1 and MF4 and where the Navy will not use explosives during testing and training (*e.g.*, surface-to-surface or air-to-surface missile and gunnery events, BOMBEX, and mine neutralization).

In summary and as described above, the following factors primarily support our preliminary determination that the impacts resulting from Navy's activities are not expected to adversely affect *Kogia spp.* through effects on annual rates of recruitment or survival.

- No serious injuries or mortalities are proposed for authorization or anticipated to occur for *Kogia spp.*
- While the majority of takes are caused by exposure during ASW activities, the impacts from these exposures are not expected to have either significant or long-term effects because (and as discussed above):
  - ASW activities typically involve fast-moving assets (relative to marine mammal swim speeds) and individuals are not expected to be exposed either for long periods within a day or over many sequential days.
  - As discussed, the majority of the harassment takes result from hull-mounted sonar during MTEs. When distance cutoffs are applied for odontocetes, this means that all of the takes from hull-mounted sonar (MF1) result from above exposure 154 dB. However, the majority (*e.g.*, 85 percent) of the takes results from exposures below 166 dB. The majority of the takes have a relatively lower likelihood in have severe impacts.
- As described in more detail above (Tables 73 and 74), the scale of the effects are such that pygmy and dwarf sperm whale are taken an average of 2–3 days per year, while some subset of individuals that might remain in the SOCAL action area for extended periods could be taken on an average of 12 days per year (based on the percentages above, respectively, but with some taken more or less). As described above, given this number of takes spread across a year and the nature of the Navy's activities, these takes are not expected to typically occur over sequential days.
- Impacts to these small and resident populations of dwarf and pygmy sperm whale stocks will be reduced through the implementation of the requirements in the Hawaii Island Mitigation Area.
- *Kogia spp.* are not depleted under the MMPA, nor are they listed under the ESA.
- The HSTT activities are not expected to occur in an area/time of specific importance for reproductive, feeding, or other known critical behaviors for *Kogia spp.* and there is no designated critical habitat in the HSTT Study Area.

Consequently, the HSTT activities are not expected to adversely impact rates of recruitment or survival of any of the analyzed stocks of *Kogia* whales (Table 73 above in this section).

Beaked Whales

In Tables 75 and 76 below, for beaked whales, we indicate the total annual mortality, Level A and Level B harassment, and a number indicating the instances of total take as a percentage of abundance. No Level A harassment (PTS and Tissue Damage) takes are anticipated.

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Table 75. Annual takes of Level B and Level A harassment, mortality for beaked whales in the HSTT study area and number indicating the instances of total take as a percentage of stock abundance.

	Instances of indicated types of incidental take (not all takes represent separate individuals, especially for disturbance)										
	Level B Harassment		Level A Harassment		Mortality	Total Takes		Abundance		Instance of total take as percent of abundance	
Species Stock Navy EEZ location (HRC)	Behavioral Disturbance	TTS (may also include disturbance)	PTS	Tissue Damage		TOTAL TAKES (entire Study Area)	Takes (within NAVY EEZ)	Total Navy Abundance in and out EEZ (HRC)	Within Navy EEZ Abundance HRC	Total take as percentage of total Navy abundance (HRC)	EEZ take as percentage of EEZ abundance (HRC)
Blainville's beaked whale Hawaiian (HRC)	5369	17	0	0	0	5386	4140	989	768	545	539
Cuvier's beaked whale Hawaiian (HRC)	1792	4	0	0	0	1796	1377	345	268	521	514
Longman's beaked whale Hawaiian (HRC)	19152	81	0	0	0	19233	14585	3568	2770	539	527

Note: For the BI take estimates, we compare predicted takes to abundance estimates generated from the same underlying density estimates, both in and outside of the U.S. EEZ. Because the portion of the Navy's action area inside the U.S. EEZ is generally concomitant with the study area used to generate the abundance estimates in the SARs, and the abundance predicted by the same underlying density estimates is the preferred abundance to use, there is no need to separately compare the take to the SARs abundance estimate.

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Nearly all takes annually for beaked whales from Level B harassment are behavioral, less than 1 percent are TTS (Tables 75 and 76 above), No PTS, injury, serious injury, or mortalities are anticipated. No beaked whales are listed under the ESA.

Most Level B harassments to beaked whales from hull-mounted sonar (MFA) in the HSTT Study Area would result from received levels between 154 and 160 dB SPL (94 percent). Therefore, the majority of Level B takes are expected to be in the form of milder responses (*i.e.*, lower-level exposures that still rise to the level of take, but would likely be less severe in the range of responses that qualify as take). As mentioned earlier in this section, we anticipate more severe effects from takes when animals are exposed to higher received levels.

For the total instances of all of the different types of takes, the numbers

Table 76. Annual takes of Level B and Level A harassment, mortality for beaked whales in SOCAL in the HSTT study area and number indicating the instances of total take as a percentage of stock abundance.

		Instances of indicated types of incidental take (not all takes represent separate individuals, especially for disturbance)									
		Level B Harassment		Level A Harassment			Total Takes	Abundance		Instance of total take as percent of abundance	
Species	Stock	Behavioral Disturbance	TTS (may also include disturbance)	PTS	Tissue Damage	Mortality	TOTAL TAKES (entire Study Area)	NAVY abundance in Action Area SOCAL [1]	NMFS SARS Abundance [2]	Total take as percentage of total Navy abundance	Total take as percentage of total SAR abundance
Baird's beaked whale	CA/OR/WA	2030	14	0	0	0	2044	74	2697	2762	76
Cuvier's beaked whale	CA/OR/WA	11347	79	0	0	0	11426	520	3274	2197	349
Mesoplodon spp.	CA/OR/WA	6109	43	0	0	0	6152	89	3044	6912	202

Note: For the SOCAL take estimates, because of the manner in which the Navy action area overlaps the ranges of many MMPA stocks (*i.e.*, a stock may range far north to Washington state and beyond and abundance may only be predicted within the U.S. EEZ, while the Navy action area is limited to Southern California and northern Mexico, but extends beyond the U.S. EEZ), we compare predicted takes to both the abundance estimates for the action area, as well as the SARs.

indicating the instances of total take as a percentage of abundance range from 514 to 545 for Blainville's beaked whale, Cuvier's beaked whale, and Longman's beaked whale (all Hawaiian stocks), with no notable difference in and outside of the U.S. EEZ (Table 75). For beaked whales off of SOCAL, the instances of total take as a percentage of abundance are between 76 and 349 as compared to the total abundance of these far-ranging stocks. However, the percentages are 2762, 2197, and 6912 for Baird's beaked whale, Cuvier's beaked whale, and Mesoplodon *spp.*, respectively, when compared to the abundance within the Navy's action area, which is based on static density estimates (Table 76). This means that generally, beaked whales might be expected to be taken on an average of 1–6 days per year, while some individuals that might remain in the Navy SOCAL action area for extended periods of time could be taken on more, but not likely as high as 22–28 days per year, or potentially more, though not likely as high as 69 days per year, for Mesoplodon *spp.* While the likelihood and extent of repeated takes for some subset of Mesoplodon individuals is comparatively high when using the Navy's abundance, this is likely a result of the fact that the acoustic modeling process does not account for horizontal animal movement and thus and migration of beaked whales in and out the Study Area. The Navy's abundance indicates a population of approximately 89 Mesoplodon individuals in Southern California. However, it is unlikely that it is the same 89 individuals that are present all year long. Even for those beaked whales which show high site fidelity, tagging data indicates that they can travel tens of km to up to 100 km from an initial tagging or sighting location (*e.g.*, Schorr *et al.*, 2009, Sweeney *et al.*, 2007, etc.). Therefore, additional individuals up to a 100 km or more from the study area may also at some time move into the study area and be available to be exposed to Navy activities. As a result, the potential for repeated exposures of Mesoplodon likely falls somewhere in between the numbers estimated using the SAR abundance and the Navy's abundance. Also, we'd note that NMFS's 2017 draft SAR (Caretta *et al.*, 2017) indicates a slight increasing population trend for this stock when 2014 survey data are considered, lessening the likelihood of adverse impacts on rates of recruitment or survival, if some small number of individuals incur fitness impacts. Given the numbers of days within the year that they are expected to be taken, some subset of SOCAL Mesoplodon beaked whale individuals will likely occasionally be taken across sequential days. However, given the milder comparative nature of the majority of the anticipated exposures (*i.e.*, the received level and the fact that most individual exposures would be expected not to be of a long duration due to the nature of the operations and the moving animals), combined with the fact that there are ample alternative nearby feeding opportunities available for odontocetes should disturbances interrupt feeding bouts, and the evidence that beaked whales often leave and area during training exercises but return a few days later (Claridge and Durban, 2009; Moretti *et al.*, 2009, 2010; Tyack *et al.*, 2010, 2011; McCarthy *et al.*, 2011), impacts to individual fitness that could affect survivorship or reproductive success are not anticipated.

Beaked whales have been shown to be particularly sensitive to sound and therefore have been assigned a lower harassment threshold, *i.e.*, a more distant distance cutoff (50 km for high source level, 25 km for moderate source level). This means that many of the authorized takes are expected to result from lower-level exposures. But we also note the growing literature to support the fact that marine mammals differentiate sources of the same level emanating from different distances, and exposures from more distant sources are likely comparatively less impactful.

Behavioral responses can range from a mild orienting response, or a shifting of attention, to flight and panic (Richardson, 1995; Nowacek, 2007; Southall *et al.*, 2007; Finneran and Jenkins, 2012). Research has also shown that beaked whales are especially sensitive to the presence of human activity (Tyack *et al.*, 2011; Pirotta *et al.*, 2012). Beaked whales have been documented to exhibit avoidance of human activity or respond to vessel presence (Pirotta *et al.*, 2012). Beaked whales were observed to react negatively to survey vessels or low altitude aircraft by quick diving and other avoidance maneuvers, and none were observed to approach vessels (Wursig *et al.*, 1998). Some beaked whale vocalizations may overlap with the MFAS/HFAS TTS frequency range (2–20 kHz). However, as noted above, NMFS does not anticipate TTS of a serious degree or extended duration to occur as a result of exposure to MFAS/HFAS.

It has been speculated for some time that beaked whales might have unusual sensitivities to sonar sound due to their likelihood of stranding in conjunction with MFAS use. Research and observations show that if beaked whales are exposed to sonar or other active acoustic sources they may startle, break off feeding dives, and avoid the area of the sound source to levels of 157 dB re 1 µPa, or below (McCarthy *et al.*, 2011). Acoustic monitoring during actual sonar exercises revealed some beaked whales continuing to forage at levels up to 157 dB re 1 µPa (Tyack *et al.* 2011). Stimpert *et al.* (2014) tagged a Baird's beaked whale, which was subsequently exposed to simulated MFAS. Changes in the animal's dive behavior and locomotion were observed when received level reached 127 dB re 1µPa. However, Manzano-Roth *et al.* (2013) found that for beaked whale dives that continued to occur during MFAS activity, differences from normal dive profiles and click rates were not detected with estimated received levels up to 137 dB re 1 µPa while the animals were at depth during their dives. And in research done at the Navy's fixed tracking range in the Bahamas, animals were observed to leave the immediate area of the anti-submarine warfare training exercise (avoiding the sonar acoustic footprint at a distance where the received level was "around 140 dB" SPL, according to Tyack *et al.* (2011)) but return within a few days after the event ended (Claridge and Durban, 2009; Moretti *et al.*, 2009, 2010; Tyack *et al.*, 2010, 2011; McCarthy *et al.*, 2011). Tyack *et al.* (2011) report that, in reaction to sonar playbacks, most beaked whales stopped echolocating, made long slow ascent to the surface, and moved away from the sound. A similar behavioral response study conducted in Southern California waters during the 2010–2011 field season found that Cuvier's beaked whales exposed to MFAS displayed behavior ranging from initial orientation changes to avoidance responses characterized by energetic fluking and swimming away from the source (DeRuiter *et al.*, 2013b). However, the authors did not detect similar responses to incidental exposure to distant naval sonar exercises at comparable received levels, indicating that context of the exposures (*e.g.*, source proximity, controlled source ramp-up) may have been a significant factor. The study itself found the results inconclusive and meriting further investigation. Cuvier's beaked whale responses suggested particular sensitivity to sound exposure as consistent with results for Blainville's beaked whale.

Populations of beaked whales and other odontocetes on the Bahamas and other Navy fixed ranges that have been

operating for decades, appear to be stable. Behavioral reactions (avoidance of the area of Navy activity) seem likely in most cases if beaked whales are exposed to anti-submarine sonar within a few tens of kilometers, especially for prolonged periods (a few hours or more) since this is one of the most sensitive marine mammal groups to anthropogenic sound of any species or group studied to date and research indicates beaked whales will leave an area where anthropogenic sound is present (Tyack *et al.*, 2011; De Ruiter *et al.*, 2013; Manzano-Roth *et al.*, 2013; Moretti *et al.*, 2014). Research involving tagged Cuvier's beaked whales in the SOCAL Range Complex reported on by Falcone and Schorr (2012, 2014) indicates year-round prolonged use of the Navy's training and testing area by these beaked whales and has documented movements in excess of hundreds of kilometers by some of those animals. Given that some of these animals may routinely move hundreds of kilometers as part of their normal pattern, leaving an area where sonar or other anthropogenic sound is present may have little, if any, cost to such an animal. Photo identification studies in the SOCAL Range Complex, a Navy range that is utilized for training and testing, have identified approximately 100 individual Cuvier's beaked whale individuals with 40 percent having been seen in one or more prior years, with re-sightings up to seven years apart (Falcone and Schorr, 2014). These results indicate long-term residency by individuals in an intensively used Navy training and testing area, which may also suggest a lack of long-term consequences as a result of exposure to Navy training and testing activities. Finally, results from passive acoustic monitoring estimated regional Cuvier's beaked whale densities were higher than indicated by the NMFS's broad scale visual surveys for the U.S. west coast (Hildebrand and McDonald, 2009).

Based on the findings above, it is clear that the Navy's long-term ongoing use of sonar and other active acoustic sources has not precluded beaked whales from also continuing to inhabit those areas. Based on the best available science, the Navy and NMFS believe that beaked whales that exhibit a significant TTS or behavioral reaction due to sonar and other active acoustic training or testing activities would generally not have long-term consequences for individuals or populations.

NMFS does not expect strandings, serious injury, or mortality of beaked whales to occur as a result of training activities. Stranding events coincident with Navy MFAS use in which exposure to sonar is believed to have been a contributing factor were detailed in the Stranding and Mortality section of this proposed rule. However, for some of these stranding events, a causal relationship between sonar exposure and the stranding could not be clearly established (Cox *et al.*, 2006). In other instances, sonar was considered only one of several factors that, in their aggregate, may have contributed to the stranding event (Freitas, 2004; Cox *et al.*, 2006). Because of the association between tactical MFAS use and a small number of marine mammal strandings, the Navy and NMFS have been considering and addressing the potential for strandings in association with Navy activities for years. In addition to the proposed mitigation measures intended to more broadly minimize impacts to marine mammals, the reporting requirements set forth in this rule ensure that NMFS is notified if a stranded marine mammal is found (see General Notification of Injured or Dead Marine Mammals in the regulatory text below). Additionally, through the MMPA process (which allows for adaptive management), NMFS and the Navy will determine the appropriate way to proceed in the event that a causal relationship were to be found between Navy activities and a future stranding.

Biologically important areas for small and resident populations of Cuvier's and Blainville's beaked whales will be protected by the Hawaii Island Mitigation Area that limits the use of mid-frequency active anti-submarine warfare sensor bins MF1 and MF4 and where the Navy will not use explosives during testing and training (*e.g.*, surface-to-surface or air-to-surface missile and gunnery events, BOMBEX, and mine neutralization).

In summary and as described above, the following factors primarily support our preliminary determination that the impacts resulting from the Navy's activities are not expected to adversely affect beaked whales taken through effects on annual rates of recruitment or survival.

- No mortalities of beaked whales are proposed for authorization or anticipated to occur.
- No PTS or injury of beaked whales from acoustic or explosives stressors are proposed for authorization or anticipated to occur.
- While the majority of takes are caused by exposure during ASW activities the impacts from these exposures are not expected to have either significant or long-term effects because (and as discussed above):
  - ASW activities typically involve fast-moving assets (relative to marine mammals swim speeds) and individuals are not expected to be exposed either for long periods within a day or over many sequential days.
  - As discussed, the majority of the harassment takes result from hull-mounted sonar during MTEs. When distance cutoffs are applied for beaked whales, this means that all of the takes from hull-mounted sonar (MF1) result from above exposure 154 dB. However, the majority (*e.g.*, 94 percent) of the takes results from exposures below 160 dB. The majority of the takes have a relatively lower likelihood to have severe impacts.
- As described in more detail above (Tables 75 and 76), the scale of the effects are such that individuals in these stocks are likely taken in an average of 1–6 days per year, while a subset of beaked whale individuals that remain in the SOCAL action area for a substantial portion of the year could be taken in more, though not likely above 22–28 days per year, with Mesolplodon individuals potentially taken more, though not likely above 69 days per year. While the likelihood and extent of repeated takes for some subset of Mesoplodon individuals is comparatively high, we note that the population trend for this stock is increasing slightly, lessening the likelihood of adverse impacts on rates of recruitment or survival. While some of the individuals in SOCAL may occasionally be taken in sequential days, because of the nature of the exposures and the other factors discussed above, any impacts to individual fitness would be limited and with the potential to accrue to no more than a limited number of individuals and would not be expected to affect rates of recruitment or survival.
- Impacts to BIAs for small and resident populations of Cuvier's and Blainville's beaked whales will be reduced through implementation of requirements in the Hawaii Island Mitigation Area.

Consequently, the activities are not expected to adversely impact rates of recruitment or survival of any of the beaked whale stocks analyzed (Tables 75 and 76 above in this section).

Odontocetes (Small Whales and Dolphins)

In Tables 77 and 78 below, for odontocetes (in this section odontocetes refers specifically to the small whales and dolphins indicated in Tables 77 and 78), we indicate the total annual mortality, Level A and Level B harassment, and a number indicating

Table 77. Annual takes of Level B and Level A harassment, mortality for odontocetes in the HSTT study area and number indicating the instances of total take as a percentage of stock abundance.

	Instances of indicated types of incidental take (not all takes represent separate individuals, especially for disturbance)										
	Level B Harassment		Level A Harassment		Mortality	Total Takes		Abundance		Instance of total take as percent of abundance	
Species Stock Navy EEZ location (HRC)	Behavioral Disturbance	TTS (may also include disturbance)	PTS	Tissue Damage		TOTAL TAKES (entire Study Area)	Takes (within NAVY EEZ)	Total Navy Abundance in and out EEZ (HRC)	Within Navy EEZ Abundance HRC	Total take as percentage of total Navy abundance (HRC)	EEZ take as percentage of EEZ abundance (HRC)
Bottlenose dolphin Hawaiian Pelagic (HRC)	3196	133	0	0	0	3329	2481	1528	1442	218	172
Bottlenose dolphin Kauai & Niihau (HRC)	544	21	0	0	0	565	264	184	184	307	143
Bottlenose dolphin Oahu (HRC)	8600	62	1	0	0	8663	8376	741	741	1169	1130
Bottlenose dolphin 4-Island (HRC)	349	10	0	0	0	359	316	189	189	190	167
Bottlenose dolphin Hawaii (HRC)	74	5	0	0	0	79	42	131	131	60	32
False killer whale Hawaii Pelagic (HRC)	999	42	0	0	0	1041	766	645	507	161	151
False killer whale Main Hawaiian Islands Insular (HRC)	572	16	0	0	0	588	476	147	147	400	324

the instances of total take as a percentage of abundance. Overall, takes from Level A harassment (PTS and Tissue Damage) account for less than one percent of all total takes.

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False killer whale Northwestern Hawaiian Islands (HRC)	365	16	0	0	0	381	280	215	169	177	166
Fraser's dolphin Hawaiian (HRC)	39784	1289	2	0	0	41075	31120	5408	18762	760	166
Killer whale Hawaiian (HRC)	118	6	0	0	0	124	93	69	54	180	172
Melon-headed whale Hawaiian Islands (HRC)	3260	231	0	0	0	3491	2557	1782	1782	196	143
Melon-headed whale Kohala Resident (HRC)	341	10	0	0	0	351	182	447	447	79	41
Pantropical spotted dolphin Hawaii Island (HRC)	3767	227	0	0	0	3994	2576	2405	2405	166	107
Pantropical spotted dolphin Hawaii Pelagic (HRC)	9973	476	0	0	0	10449	7600	5462	4637	191	164
Pantropical spotted dolphin Oahu (HRC)	4284	45	0	0	0	4329	4194	372	372	1164	1127
Pantropical spotted dolphin 4-Island (HRC)	702	17	0	0	0	719	634	657	657	109	98
Pygmy killer whale Hawaiian	8122	401	0	0	0	8523	6538	4928	3931	173	166

(HRC)											
Pygmy killer whale Tropical (HRC)	710	50	0	0	0	760	490	159	23	478	2130
Risso's dolphin Hawaiian (HRC)	8950	448	0	0	0	9398	7318	1210	4159	777	174
Rough-toothed dolphin Hawaiian (HRC)	6112	373	0	0	0	6485	4859	3054	2808	212	173
Short-finned pilot whale Hawaiian (HRC)	12499	433	1	0	0	12933	9946	6433	5784	201	172
Spinner dolphin Hawaii Island (HRC)	279	12	0	0	0	291	89	629	629	46	14
Spinner dolphin Hawaii Pelagic (HRC)	4331	202	0	0	0	4533	3491	2885	2229	157	157
Spinner dolphin Kauai & Niihau (HRC)	1683	63	0	0	0	1746	812	604	604	289	144
Spinner dolphin Oahu & 4-Island (HRC)	1790	34	1	0	0	1825	1708	354	354	516	482
Striped dolphin Hawaiian (HRC)	7379	405	0	0	0	7784	6034	4779	3646	163	165

Note: For the HI take estimates, we compare predicted takes to abundance estimates generated from the same underlying density estimates, both in and outside of the U.S. EEZ. Because the portion of the Navy's action area inside the U.S. EEZ is generally concomitant with the study area used to generate the abundance estimates in the SARs, and the abundance predicted by the same underlying density estimates is the preferred abundance to use, there is no need to separately compare the take to the SARs abundance estimate.

Table 78. Annual takes of Level B and Level A harassment, mortality for odontocetes in SOCAL of the HSTT study area and number indicating the instances of total take as a percentage of stock abundance.

		Instances of indicated types of incidental take (not all takes represent separate individuals, especially for disturbance)									
		Level B Harassment		Level A Harassment			Total Takes	Abundance		Instance of total take as percent of abundance	
Species	Stock	Behavioral Disturbance	TTS (may also include disturbance)	PTS	Tissue Damage	Mortality	TOTAL TAKES (entire Study Area)	NAVY Abundance in Action Area SOCAL [1]	NMFS SARS Abundance [2]	Total take as percentage of total Navy abundance in Action Area	Total take as percentage of total SAR abundance
Bottlenose dolphin	California Coastal	1771	38	0	0	0	1809	238	515	760	351
Bottlenose dolphin	CA/OR/WA Offshore	51727	3695	3	0	0	55425	5946	1924	932	2881
Killer whale	Eastern North Pacific (ENP) Offshore	96	11	0	0	0	107	4	240	2675	45
Killer whale	ENP Transient/ West Coast Transient	179	20	0	0	0	199	30	243	663	82
Long-beaked common dolphin	California	233485	13787	18	2	0	247292	10258	101305	2411	244
Northern right whale dolphin	CA/OR/WA	90052	8047	10	1	0	98110	7705	26556	1273	369

Pacific white-sided dolphin	CA/OR/WA	69245	6093	5	0	0	75343	6626	26814	1137	281
Risso's dolphin	CA/OR/WA	116143	10118	9	0	0	126270	7784	6336	1622	1993
Short-beaked common dolphin	CA/OR/WA	1374048	118525	79	10	2	1492664	261438	969861	571	154
Short-finned pilot whale	CA/OR/WA	1789	124	1	0	0	1914	208	836	920	229
Striped dolphin	CA/OR/WA	163640	11614	3	0	0	175257	39862	29211	440	600

Note: For the SOCAL take estimates, because of the manner in which the Navy action area overlaps the ranges of many MMPA stocks (i.e., a stock may range far north to Washington state and beyond and abundance may only be predicted within the U.S. EEZ, while the Navy action area is limited to Southern California and northern Mexico, but extends beyond the U.S. EEZ), we compare predicted takes to both the abundance estimates for the action area, as well as the SARs.

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Nearly all takes annually for odontocetes are from Level B harassment either behavioral or TTS (less than 1 percent PTS) (Tables 77 and 78 above). No serious injuries or mortalities are anticipated. False killer whales (Main Hawaiian Islands Insular) are listed as endangered under the ESA and depleted under the MMPA. NMFS is currently engaged in an internal Section 7 consultation under the ESA and the outcome of that consultation will further inform our final decision.

Most Level B harassments to odontocetes from hull-mounted sonar (MF1) in the HSTT Study Area would result from received levels between 154 and 166 dB SPL (85 percent). Therefore, the majority of Level B takes are expected to be in the form of milder responses compared to higher level exposures). As mentioned earlier in this section, we anticipate more severe

effects from takes when animals are exposed to higher received levels.

For the total instances of all of the different types of takes, the numbers indicating the instances of total take for odontocetes addressed in this section as a percentage of abundance range from 14 to 1,169 for Hawaiian stocks (Table 77). For most odontocetes off SOCAL, the instances of total take as a percentage of abundance are between 45 and 1,273 (Table 78). However, the percentages are 2,675 and 2,411 for Killer whale and Long-beaked common dolphin, respectively, when compared to the abundance within the Navy action area, which is based on static density estimates (Table 78). The percentages are 1,993 and 1,622 for Risso's dolphin when compared to the total U.S. EEZ abundance (from the SARs) and to the abundance within the Navy action area, respectively, and 2,811 for Bottlenose dolphin (CA/OR/WA offshore stock) when compared to the total abundance. This means that generally, Hawaiian and SOCAL odontocetes stocks might be expected to be taken an average of 2–13 days per year, while some of a subset of individuals of four stocks (Offshore bottlenose dolphins, killer whales, long-beaked common dolphin, and Risso's dolphin) that might remain in the Navy SOCAL action area for extended periods of time could be taken on more, 17 to 27 days per year. It is notable that for the offshore stock of bottlenose dolphins and for Risso's dolphins, the SAR abundances are actually less than the Navy action area abundances, likely because these are more offshore species and the navy abundance captures the abundance generated outside the U.S. EEZ from the Navy action are density estimates, and therefore the percentages are higher—but either way these stock comparisons fall within the general bounds discussed above. We further note that long-beaked common dolphin, which have a high percentage generated from a high number of takes and a high abundance, have an increasing population trend (Caretta *et al.*, 2017), further lessening the likelihood of adverse impacts to rates of recruitment or survival. The majority of the takes are not from higher level exposures from which more severe responses would be expected. Given the numbers of days within the year that they are expected to be taken, some subset of individuals will likely occasionally be taken across sequential days, however, given the milder to moderate nature of the majority of the anticipated exposures (*i.e.*, the received level and the fact that most individual exposures would be expected not to be of a long duration due to the nature of the operations and the moving animals), combined with the fact that there are ample alternative nearby feeding opportunities available for odontocetes should disturbances interrupt feeding bouts, impacts to individual fitness that could affect survivorship or reproductive success are not anticipated.

Research and observations show that if delphinids are exposed to sonar or other active acoustic sources they may react in a number of ways depending on their experience with the sound source and what activity they are engaged in at the time of the acoustic exposure. Delphinids may not react at all until the sound source is approaching within a few hundred meters to within a few kilometers depending on the environmental conditions and species. Delphinids that are exposed to activities that involve the use of sonar and other active acoustic sources may alert, ignore the stimulus, change their behaviors or vocalizations, avoid the sound source by swimming away or diving, or be attracted to the sound source (Richardson, 1995; Nowacek, 2007; Southall *et al.*, 2007; Finneran and Jenkins, 2012).

Many of the recorded delphinid vocalizations overlap with the MFAS/HFAS TTS frequency range (2–20 kHz); however, as noted above, NMFS does not anticipate TTS of a serious degree or extended duration to occur as a result of exposure to MFAS/HFAS.

Identified important areas for odontocetes will be protected by the Navy's mitigation areas. The size of the 4-Islands Region Mitigation Area would expand to include an area north of Maui and Molokai and overlaps an area identified as a BIA for the endangered Main Hawaiian Islands insular false killer whales (Baird *et al.*, 2015; Van Parijs, 2015) (see Figure 5.4–3, in Chapter 5 Mitigation Areas for Marine Mammals in the Hawaii Range Complex of the HSTT DEIS/OEIS). The 4-Islands Region Mitigation Area provides partial protection for identified biologically important area for dolphin species (small and resident populations) including common bottlenose dolphin, pantropical spotted dolphin, and spinner dolphin by not using mid-frequency active anti-submarine warfare sensor MF1. The Navy's Hawaii Island Mitigation Area also provides additional protection for identified biologically important areas (small and resident populations) for Main Hawaiian Islands insular false killer whales, pygmy killer whale, melon-headed whale, short-finned pilot whale, and dolphin species (common bottlenose dolphin, pantropical spotted dolphin, spinner dolphin, rough-toothed dolphins) by limiting the use of mid-frequency active anti-submarine warfare sensor bins MF1 and MF4 and not using explosives during testing and training (*e.g.*, surface-to-surface or air-to-surface missile and gunnery events, BOMBEX, and mine neutralization).

In summary and as described above, the following factors primarily support our preliminary determination that the impacts resulting from Navy's activities are not expected to adversely affect dolphins and small whales taken through effects on annual rates of recruitment or survival.

- As described in the "Serious Injury or Mortality" section (Table 68), 1.2 mortalities annually over five years is proposed for authorization for short-beaked common dolphin (CA/OR/WA stock). The proposed mortality for short-beaked common dolphin (CA/OR/WA stock) falls below the insignificance threshold and, therefore, we consider the addition an insignificant incremental increase to human-caused mortality.
- There are no PTS or injury from acoustic or explosive sources proposed for authorization or anticipated to occur for most odontocetes. As described above, any PTS that may occur is expected to be of a relatively smaller degree because of the unlikelihood that animals would be close enough for a long enough amount of time to incur more severe PTS (for sonar) and the anticipated effectiveness of mitigation in preventing very close exposures for explosives.
- Large threshold shifts are not anticipated for these activities because of the unlikelihood that animals will remain within the ensonified area (due to the short duration of the majority of exercises, the speed of the vessels (relative to marine mammals swim speeds), and the short distance within which the animal would need to approach the sound source) at high levels for the duration necessary to induce larger threshold shifts.
- While the majority of takes are caused by exposure during ASW activities, the impacts from these exposures are not expected to have either significant or long-term effects because (and as discussed above):
  - ASW activities typically involve fast-moving assets (relative to marine mammal swim speeds) and individuals are not expected to be exposed either for long periods within a day or over many sequential days.
  - As discussed, the majority of the harassment takes result from hull-mounted sonar during MTEs. When

distance cutoffs are applied for odontocetes, this means that all of the takes from hull-mounted sonar (MF1) result from above exposure 154 dB. However, the majority (*e.g.*, 85 percent) of the takes results from exposures below 166 dB. The majority of the takes are not from higher level exposures from which more severe responses would be expected.

- As described in more detail above (Tables 77 and 78) for the stocks addressed in this section, the scale of the effects are such that individuals of most Hawaiian and SOCAL odontocete stocks are likely taken an average of 2–13 days per year, while killer whale, long-beaked common dolphin, and Risso's dolphin individuals that remain in the SOCAL action area could be taken an average of 17–27 days per year. Bottlenose dolphin (CA/OR/WA offshore stock) could be taken an average of 10–29 days per year. While some of the individuals in SOCAL may occasionally be taken in sequential days, because of the nature of the exposures and the other factors discussed above, any impacts to individual fitness would be limited and with the potential to accrue to no more than a limited number of individuals and would not be expected to affect rates of recruitment or survival. We further note that long-beaked common dolphin have an increasing population trend.
- The 4-Islands Region Mitigation Area provides partial protection for identified biologically important area for dolphin species (small and resident populations) by not using mid-frequency active anti-submarine warfare sensor MF1.
- The Navy's Hawaii Island Mitigation Area also provides additional protection for identified biologically important areas (small and resident populations) for endangered Main Hawaiian Islands insular false killer whales, pygmy killer whale, melon-headed whale, short-finned pilot whale, and dolphin species by limiting the use of mid-frequency MF1 and MF4 and not using explosives during testing and training.
- All odontocetes in the HSTT Study Area with the exception of endangered Main Hawaiian Islands Insular false killer whale are not depleted under the MMPA, nor are they listed under the ESA.

Consequently, the activities are not expected to adversely impact rates of recruitment or survival of any of the stocks of analyzed odontocete species (Table 74, above in this section).

Porpoise

In Table 79 below, for Dall's porpoise, we indicate the total annual mortality, Level A and Level B harassment, and a number indicating the instances of total take as a percentage of abundance. Overall, takes from Level A harassment (PTS and Tissue Damage) account for less than one percent of all total takes.

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Nearly all takes annually for Dall's porpoises are from Level B harassment other behavioral or TTS. Less than 1 percent of all takes are Level A harassment (PTS) (table 79 above). No injury (tissue damage) serious injury or mortalities are anticipated. Dall's porpoise are not listed under the ESA.

Most Level B harassments to Dall's porpoise from hull-mounted sonar (MF1) in the HSTT Study Area would result from received levels between 154 and 166 dB SPL (85 per cent). Therefore, the majority of Level B takes are expected to be in the form of milder responses compared to higher level exposures. As mentioned earlier in this section, we anticipate more severe effects from takes when animals are exposed to higher received levels.

Table 79: Annual takes of Level B and Level A harassment, mortality for porpoises in SOCAL in the HSTT study area and number indicating the instances of total take as a percentage of stock abundance.

		Instances of indicated types of incidental take (not all takes represent separate individuals, especially for disturbance)									
		Level B Harassment		Level A Harassment			Total Takes	Abundance		Instance of total take as percent of abundance	
Species	Stock	Behavioral Disturbance	TTS (may also include disturbance)	PTS	Tissue Damage	Mortality	TOTAL TAKES (entire Study Area)	NAVY abundance in Action Area SOCAL [1]	NMFS SARS Abundance [2]	Total take as percentage of total Navy abundance in Action Area	Total take as percentage of total SAR abundance
Dall's porpoise	CA/OR/WA	14482	29891	209	0	0	44582	2054	25750	2170	173

Note: For the SOCAL take estimates, because of the manner in which the Navy action area overlaps the ranges of many MMPA stocks (i.e., a stock may range far north to Washington state and beyond and abundance may only be predicted within the U.S. EEZ, while the Navy action area is limited to Southern California and northern Mexico, but extends beyond the U.S. EEZ), we compare predicted takes to both the abundance estimates for the action area, as well as the SARs.

The majority of Level B takes are expected to be in the form of milder to moderate responses. As mentioned earlier in this section, we anticipate more severe effects from takes when animals are exposed to higher received levels.

For the total instances of all of the different types of takes, the numbers indicating the instances of total take for Dall's porpoise as a percentage of abundance is 173 when compared to the total abundance and 2,170 when compared to the abundance within the Navy action area, which is based on static density estimates (Table 79). This means that generally, Dall's porpoise might be expected to be taken on an average of 2 days per year, while some subset of individuals that might remain in the Navy SOCAL action area for extended periods of time could be taken on more like an average of 22 days per year. Occasional mild to moderate behavioral reactions are unlikely to cause long-term consequences for individual animals or populations, and because of the overall number of likely days taken and the nature of the operations, exposures are generally not expected to occur on many sequential days. Impacts to individual fitness that could affect survivorship or reproductive success are not anticipated.

Animals that experience hearing loss (TTS or PTS) may have reduced ability to detect relevant sounds such as predators, prey, or social vocalizations. Some porpoise vocalizations might overlap with the MFAS/HFAS TTS frequency range (2–20 kHz). Recovery from a threshold shift (TTS; partial hearing loss) can take a few minutes to a few days, depending on the exposure duration, sound exposure level, and the magnitude of the initial shift, with larger threshold shifts and longer exposure durations requiring longer recovery times (Finneran *et al.*, 2005; Mooney *et al.*, 2009a; Mooney *et al.*, 2009b; Finneran and Schlundt, 2010). More severe shifts may not fully recover and thus would be considered PTS. TTS and PTS thresholds for high-frequency cetaceans, including Dall's porpoises, are lower than for all other marine mammals, which leads to a higher number of estimated impacts relative to the number of animals exposed to the sound as compared to other hearing groups (*e.g.*, mid-frequency cetaceans). Dall's porpoises that do experience hearing loss (*i.e.*, TTS or PTS) from sonar sounds may have a reduced ability to detect biologically important sounds until their hearing recovers, but recovery time is not expected to be long for any small amount of TTS incurred from these activities, as described above. TTS would be recoverable and PTS would leave some residual hearing loss. During the period that a Dall's porpoise had hearing loss, biologically important sounds could be more difficult to detect or interpret. Odontocetes, including Dall's porpoises, use echolocation clicks to find and capture prey. These echolocation clicks are at frequencies above 100 kilohertz in Dall's porpoises. Therefore, echolocation is unlikely to be affected by a threshold shift at lower frequencies and should not affect a Dall's porpoise ability to locate prey or rate of feeding. The information available on harbor porpoise behavioral reactions to human disturbance (a closely related species) suggests that these species may be more sensitive and avoid human activity, and sound sources, to a longer range than most other odontocetes. This would make Dall's porpoises less susceptible to hearing loss; therefore, it is likely that the quantitative analysis over-predicted hearing loss impacts (*i.e.*, TTS and PTS) in Dall's porpoises.

Harbor porpoises (similar to Dall's porpoise) have been observed to be especially sensitive to human activity (Tyack *et al.*, 2011; Pirotta *et al.*, 2012). The information currently available regarding harbor porpoises suggests a very low threshold level of response for both captive (Kastelein *et al.*, 2000; Kastelein *et al.*, 2005) and wild (Johnston, 2002) animals. Southall *et al.* (2007) concluded that harbor porpoises are likely sensitive to a wide range of anthropogenic sounds at low received levels (– 90 to 120 dB). Research and observations of harbor porpoises for other locations show that this species is wary of human activity and will display profound avoidance behavior for anthropogenic sound sources in many situations at levels down to 120 dB re 1 µPa (Southall, 2007). Harbor porpoises routinely avoid and swim away from large motorized vessels (Barlow *et al.*, 1988; Evans *et al.*, 1994; Palka and Hammond, 2001; Polacheck and Thorpe, 1990). Harbor porpoises may startle and temporarily leave the immediate area of the training or testing until after the event ends.

ASW training activities using hull mounted sonar proposed for the HSTT Study Area generally last for only a few hours. Some ASW exercises can generally last for 2–10 days, or as much as 21 days for an MTE-Large Integrated ASW (see Table 4). For these multi-day exercises there will be extended intervals of non-activity in between active sonar periods. In addition, the Navy does not generally conduct ASW activities in the same locations. Given the average length of ASW events (times of continuous sonar use) and typical vessel speed, combined with the fact that the majority of porpoises in the HSTT Study Area would not likely remain in an area for successive days, it is unlikely that an animal would be exposed to active sonar at levels likely to result in a substantive response (*e.g.*, interruption of feeding) that would then be carried on for more than one day or on successive days.

In summary and as described above, the following factors primarily support our preliminary determination that the impacts resulting from Navy's activities are not expected to adversely affect Dall's porpoise taken through effects on annual rates of recruitment or survival.

- As described above, any PTS that may occur is expected to be of a relatively smaller degree because of the unlikelihood that animals would be close enough for a long enough amount of time to incur more severe PTS (for sonar) and the anticipated effectiveness of mitigation in preventing very close exposures for explosives.
- Large threshold shifts are not anticipated for these activities because of the unlikelihood that animals will remain within the ensonified area (due to the short duration of the majority of exercises, the speed of the vessels (relative to marine mammals swim speeds), and the short distance within which the animal would need to approach the sound source) at high levels for the duration necessary to induce larger threshold shifts.
- While the majority of takes are caused by exposure during ASW activities, the impacts from these exposures are not expected to have either significant or long-term effects because (and as discussed above):
  - ASW activities typically involve fast-moving assets (relative to marine mammal swim speeds) and individuals are not expected to be exposed either for long periods within a day or over many sequential days. As discussed, the majority of the harassment takes result from hull-mounted sonar during MTEs. When distance cutoffs are applied for odontocetes, this means that all of the takes from hull-mounted sonar (MF1) result from above exposure 154 dB. However, the majority (*e.g.*, 85 percent) of the takes results from exposures below 166 dB. The majority of the takes are not from higher level exposures from which more severe responses would be expected.
- As described in detail above (Table 79), the scale of the effects are such that individuals of Dall's porpoise might be expected to be taken on an average of 2 days per year, while some subset of

individuals that might remain in the Navy SOCAL action area for extended periods of time could be taken on more like an average of 22 days per year. Because of the nature of the exposures and the other factors discussed above, any impacts to individual fitness would be limited and with the potential to accrue to no more than a limited number of individuals and would not be expected to affect rates of recruitment or survival.

- Dall's porpoise in the HSTT Study Area are not depleted under the MMPA, nor are they listed under the ESA.

Consequently, the activities are not expected to adversely impact rates of recruitment or survival of any of the Dall's porpoise stock (CA/OR/WA).

Pinnipeds

In Tables 80 and 81 below, for pinnipeds, we indicate the total annual mortality, Level A and Level B harassment, and a number indicating the instances of total take as a percentage of abundance. Overall, takes from Level A harassment (PTS and Tissue Damage) account for less than one percent of all total takes.

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Table 80. Annual takes of Level B and Level A harassment, mortality for pinnipeds in the HRC in the HSTT study area and number indicating the instances of total take as a percentage of stock abundance.

	Instances of indicated types of incidental take (not all takes represent separate individuals, especially for disturbance)										
	Level B Harassment		Level A Harassment		Mortality	Total Takes		Abundance		Instance of total take as percent of abundance	
Species Stock Navy EEZ location (HRC)	Behavioral Disturbance	TTS (may also include disturbance)	PTS	Tissue Damage		TOTAL TAKES (entire Study Area)	Takes (within NAVY EEZ)	Total Navy Abundance in and out EEZ (HRC)	Within Navy EEZ Abundance HRC	Total take as percentage of total Navy abundance (HRC)	EEZ take as percentage of EEZ abundance (HRC)
Hawaiian monk seal Hawaiian (HRC)	143	62	1	0	0	206	195	169	169	122	115

Note: For the HI take estimates, we compare predicted takes to abundance estimates generated from the same underlying density estimates, both in and outside of the U.S. EEZ. Because the portion of the Navy's action area inside the U.S. EEZ is generally concomitant with the study area used to generate the abundance estimates in the SARs, and the abundance predicted by the same underlying density estimates is the preferred abundance to use, there is no need to separately compare the take to the SARs abundance estimate.

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Nearly all takes annually for pinnipeds are from Level B harassment either behavioral or TTS (less than 1 percent PTS) (Tables 80 and 81 above). No injury, serious injury, or mortalities are anticipated. Hawaiian monk seal and Guadalupe fur seal are listed as endangered under the ESA and depleted under the MMPA. NMFS is currently engaged in an internal Section 7 consultation under the ESA and the outcome of that consultation will further inform our final decision. The UME for Guadalupe fur seal is ongoing. Separately, the UME for California sea lions, not an ESA-listed species, will be closed soon.

Table 81. Annual takes of Level B and Level A harassment, mortality for pinnipeds for SOCAL in the HSTT study area and number indicating the instances of total take as a percentage of stock abundance.

		Instances of indicated types of incidental take (not all takes represent separate individuals, especially for disturbance)									
		Level B Harassment		Level A Harassment			Total Takes	Abundance		Instance of total take as percent of abundance	
Species	Stock	Behavioral Disturbance	TTS (may also include disturbance)	PTS	Tissue Damage	Mortality	TOTAL TAKES (entire Study Area)	NAVY abundance in Action Area SOCAL [1]	NMFS SARS Abundance [2]	Total take as percentage of total Navy abundance in Action Area	Total take as percentage of total SAR abundance
California sea lion	U.S.	113419	4789	87	9	1	118305	4085	296750	2896	40
Guadalupe fur seal	Mexico	1442	15	0	0	0	1457	1171	20000	124	7
Northern fur seal	California	15167	124	1	0	0	15292	886	14050	1726	109
Harbor seal	California	2450	2994	8	0	0	5452	321	30968	1698	18
Northern elephant seal	California	42916	17955	97	2	0	60970	4108	179000	1484	34

Note: For the SOCAL take estimates, because of the manner in which the Navy action area overlaps the ranges of many MMPA stocks (i.e., a stock may range far north to Washington state and beyond and abundance may only be predicted within the U.S. EEZ, while the Navy action area is limited to Southern California and northern Mexico, but extends beyond the U.S. EEZ), we compare predicted takes to both the abundance estimates for the action area, as well as the SARs.

Most Level B harassments to pinnipeds from hull-mounted sonar (MF1) in the HSTT Study Area would result from received levels between 160 and 172 dB SPL (83 percent). Therefore, the majority of Level B takes are expected to be in the form of milder to moderate responses. As mentioned earlier in this section, we anticipate more severe effects from takes when animals are exposed to higher received levels.

For the total instances of all of the different types of takes, the numbers indicating the instances of total take for pinnipeds as a percentage of abundance ranges from 7 to 124 when compared to the total abundance (Tables 80 and 81). However, for most pinnipeds off SOCAL, the instance of total take as a percentage of abundance are between 1,484 and 2,896 when compared to the abundance within the Navy action area, which is based on static density estimates (Table 81). This means that generally, pinnipeds might be expected to be taken on an average of less than 2 days per year. However, some subset of individuals of the California sea lion, Northern fur seal, and harbor seal stocks that might remain in the Navy SOCAL action area for extended periods of time could be taken on more like an average of 29, 18, and 17 days per year, respectively. The majority of the takes are not from higher level exposures from which more severe responses would be expected. Given the numbers of days within the year that they are expected to be taken, some subset of individuals, particularly California sea lions will likely occasionally be taken across sequential days, however, given the milder to moderate nature of the majority of the anticipated exposures (*i.e.*, the received level and the fact that most individual exposures would be expected not to be of a long duration due to the nature of the operations and the moving animals), impacts to individual fitness that could affect survivorship or reproductive success are not anticipated. We note that for California sea lions there is an increasing population trend.

Research and observations show that pinnipeds in the water may be tolerant of anthropogenic noise and activity (a review of behavioral reactions by pinnipeds to impulsive and non-impulsive noise can be found in Richardson *et al.*, 1995 and Southall *et al.*, 2007). Available data, though limited, suggest that exposures between approximately 90 and 140 dB SPL do not appear to induce strong behavioral responses in pinnipeds exposed to non-pulse sounds in water (Jacobs and Terhune, 2002; Costa *et al.*, 2003; Kastelein *et al.*, 2006c). Based on the limited data on pinnipeds in the water exposed to multiple pulses (small explosives, impact pile driving, and seismic sources), exposures in the approximately 150 to 180 dB SPL range generally have limited potential to induce avoidance behavior in pinnipeds (Harris *et al.*, 2001; Blackwell *et al.*, 2004; Miller *et al.*, 2004). If pinnipeds are exposed to sonar or other active acoustic sources they may react in a number of ways depending on their experience with the sound source and what activity they are engaged in at the time of the acoustic exposure. Pinnipeds may not react at all until the sound source is approaching within a few hundred meters and then may alert, ignore the stimulus, change their behaviors, or avoid the immediate area by swimming away or diving. Effects on pinnipeds in the HSTT Study Area that are taken by Level B harassment, on the basis of reports in the literature as well as Navy monitoring from past activities, will likely be limited to reactions such as increased swimming speeds, increased surfacing time, or decreased foraging (if such activity were occurring). Most likely, individuals will simply move away from the sound source and be temporarily displaced from those areas, or not respond at all. In areas of repeated and frequent acoustic disturbance, some animals may habituate or learn to tolerate the new baseline or fluctuations in noise level. Habituation can occur when an animal's response to a stimulus wanes with repeated exposure, usually in the absence of unpleasant associated events (Wartzok *et al.*, 2003). While some animals may not return to an area, or may begin using an area differently due to training and testing activities, most animals are expected to return to their usual locations and behavior. Given their documented tolerance of anthropogenic sound (Richardson *et al.*, 1995 and Southall *et al.*, 2007), repeated exposures of individuals (*e.g.*, harbor seals) to levels of sound that may cause Level B harassment are unlikely to result in hearing impairment or to significantly disrupt foraging behavior. As stated above, pinnipeds may habituate to or become tolerant of repeated exposures over time, learning to ignore a stimulus that in the past has not accompanied any overt threat.

Thus, even repeated Level B harassment of some small subset of an overall stock is unlikely to result in any significant realized decrease in fitness to those individuals, and would not result in any adverse impact to the stock as a whole.

The Navy's testing and training activities do occur in areas of specific importance, critical habitat for Hawaiian monk seals. However, monk seals in the main Hawaiian islands have increased while the Navy has continued its activities. The Hawaiian monk seal overall population trend has been on a decline from 2004 through 2013, with the total number of Hawaiian monk seals decreasing by 3.4 percent per year (Carretta *et al.*, 2017). While the decline has been driven by the population segment in the northwestern Hawaiian Islands, the number of documented sightings and annual births in the main Hawaiian Islands has increased since the mid-1990s (Baker, 2004; Baker *et al.*, 2016). In the main Hawaiian Islands, the estimated population growth rate is 6.5 percent per year (Baker *et al.*, 2011; Carretta *et al.*, 2017). Of note, in the 2013 HRC Monitoring Report, tagged monk seals did not show any behavioral changes during periods of MFAS.

Generally speaking, most pinniped stocks in the HSTT Study Area are thought to be stable or increasing. In summary and as described above, the following factors primarily support our preliminary determination that the impacts resulting from the Navy's activities are not expected to adversely affect pinnipeds taken through effects on annual rates of recruitment or survival.

- As described in the "Serious Injury or Mortality" section (Table 68), 0.8 mortalities annually over five years is proposed for authorization for California sea lions. The proposed mortality for California falls below the insignificance threshold and, therefore, we consider the addition an insignificant incremental increase to human-caused mortality. No mortalities of other pinnipeds are proposed for authorization or anticipated to occur.
- As described above, any PTS that may occur is expected to be of a relatively smaller degree because of the unlikelihood that animals would be close enough for a long enough amount of time to incur more severe PTS (for sonar) and the anticipated effectiveness of mitigation in preventing very close exposures for explosives.
- While the majority of takes are caused by exposure during ASW activities, the impacts from these exposures are not expected to have either significant or long-term effects because (and as discussed above):
  - ASW activities typically involve fast-moving assets (relative to marine mammals swim speeds) and individuals are not expected to be exposed either for long periods within a day or over many sequential days.

○ As discussed, the majority of the harassment takes result from hull-mounted sonar during MTEs. When distance cutoffs are applied for pinnipeds, this means that all of the takes from hull-mounted sonar (MF1) result from above exposure 160 dB. However, the majority (*e.g.*, 83 percent) of the takes results from exposures below 172 dB. The majority of the takes have a relatively lower likelihood in have severe impacts.

• As described in detail above (Tables 80 and 81), the scale of the effects are such that pinnipeds are taken an average of less than 2 days per year. While some individuals of California sea lions, Northern fur seal, and harbor seals that might remain in the Navy SOCAL action area for extended periods of time could be taken on more, 17 to 29 days per year. These behavioral takes are not all expected to be of particularly high intensity and nor are they likely to occur over sequential days, which suggests that the overall scale of impacts for any individual would be relatively low. Some California sea lion individuals in SOCAL may occasionally be taken in sequential days, because of the nature of the exposures and the other factors discussed above, any impacts to individual fitness would be limited and with the potential to accrue to no more than a limited number of individuals and would not be expected to affect rates of recruitment or survival. We further note that California sea lions have an increasing population trend.

• The HSTT activities are expected to occur in an area/time of specific importance for reproductive, feeding, or other known critical behaviors for pinnipeds, particularly in critical habitat for ESA-listed Hawaiian monk seal; however, Navy's activities are not anticipated to affect critical habitat. Populations are increasing for monk seals on the main Hawaiian islands.

• Pinnipeds found in the HSTT Study Area are not depleted under the MMPA, nor are they listed under the ESA with the exception of the Hawaiian monk seal and Guadalupe fur seal which are listed as endangered under the ESA and depleted under the MMPA.

Consequently, the activities are not expected to adversely impact rates of recruitment or survival of any of the analyzed stocks of pinnipeds (Table 77 above in this section).

Preliminary Determination

Based on the analysis contained herein of the likely effects of the specified activity on marine mammals and their habitat, and taking into consideration the implementation of the proposed monitoring and mitigation measures, NMFS preliminarily finds that the total marine mammal take from the Specified Activities will have a negligible impact on all affected marine mammal species or stocks.

Subsistence Harvest of Marine Mammals

There are no relevant subsistence uses of marine mammals implicated by this action. Therefore, NMFS has preliminarily determined that the total taking affecting species or stocks would not have an unmitigable adverse impact on the availability of such species or stocks for taking for subsistence purposes.

Endangered Species Act

There are nine marine mammal species under NMFS jurisdiction that are listed as endangered or threatened under the ESA with confirmed or possible occurrence in the Study Area: Blue whale (Eastern and Central North Pacific stocks), fin whale (CA/OR/WA and Hawaiian stocks), gray whale (Western North Pacific stock), humpback whale (Mexico and Central America DPSs), sei whale (Eastern North Pacific and Hawaiian stocks), sperm whale (CA/OR/WA and Hawaiian stocks), false killer whale (Main Hawaiian Islands Insular), Hawaiian monk seal (Hawaiian stock), and Guadalupe fur seal (Mexico to California). There is also critical habitat designated for Hawaiian monk seal and proposed critical habitat for Main Hawaiian Island insular false killer whales. The Navy will consult with NMFS pursuant to section 7 of the ESA, and NMFS will also consult internally on the issuance of LOAs under section 101(a)(5)(A) of the MMPA for HSTT activities. Consultation will be concluded prior to a determination on the issuance of the final rule and LOAs.

National Marine Sanctuaries Act

NMFS will work with NOAA's Office of National Marine Sanctuaries to fulfill our responsibilities under the NMSA as warranted and will complete any NMSA requirements prior to a determination on the issuance of the final rule and LOAs.

National Environmental Policy Act

To comply with the National Environmental Policy Act of 1969 (NEPA; 42 U.S.C. 4321 *et seq.*) and NOAA Administrative Order (NAO) 216–6A, NMFS must review its Specified Activities (*i.e.*, the issuance of an incidental take authorization) with respect to potential impacts on the human environment.

Accordingly, NMFS plans to adopt the Navy's EIS/OEIS for the HSTT Study Area provided our independent evaluation of the document finds that it includes adequate information analyzing the effects on the human environment of issuing regulations and LOAs. NMFS is a cooperating agency on the Navy's HSTT DEIS/OEIS and has worked extensively with the Navy in developing the document.

The Navy's HSTT DEIS/OEIS was made available for public comment at *https://hstteis.com/* on October 13, 2017.

We will review all comments submitted in response to this notice prior to concluding our NEPA process or making a final decision on the final rule and LOA requests.

Classification

The Office of Management and Budget has determined that this proposed rule is not significant for purposes of Executive Order 12866.

Pursuant to the Regulatory Flexibility Act (RFA), the Chief Counsel for Regulation of the Department of Commerce has certified to the Chief Counsel for Advocacy of the Small Business Administration that this proposed rule, if adopted, would not have a significant economic impact on a substantial number of small entities. The RFA requires Federal agencies to prepare an analysis of a rule's impact on small entities whenever the agency is required to publish a notice of proposed rulemaking. However, a Federal agency may certify, pursuant to 5 U.S.C. 605(b), that the action will not have a significant economic impact on a substantial number of small entities. The Navy is the sole entity that would be affected by this rulemaking, and the Navy is not a small governmental jurisdiction, small organization, or small business, as defined by the RFA. Any requirements imposed by an LOA issued pursuant to these regulations, and any monitoring or reporting requirements imposed by these regulations, would be applicable only to the Navy. NMFS does not expect the issuance of these regulations or the associated LOA to result in any impacts to small entities pursuant to the RFA. Because this action, if adopted, would directly affect the Navy and not a small entity, NMFS concludes the action would not result in a significant economic impact on a substantial number of small entities.

List of Subjects in 50 CFR Part 218

Exports, Fish, Imports, Incidental take, Indians, Labeling, Marine mammals, Navy, Penalties, Reporting

and recordkeeping requirements, Seafood, Sonar, Transportation.

Dated: June 14, 2018.

Samuel D. Rauch III,

Deputy Assistant Administrator for Regulatory Programs, National Marine Fisheries Service.

PART 218—REGULATIONS GOVERNING THE TAKING AND IMPORTING OF MARINE MAMMALS

■ 1. The authority citation for part 218 continues to read as follows:

Authority: 16 U.S.C. 1361 *et seq.*

■ 2. Revise subpart H to part 218 to read as follows:

Sec.

218.70 Specified activity and specified geographical region.
218.71 Effective dates.
218.72 Permissible methods of taking.
218.73 Prohibitions.
218.74 Mitigation requirements.
218.75 Requirements for monitoring and reporting.
218.76 Letters of Authorization.
218.77 Renewals and modifications of Letters of Authorization
218.78 [Reserved]
218.79 [Reserved]

Subpart H—Taking and Importing Marine Mammals; U.S. Navy's Hawaii-Southern California Training and Testing (HSTT)

§ 218.70 Specified activity and specified geographical region.

(a) Regulations in this subpart apply only to the U.S. Navy for the taking of marine mammals that occurs in the area outlined in paragraph (b) of this section and that occurs incidental to the activities described in paragraph (c) of this section.

(b) The taking of marine mammals by the Navy may be authorized in Letters of Authorization (LOAs) only if it occurs within the Hawaii-Southern California Training and Testing (HSTT) Study Area, which includes established operating and warning areas across the north-central Pacific Ocean, from the mean high tide line in Southern California west to Hawaii and the International Date Line. The Study Area includes the at-sea areas of three existing range complexes (the Hawaii Range Complex (HRC), the Southern California Range Complex (SOCAL), and the Silver Strand Training Complex, and overlaps a portion of the Point Mugu Sea Range (PMSR)). Also included in the Study Area are Navy pierside locations in Hawaii and Southern California, Pearl Harbor, San Diego Bay, and the transit corridor on the high seas where sonar training and testing may occur.

(c) The taking of marine mammals by the Navy is only authorized if it occurs incidental to the Navy's conducting training and testing activities. The Navy's use of sonar and other transducers, in-water detonations, air guns, pile driving/extraction, and vessel movements incidental to training and testing exercises may cause take by harassment, serious injury or mortality as defined by the MMPA through the various warfare mission areas in which the Navy would conduct including amphibious warfare, anti-submarine warfare, expeditionary warfare, surface warfare, mine warfare, and other activities (sonar and other transducers, pile driving and removal activities, air guns, vessel strike).

§ 218.71 Effective dates.

Regulations in this subpart are effective [*date 30 days after date of publication of the final rule in the* ***Federal Register***] through [*date 5 years and 30 days after date of publication of the final rule in the* ***Federal Register***].

§ 218.72 Permissible methods of taking.

Under LOAs issued pursuant to § 216.106 of this chapter and § 218.77, the Holder of the LOAs (hereinafter "Navy") may incidentally, but not intentionally, take marine mammals within the area described in § 218.70(b) by Level A harassment and Level B harassment associated with the use of active sonar and other acoustic sources and explosives as well as serious injury or mortality associated with vessel strikes provided the activity is in compliance with all terms, conditions, and requirements of these regulations in this subpart and the applicable LOAs.

§ 218.73 Prohibitions.

Notwithstanding takings contemplated in § 218.72 and authorized by LOAs issued under § 216.106 of this chapter and § 218.76, no person in connection with the activities described in § 218.72 may:

(a) Violate, or fail to comply with, the terms, conditions, and requirements of this subpart or an LOA issued under § 216.106 of this chapter and § 218.76;

(b) Take any marine mammal not specified in such LOAs;

(c) Take any marine mammal specified in such LOAs in any manner other than as specified;

(d) Take a marine mammal specified in such LOAs if NMFS determines such taking results in more than a negligible impact on the species or stocks of such marine mammal; or or

(e) Take a marine mammal specified in such LOAs if NMFS determines such taking results in an unmitigable adverse impact on the species or stock of such marine mammal for taking for subsistence uses.

§ 218.74 Mitigation requirements.

When conducting the activities identified in § 218.70(c), the mitigation measures contained in any LOAs issued under § 216.106 of this chapter and § 218.76 must be implemented. These mitigation measures shall include the following requirements, but are not limited to:

(a) *Procedural Mitigation.* Procedural mitigation is mitigation that the Navy shall implement whenever and wherever an applicable training or testing activity takes place within the HSTT Study Area for each applicable activity category or stressor category and includes acoustic stressors (*i.e.*, active sonar, air guns, pile driving, weapons firing noise), explosive stressors (*i.e.*, sonobuoys, torpedoes, medium-caliber and large-caliber projectiles, missiles and rockets, bombs, sinking exercises, mines, anti-swimmer grenades, and mat weave and obstacle loading), and physical disturbance and strike stressors (*i.e.*, vessel movement, towed in-water devices, small-, medium-, and large-caliber non-explosive practice munitions, non-explosive missiles and rockets, non-explosive bombs and mine shapes).

(1) *Environmental Awareness and Education.* Appropriate personnel involved in mitigation and training or testing activity reporting under the Specified Activities shall complete one or more modules of the U.S Navy Afloat Environmental Compliance Training Series, as identified in their career path training plan. Modules include: Introduction to the U.S. Navy Afloat Environmental Compliance Training Series, Marine Species Awareness Training, U.S. Navy Protective Measures Assessment Protocol, and U.S. Navy Sonar Positional Reporting System and Marine Mammal Incident Reporting. Additionally, to increase the environmental awareness of naval assets operating in designated areas to the potential seasonal presence of concentrations of large whales, including humpback whales, gray whales, blue whales, and fin whales, the Navy will issue seasonal awareness notification messages. These messages include:

(i) Humpback Whale Awareness Notification Message Area (November 15–April 15). The Navy shall issue a seasonal awareness notification message to alert ships and aircraft operating in the area to the possible presence of concentrations of large whales,

including humpback whales. To maintain safety of navigation and to avoid interactions with large whales during transits, the Navy shall instruct vessels to remain vigilant to the presence of large whale species (including humpback whales), that when concentrated seasonally, may become vulnerable to vessel strikes. Lookouts shall use the information from the awareness notification message to assist their visual observation of applicable mitigation zones during training and testing activities and to aid in the implementation of procedural mitigation.

(ii) Blue Whale Awareness Notification Message Area (June 1–October 31). The Navy shall issue a seasonal awareness notification message to alert ships and aircraft operating in the area to the possible presence of concentrations of large whales, including blue whales. To maintain safety of navigation and to avoid interactions with large whales during transits, the Navy shall instruct vessels to remain vigilant to the presence of large whale species (including blue whales), that when concentrated seasonally, may become vulnerable to vessel strikes. Lookouts shall use the information from the awareness notification messages to assist their visual observation of applicable mitigation zones during training and testing activities and to aid in the implementation of procedural mitigation observation of applicable mitigation zones during training and testing activities and to aid in the implementation of procedural mitigation.

(iii) Gray Whale Awareness Notification Message Area (November 1–March 31). The Navy shall issue a seasonal awareness notification message to alert ships and aircraft operating in the area to the possible presence of concentrations of large whales, including gray whales. To maintain safety of navigation and to avoid interactions with large whales during transits, the Navy shall instruct vessels to remain vigilant to the presence of large whale species (including gray whales), that when concentrated seasonally, may become vulnerable to vessel strikes. Lookouts shall use the information from the awareness notification messages to assist their visual observation of applicable mitigation zones during training and testing activities and to aid in the implementation of procedural mitigation.

(iv) Fin Whale Awareness Notification Message Area (November 1–May 31). The Navy shall issue a seasonal awareness notification message to alert ships and aircraft operating in the area to the possible presence of concentrations of large whales, including fin whales. To maintain safety of navigation and to avoid interactions with large whales during transits, the Navy shall instruct vessels to remain vigilant to the presence of large whale species (including fin whales), that when concentrated seasonally, may become vulnerable to vessel strikes. Lookouts shall use the information from the awareness notification messages to assist their visual observation of applicable mitigation zones during training and testing activities and to aid in implementation of procedural mitigation.

(2) *Active Sonar.* Active sonar includes low-frequency active sonar, mid-frequency active sonar, and high-frequency active sonar. For vessel-based active sonar activities, mitigation applies only to sources that are positively controlled and deployed from manned surface vessels (*e.g.*, sonar sources towed from manned surface platforms). For aircraft-based active sonar activities, mitigation applies to sources that are positively controlled and deployed from manned aircraft that do not operate at high altitudes (*e.g.*, rotary-wing aircraft). Mitigation does not apply to active sonar sources deployed from unmanned aircraft or aircraft operating at high altitudes (*e.g.*, maritime patrol aircraft).

(i) Number of Lookouts and Observation Platform—(A) Hull-mounted sources: Two lookouts at the forward part of the ship for platforms without space or manning restrictions while underway; One lookout at the forward part of a small boat or ship for platforms with space or manning restrictions while underway; and One lookout for platforms using active sonar while moored or at anchor (including pierside).

(B) Non-hull mounted sources: One lookout on the ship or aircraft conducting the activity.

(ii) Mitigation Zone and Requirements—(A) Prior to the start of the activity the Navy shall observe for floating vegetation and marine mammals; if resource is observed, the Navy shall not commence use of active sonar.

(B) During low-frequency active sonar at or above 200 decibel (dB) and hull-mounted mid-frequency active sonar the Navy shall observe for marine mammals and power down active sonar transmission by 6 dB if resource is observed within 1,000 yards (yd) of the sonar source; power down by an additional 4 dB (10 dB total) if resource is observed within 500 yd of the sonar source; and cease transmission if resource is observed within 200 yd of the sonar source.

(C) During low-frequency active sonar below 200 dB, mid-frequency active sonar sources that are not hull mounted, and high-frequency active sonar the Navy shall observe for marine mammals and cease active sonar transmission if resource is observed within 200 yd of the sonar source.

(D) To allow an observed marine mammal to leave the mitigation zone, the Navy shall not recommence active sonar transmission until one of the recommencement conditions has been met: The animal is observed exiting the mitigation zone; the animal is thought to have exited the mitigation zone based on a determination of its course, speed, and movement relative to the sonar source; the mitigation zone has been clear from any additional sightings for 10 min for aircraft-deployed sonar sources or 30 min for vessel-deployed sonar sources; for mobile activities, the active sonar source has transited a distance equal to double that of the mitigation zone size beyond the location of the last sighting; or for activities using hull-mounted sonar, the lookout concludes that dolphins are deliberately closing in on the ship to ride the ship's bow wave, and are therefore out of the main transmission axis of the sonar (and there are no other marine mammal sightings within the mitigation zone).

(3) *Air Guns.* (i) Number of Lookouts and Observation Platform—One lookout positioned on a ship or pierside.

(ii) Mitigation Zone and Requirements—150 yd around the air gun.

(A) Prior to the start of the activity (*e.g.*, when maneuvering on station), the Navy shall observe for floating vegetation, and marine mammals; if resource is observed, the Navy shall not commence use of air guns.

(B) During the activity, the Navy shall observe for marine mammals; if resource is observed, the Navy shall cease use of air guns.

(C) To allow an observed marine mammal to leave the mitigation zone, the Navy shall not recommence the use of air guns until one of the recommencement conditions has been met: The animal is observed exiting the mitigation zone; the animal is thought to have exited the mitigation zone based on a determination of its course, speed, and movement relative to the air gun; the mitigation zone has been clear from any additional sightings for 30 min; or for mobile activities, the air gun has transited a distance equal to double that

of the mitigation zone size beyond the location of the last sighting.

(4) *Pile Driving.* Pile driving and pile extraction sound during Elevated Causeway System training.

(i) Number of Lookouts and Observation Platform—One lookout positioned on the shore, the elevated causeway, or a small boat.

(ii) Mitigation Zone and Requirements—100 yd around the pile driver.

(A) Thirty minutes prior to the start of the activity, the Navy shall observe for floating vegetation and marine mammals; if resource is observed, the Navy shall not commence impact pile driving or vibratory pile extraction.

(B) During the activity, the Navy shall observe for marine mammals; if resource is observed, the Navy shall cease impact pile driving or vibratory pile extraction.

(C) To allow an observed marine mammal to leave the mitigation zone, the Navy shall not recommence pile driving until one of the recommencement conditions has been met: The animal is observed exiting the mitigation zone; the animal is thought to have exited the mitigation zone based on a determination of its course, speed, and movement relative to the pile driving location; or the mitigation zone has been clear from any additional sightings for 30 min.

(5) *Weapons Firing Noise.* Weapons firing noise associated with large-caliber gunnery activities.

(i) Number of Lookouts and Observation Platform—One lookout shall be positioned on the ship conducting the firing. Depending on the activity, the lookout could be the same as the one described in Explosive Medium-Caliber and Large-Caliber Projectiles or in Small-, Medium-and Large-Caliber Non-Explosive Practice Munitions.

(ii) Mitigation Zone and Requirements—Thirty degrees on either side of the firing line out to 70 yd from the muzzle of the weapon being fired.

(A) Prior to the start of the activity, the Navy shall observe for floating vegetation, and marine mammals; if resource is observed, the Navy shall not commence weapons firing.

(B) During the activity, the Navy shall observe for marine mammals; if resource is observed, the Navy shall cease weapons firing.

(C) To allow an observed marine mammal to leave the mitigation zone, the Navy shall not recommence weapons firing until one of the recommencement conditions has been met: The animal is observed exiting the mitigation zone; the animal is thought to have exited the mitigation zone based on a determination of its course, speed, and movement relative to the firing ship; the mitigation zone has been clear from any additional sightings for 30 min; or for mobile activities, the firing ship has transited a distance equal to double that of the mitigation zone size beyond the location of the last sighting.

(6) *Explosive Sonobuoys.* (i) Number of Lookouts and Observation Platform—One lookout positioned in an aircraft or on small boat.

(ii) Mitigation Zone and Requirements—600 yd around an explosive sonobuoy.

(A) Prior to the start of the activity (*e.g.*, during deployment of a sonobuoy field, which typically lasts 20–30 min), the Navy shall conduct passive acoustic monitoring for marine mammals, and observe for floating vegetation and marine mammals; if resource is visually observed, the Navy shall not commence sonobuoy or source/receiver pair detonations.

(B) During the activity, the Navy shall observe for marine mammals; if resource is observed, the Navy shall cease sonobuoy or source/receiver pair detonations.

(C) To allow an observed marine mammal to leave the mitigation zone, the Navy shall not recommence the use of explosive sonobuoys until one of the recommencement conditions has been met: The animal is observed exiting the mitigation zone; the animal is thought to have exited the mitigation zone based on a determination of its course, speed, and movement relative to the sonobuoy; or the mitigation zone has been clear from any additional sightings for 10 min when the activity involves aircraft that have fuel constraints, or 30 min when the activity involves aircraft that are not typically fuel constrained.

(7) *Explosive Torpedoes.* (i) Number of Lookouts and Observation Platform—One lookout positioned in an aircraft.

(ii) Mitigation Zone and Requirements—2,100 yd around the intended impact location.

(A) Prior to the start of the activity (*e.g.*, during deployment of the target), the Navy shall conduct passive acoustic monitoring for marine mammals, and observe for floating vegetation, jellyfish aggregations, and marine mammals; if resource is visually observed, the Navy shall not commence firing.

(B) During the activity, the Navy shall observe for marine mammals and jellyfish aggregations; if resource is observed, the Navy shall cease firing.

(C) To allow an observed marine mammal to leave the mitigation zone, the Navy shall not recommence firing until one of the recommencement conditions has been met: The animal is observed exiting the mitigation zone; the animal is thought to have exited the mitigation zone based on a determination of its course, speed, and movement relative to the intended impact location; or the mitigation zone has been clear from any additional sightings for 10 min when the activity involves aircraft that have fuel constraints, or 30 min when the activity involves aircraft that are not typically fuel constrained. After completion of the activity, the Navy shall observe for marine mammals; if any injured or dead resources are observed, the Navy shall follow established incident reporting procedures.

(8) *Explosive Medium-Caliber and Large-Caliber Projectiles.* Gunnery activities using explosive medium-caliber and large-caliber projectiles. Mitigation applies to activities using a surface target.

(i) Number of Lookouts and Observation Platform—One Lookout on the vessel or aircraft conducting the activity. For activities using explosive large-caliber projectiles, depending on the activity, the Lookout could be the same as the one described in Weapons Firing Noise in paragraph (a)(5)(i) of this section.

(ii) Mitigation Zone and Requirements—(A) 200 yd around the intended impact location for air-to-surface activities using explosive medium-caliber projectiles,

(B) 600 yd around the intended impact location for surface-to-surface activities using explosive medium-caliber projectiles, or

(C) 1,000 yd around the intended impact location for surface-to-surface activities using explosive large-caliber projectiles.

(D) Prior to the start of the activity (*e.g.*, when maneuvering on station), the Navy shall observe for floating vegetation and marine mammals; if resource is observed, the Navy shall not commence firing.

(E) During the activity, observe for marine mammals; if resource is observed, the Navy shall cease firing.

(F) To allow an observed marine mammal to leave the mitigation zone, the Navy shall not recommence firing until one of the recommencement conditions has been met: The animal is observed exiting the mitigation zone; the animal is thought to have exited the mitigation zone based on a determination of its course, speed, and movement relative to the intended impact location; the mitigation zone has been clear from any additional sightings for 10 min for aircraft-based firing or 30 min for vessel-based firing; or for activities using mobile targets, the

intended impact location has transited a distance equal to double that of the mitigation zone size beyond the location of the last sighting.

(9) *Explosive Missiles and Rockets.* Aircraft-deployed explosive missiles and rockets. Mitigation applies to activities using a surface target.

(i) Number of Lookouts and Observation Platform—One lookout positioned in an aircraft.

(ii) Mitigation Zone and Requirements—(A) 900 yd around the intended impact location for missiles or rockets with 0.6–20 lb net explosive weight, or

(B) 2,000 yd around the intended impact location for missiles with 21–500 lb net explosive weight.

(C) Prior to the start of the activity (*e.g.*, during a fly-over of the mitigation zone), the Navy shall observe for floating vegetation and marine mammals; if resource is observed, the Navy shall not commence firing.

(D) During the activity, the Navy shall observe for marine mammals; if resource is observed, the Navy shall cease firing.

(E) To allow an observed marine mammal to leave the mitigation zone, the Navy shall not recommence firing until one of the recommencement conditions has been met: The animal is observed exiting the mitigation zone; the animal is thought to have exited the mitigation zone based on a determination of its course, speed, and movement relative to the intended impact location; or the mitigation zone has been clear from any additional sightings for 10 min when the activity involves aircraft that have fuel constraints, or 30 min when the activity involves aircraft that are not typically fuel constrained.

(10) *Explosive Bombs.* (i) Number of Lookouts and Observation Platform—One lookout positioned in an aircraft conducting the activity.

(ii) Mitigation Zone and Requirements—2,500 yd around the intended target.

(A) Prior to the start of the activity (*e.g.*, when arriving on station), the Navy shall observe for floating vegetation and marine mammals; if resource is observed, the Navy shall not commence bomb deployment.

(B) During target approach, the Navy shall observe for marine mammals; if resource is observed, the Navy shall cease bomb deployment.

(C) To allow an observed marine mammal to leave the mitigation zone, the Navy shall not recommence bomb deployment until one of the recommencement conditions has been met: The animal is observed exiting the mitigation zone; the animal is thought to have exited the mitigation zone based on a determination of its course, speed, and movement relative to the intended target; the mitigation zone has been clear from any additional sightings for 10 min; or for activities using mobile targets, the intended target has transited a distance equal to double that of the mitigation zone size beyond the location of the last sighting.

(11) *Sinking Exercises.* (i) Number of Lookouts and Observation Platform—Two lookouts (one positioned in an aircraft and one on a vessel).

(ii) Mitigation Zone and Requirements—2.5 nmi around the target ship hulk.

(A) 90 min prior to the first firing, the Navy shall conduct aerial observations for floating vegetation, jellyfish aggregations, and marine mammals; if resource is observed, the Navy shall not commence firing.

(B) During the activity, the Navy shall conduct passive acoustic monitoring and visually observe for marine mammals from the vessel; if resource is visually observed, the Navy shall cease firing.

(C) Immediately after any planned or unplanned breaks in weapons firing of longer than 2 hrs, the Navy shall observe for marine mammals from the aircraft and vessel; if resource is observed, the Navy shall not commence firing.

(D) To allow an observed marine mammal to leave the mitigation zone, the Navy shall not recommence firing until one of the recommencement conditions has been met: The animal is observed exiting the mitigation zone; the animal is thought to have exited the mitigation zone based on a determination of its course, speed, and movement relative to the target ship hulk; or the mitigation zone has been clear from any additional sightings for 30 min.

(E) For 2 hrs after sinking the vessel (or until sunset, whichever comes first), the Navy shall observe for marine mammals; if any injured or dead resources are observed, the Navy shall follow established incident reporting procedures.

(12) *Explosive Mine Countermeasure and Neutralization Activities.*

(i) Number of Lookouts and Observation Platform—(A) One lookout positioned on a vessel or in an aircraft when using up to 0.1–5 lb net explosive weight charges.

(B) Two lookouts (one in an aircraft and one on a small boat) when using up to 6–650 lb net explosive weight charges.

(ii) Mitigation Zone and Requirements—(A) 600 yd around the detonation site for activities using 0.1–5 lb net explosive weight, or

(B) 2,100 yd around the detonation site for activities using 6–650 lb net explosive weight (including high explosive target mines).

(C) Prior to the start of the activity (*e.g.*, when maneuvering on station; typically, 10 min when the activity involves aircraft that have fuel constraints, or 30 min when the activity involves aircraft that are not typically fuel constrained), the Navy shall observe for floating vegetation and marine mammals; if resource is observed, the Navy shall not commence detonations.

(D) During the activity, the Navy shall observe for marine mammals; if resource is observed, the Navy shall cease detonations.

(E) To allow an observed marine mammal to leave the mitigation zone, the Navy shall not recommence detonations until one of the recommencement conditions has been met: The animal is observed exiting the mitigation zone; the animal is thought to have exited the mitigation zone based on a determination of its course, speed, and movement relative to detonation site; or the mitigation zone has been clear from any additional sightings for 10 min when the activity involves aircraft that have fuel constraints, or 30 min when the activity involves aircraft that are not typically fuel constrained.

(F) After completion of the activity, the Navy shall observe for marine mammals and sea turtles (typically 10 min when the activity involves aircraft that have fuel constraints, or 30 min. when the activity involves aircraft that are not typically fuel constrained); if any injured or dead resources are observed, the Navy shall follow established incident reporting procedures.

(13) *Explosive Mine Neutralization Activities Involving Navy Divers.*

(i) Number of Lookouts and Observation Platform—(A) Two lookouts (two small boats with one Lookout each, or one Lookout on a small boat and one in a rotary-wing aircraft) when implementing the smaller mitigation zone.

(B) Four lookouts (two small boats with two Lookouts each), and a pilot or member of an aircrew shall serve as an additional Lookout if aircraft are used during the activity, when implementing the larger mitigation zone.

(ii) Mitigation Zone and Requirements—(A) The Navy shall not set time-delay firing devices (0.1–29 lb net explosive weight) to exceed 10 min.

(B) 500 yd around the detonation site during activities under positive control using 0.1–20 lb net explosive weight, or

(C) 1,000 yd around the detonation site during all activities using time-delay fuses (0.1–29 lb net explosive weight) and during activities under positive control using 21–60 lb net explosive weight charges.

(D) Prior to the start of the activity (*e.g.*, when maneuvering on station for activities under positive control; 30 min for activities using time-delay firing devices), the Navy shall observe for floating vegetation and marine mammals; if resource is observed, the Navy shall not commence detonations or fuse initiation.

(E) During the activity, the Navy shall observe for marine mammals; if resource is observed, the Navy shall cease detonations or fuse initiation. All divers placing the charges on mines shall support the Lookouts while performing their regular duties and shall report all marine mammal sightings to their supporting small boat or Range Safety Officer. To the maximum extent practicable depending on mission requirements, safety, and environmental conditions, boats shall position themselves near the mid-point of the mitigation zone radius (but outside of the detonation plume and human safety zone), shall position themselves on opposite sides of the detonation location (when two boats are used), and shall travel in a circular pattern around the detonation location with one Lookout observing inward toward the detonation site and the other observing outward toward the perimeter of the mitigation zone. If used, aircraft shall travel in a circular pattern around the detonation location to the maximum extent practicable.

(F) To allow an observed marine mammal to leave the mitigation zone, the Navy shall not recommence detonations or fuse initiation until one of the recommencement conditions has been met: The animal is observed exiting the mitigation zone; the animal is thought to have exited the mitigation zone based on a determination of its course, speed, and movement relative to the detonation site; or the mitigation zone has been clear from any additional sightings for 10 min during activities under positive control with aircraft that have fuel constraints, or 30 min during activities under positive control with aircraft that are not typically fuel constrained and during activities using time-delay firing devices.

(G) After completion of an activity using time-delay firing devices, the Navy shall observe for marine mammals for 30 min; if any injured or dead resources are observed, the Navy follow established incident reporting procedures.

(14) *Maritime Security Operations—Anti-Swimmer Grenades.* (i) Number of Lookouts and Observation Platform—One lookout positioned on the small boat conducting the activity.

(ii) Mitigation Zone and Requirements—200 yd around the intended detonation location.

(A) Prior to the start of the activity (*e.g.*, when maneuvering on station), the Navy shall observe for floating vegetation and marine mammals; if resource is observed, the Navy shall not commence detonations.

(B) During the activity, the Navy shall observe for marine mammals; if resource is observed, the Navy shall cease detonations.

(C) To allow an observed marine mammal to leave the mitigation zone, the Navy shall not recommence detonations until one of the recommencement conditions has been met: The animal is observed exiting the mitigation zone; the animal is thought to have exited the mitigation zone based on a determination of its course, speed, and movement relative to the intended detonation location; the mitigation zone has been clear from any additional sightings for 30 min; or the intended detonation location has transited a distance equal to double that of the mitigation zone size beyond the location of the last sighting.

(15) *Under Demolition Multiple Charge—Mat Weave and Obstacle Loading.* (i) Number of Lookouts and Observation Platform—Two Lookouts (one positioned on a small boat and one positioned on shore from an elevated platform).

(ii) Mitigation Zone and Requirements—700 yd around the intended detonation site.

(A) For 30 min prior to the first detonation, the Lookout positioned on a small boat shall observe for floating vegetation and marine mammals; if resource is observed, the Navy shall not commence the initial detonation.

(B) For 10 min prior to the first detonation, the Lookout positioned on shore shall use binoculars to observe for marine mammals; if resource is observed, the Navy shall not commence the initial detonation until the mitigation zone has been clear of any additional sightings for a minimum of 10 min.

(C) During the activity, the Navy shall observe for marine mammals; if resource is observed, the Navy shall cease detonations.

(D) To allow an observed marine mammal to leave the mitigation zone, the Navy shall not recommence detonations until one of the recommencement conditions has been met: The animal is observed exiting the mitigation zone; the animal is thought to have exited the mitigation zone based on a determination of its course, speed, and movement relative to the detonation site; or the mitigation zone has been clear from any additional sightings for 10 min (as determined by the shore observer).

(E) After completion of the activity, the Lookout positioned on a small boat shall observe for marine mammals for 30 min; if any injured or dead resources are observed, the Navy shall follow established incident reporting procedures.

(16) *Vessel Movement.* The mitigation shall not be applied if: The vessel's safety is threatened; the vessel is restricted in its ability to maneuver (*e.g.*, during launching and recovery of aircraft or landing craft, during towing activities, when mooring, etc.); the vessel is operated autonomously; or when impracticable based on mission requirements (*e.g.*, during Amphibious Assault—Battalion Landing exercise).

(i) Number of Lookouts and Observation Platform—One lookout on the vessel that is underway.

(ii) Mitigation Zone and Requirements—(A) 500 yd around whales—When underway, the Navy shall observe for marine mammals; if a whale is observed, the Navy shall maneuver to maintain distance.

(B) 200 yd around all other marine mammals (except bow-riding dolphins and pinnipeds hauled out on man-made navigational structures, port structures, and vessels)—When underway, the Navy shall observe for marine mammals; if a marine mammal other than a whale, bow-riding dolphin, or hauled-out pinniped is observed, the Navy shall maneuver to maintain distance.

(17) *Towed In-water Devices.* Mitigation applies to devices that are towed from a manned surface platform or manned aircraft. The mitigation shall not be applied if the safety of the towing platform or in-water device is threatened.

(i) Number of Lookouts and Observation Platform—One lookout positioned on a manned towing platform.

(ii) Mitigation Zone and Requirements—250 yd around marine mammals. When towing an in-water device, the Navy shall observe for marine mammals; if resource is observed, the Navy shall maneuver to maintain distance.

(18) *Small-, Medium-, and Large-Caliber Non-Explosive Practice Munitions.* Mitigation applies to activities using a surface target.

(i) Number of Lookouts and Observation Platform—One Lookout positioned on the platform conducting the activity. Depending on the activity, the Lookout could be the same as the one described for Weapons Firing Noise in paragraph (a)(5)(i) of this section.

(ii) Mitigation Zone and Requirements—200 yd around the intended impact location.

(A) Prior to the start of the activity (*e.g.*, when maneuvering on station), the Navy shall observe for floating vegetation and marine mammals; if resource is observed, the Navy shall not commence firing.

(B) During the activity, the Navy shall observe for marine mammals; if resource is observed, the Navy shall cease firing.

(C) To allow an observed marine mammal to leave the mitigation zone, the Navy shall not recommence firing until one of the recommencement conditions has been met: The animal is observed exiting the mitigation zone; the animal is thought to have exited the mitigation zone based on a determination of its course, speed, and movement relative to the intended impact location; the mitigation zone has been clear from any additional sightings for 10 min for aircraft-based firing or 30 min for vessel-based firing; or for activities using a mobile target, the intended impact location has transited a distance equal to double that of the mitigation zone size beyond the location of the last sighting.

(19) *Non-Explosive Missiles and Rockets.* Aircraft-deployed non-explosive missiles and rockets. Mitigation applies to activities using a surface target.

(i) Number of Lookouts and Observation Platform—One Lookout positioned in an aircraft.

(ii) Mitigation Zone and Requirements—900 yd around the intended impact location.

(A) Prior to the start of the activity (*e.g.*, during a fly-over of the mitigation zone), the Navy shall observe for floating vegetation and marine mammals; if resource is observed, the Navy shall not commence firing.

(B) During the activity, the Navy shall observe for marine mammals; if resource is observed, the Navy shall cease firing.

(C) To allow an observed marine mammal to leave the mitigation zone, the Navy shall not recommence firing until one of the recommencement conditions has been met: The animal is observed exiting the mitigation zone; the animal is thought to have exited the mitigation zone based on a determination of its course, speed, and movement relative to the intended impact location; or the mitigation zone has been clear from any additional sightings for 10 min when the activity involves aircraft that have fuel constraints, or 30 min when the activity involves aircraft that are not typically fuel constrained.

(20) *Non-Explosive Bombs and Mine Shapes.* Non-explosive bombs and non-explosive mine shapes during mine laying activities.

(i) Number of Lookouts and Observation Platform—One Lookout positioned in an aircraft.

(ii) Mitigation Zone and Requirements—1,000 yd around the intended target.

(A) Prior to the start of the activity (*e.g.*, when arriving on station), the Navy shall observe for floating vegetation and marine mammals; if resource is observed, the Navy shall not commence bomb deployment or mine laying.

(B) During approach of the target or intended minefield location, the Navy shall observe for marine mammals; if resource is observed, the Navy shall cease bomb deployment or mine laying.

(C) To allow an observed marine mammal to leave the mitigation zone, the Navy shall not recommence bomb deployment or mine laying until one of the recommencement conditions has been met: the animal is observed exiting the mitigation zone; the animal is thought to have exited the mitigation zone based on a determination of its course, speed, and movement relative to the intended target or minefield location; the mitigation zone has been clear from any additional sightings for 10 min; or for activities using mobile targets, the intended target has transited a distance equal to double that of the mitigation zone size beyond the location of the last sighting.

(b) *Mitigation Areas.* In addition to procedural mitigation, the Navy shall implement mitigation measures within mitigation areas to avoid or reduce potential impacts on marine mammals.

(1) *Mitigation Areas Marine Mammals in the Hawaii Range Complex* for sonar, explosives, and strikes.

(i) Mitigation Area Requirements—(A) Hawaii Island Mitigation Area (year-round):

(*1*) The Navy shall not exceed 300 hours of MFAS sensor MF1 (MF1) and 20 hours of MFAS sensor MF4 (MF4) annually.

(*2*) Should national security present a requirement to conduct more than 300 hrs of MF1 or 20 hrs of MF4 per year, naval units will obtain permission from the appropriate designated Command authority prior to commencement of the activity. The Navy will provide NMFS with advance notification and include the information (*e.g.*, hours of sonar usage) in its annual activity reports.

(*3*) The Navy shall not use explosives during training or testing activities. Explosive restrictions within the Hawaii Island Mitigation Area apply only to those activities for which the Navy seeks MMPA authorization (*e.g.*, surface-to-surface or air-to-surface missile and gunnery events, BOMBEX, and mine neutralization).

(*4*) Should national security present a requirement for the use of explosives in the area, naval units will obtain permission from the appropriate designated Command authority prior to commencement of the activity. The Navy will provide NMFS with advance notification and include the information (*e.g.*, explosives usage) in its annual activity reports.

(B) 4-Islands Region Mitigation Area (November 15–April 15):

(*1*) The Navy shall not use MFAS sensor MF1 during training or testing activities from November 15–April 15.

(*2*) Should national security present a requirement for the use of MF1 in the area from November 15–April 15, naval units will obtain permission from the appropriate designated Command authority prior to commencement of the activity. The Navy will provide NMFS with advance notification and include the information (*e.g.*, hours of sonar usage) in its annual activity reports.

(ii) [Reserved]

(2) *Mitigation Areas Marine Mammals in the Southern California Portion of the Study Area* for sonar, explosives, and strikes.

(i) Mitigation Area Requirements—(A) San Diego Arc Mitigation Area (June 1–October 31):

(*1*) The Navy shall not exceed 200 hours of MFAS sensor MF1 (with the exception of active sonar maintenance and systems checks) per season annually.

(*2*) Should national security present a requirement to conduct more than 200 hrs of MF1 (with the exception of active sonar maintenance and systems checks) per year from June 1–October 31, naval units will obtain permission from the appropriate designated Command authority prior to commencement of the activity. The Navy will provide NMFS with advance notification and include the information (*e.g.*, hours of sonar usage) in its annual activity reports.

(*3*) The Navy shall not use explosives during large-caliber gunnery, torpedo, bombing, and missile (including 2.75

inch rockets) activities during training or testing activities.

(4) Should national security present a requirement to conduct large-caliber gunnery, torpedo, bombing, and missile (including 2.75 inch rockets) activities using explosives, naval units will obtain permission from the appropriate designated Command authority prior to commencement of the activity. The Navy will provide NMFS with advance notification and include the information (*e.g.*, explosives usage) in its annual activity reports.

(B) Santa Barbara Island Mitigation Area (year-round):

(1) The Navy shall not use MFAS sensor MF1 and explosives used in small-, medium-, and large-caliber gunnery; torpedo; bombing; and missile (including 2.75 inch rockets) activities during unit-level training or MTEs.

(2) Should national security present a requirement for the use of mid-frequency active anti-submarine warfare sensor MF1 or explosives in small-, medium-, and large-caliber gunnery; torpedo; bombing; and missile (including 2.75 inch rockets) activities during unit-level training or major training exercises for national security, naval units will obtain permission from the appropriate designated Command authority prior to commencement of the activity. The Navy will provide NMFS with advance notification and include the information in its annual activity reports.

(ii) [Reserved]

§ 218.75 Requirements for monitoring and reporting.

(a) The Navy must notify NMFS immediately (or as soon as operational security considerations allow) if the specified activity identified in § 218.70 is thought to have resulted in the mortality or injury of any marine mammals, or in any take of marine mammals not identified in this subpart.

(b) The Navy must conduct all monitoring and required reporting under the LOAs, including abiding by the HSTT Study Area monitoring program. Details on program goals, objectives, project selection process, and current projects available at *www.navymarinespeciesmonitoring.us.*

(c) Notification of injured, live stranded, or dead marine mammals. The Navy shall abide by the Notification and Reporting Plan, which sets out notification, reporting, and other requirements when dead, injured, or live stranded marine mammals are detected.

(d) Annual HSTT Study Area marine species monitoring report. The Navy shall submit an annual report of the HSTT Study Area monitoring describing the implementation and results from the previous calendar year. Data collection methods shall be standardized across range complexes and study areas to allow for comparison in different geographic locations. The report shall be submitted either three months after the calendar year, or three months after the conclusion of the monitoring year to be determined by the Adaptive Management process to the Director, Office of Protected Resources, NMFS. Such a report would describe progress of knowledge made with respect to intermediate scientific objectives within the HSTT Study Area associated with the Integrated Comprehensive Monitoring Program. Similar study questions shall be treated together so that progress on each topic shall be summarized across all Navy ranges. The report need not include analyses and content that does not provide direct assessment of cumulative progress on the monitoring plan study questions. As an alternative, the Navy may submit a multi-Range Complex annual Monitoring Plan report to fulfill this requirement. Such a report would describe progress of knowledge made with respect to monitoring study questions across multiple Navy ranges associated with the ICMP. Similar study questions shall be treated together so that progress on each topic shall be summarized across multiple Navy ranges. The report need not include analyses and content that does not provide direct assessment of cumulative progress on the monitoring study question. This will continue to allow Navy to provide a cohesive monitoring report covering multiple ranges (as per ICMP goals), rather than entirely separate reports for the HSTT, Gulf of Alaska, Mariana Islands, and the Northwest Study Areas, etc.

(e) Annual HSTT Training Exercise Report and Testing Activity Report. Each year, the Navy shall submit two preliminary reports (Quick Look Report) detailing the status of authorized sound sources within 21 days after the anniversary of the date of issuance of each LOA to the Director, Office of Protected Resources, NMFS. Each year, the Navy shall submit detailed reports to the Director, Office of Protected Resources, NMFS within 3 months after the anniversary of the date of issuance of the LOA. The HSTT annual Training Exercise Report and Testing Activity reports can be consolidated with other exercise reports from other range complexes in the Pacific Ocean for a single Pacific Exercise Report, if desired. The annual reports shall contain information on MTEs, Sinking Exercise (SINKEX) events, and a summary of all sound sources used, as described in paragraph (e)(3) of this section. The analysis in the detailed reports shall be based on the accumulation of data from the current year's report and data collected from previous reports. The detailed reports shall contain information identified in paragraphs (e)(1) through (5) of this section.

(1) MTEs—This section shall contain the following information for MTEs conducted in the HSTT Study Area.

(i) Exercise Information (for each MTE):

(A) Exercise designator;

(B) Date that exercise began and ended;

(C) Location;

(D) Number and types of active sonar sources used in the exercise;

(E) Number and types of passive acoustic sources used in exercise;

(F) Number and types of vessels, aircraft, etc., participating in exercise;

(G) Total hours of observation by lookouts;

(H) Total hours of all active sonar source operation;

(I) Total hours of each active sonar source bin; and

(J) Wave height (high, low, and average during exercise).

(ii) Individual marine mammal sighting information for each sighting in each exercise when mitigation occurred:

(A) Date/Time/Location of sighting;

(B) Species (if not possible, indication of whale/dolphin/pinniped);

(C) Number of individuals;

(D) Initial Detection Sensor;

(E) Indication of specific type of platform observation made from (including, for example, what type of surface vessel or testing platform);

(F) Length of time observers maintained visual contact with marine mammal;

(G) Sea state;

(H) Visibility;

(I) Sound source in use at the time of sighting;

(J) Indication of whether animal is <200 yd, 200 to 500 yd, 500 to 1,000 yd, 1,000 to 2,000 yd, or >2,000 yd from sonar source;

(K) Mitigation implementation. Whether operation of sonar sensor was delayed, or sonar was powered or shut down, and how long the delay was;

(L) If source in use is hull-mounted, true bearing of animal from ship, true direction of ship's travel, and estimation of animal's motion relative to ship (opening, closing, parallel); and

(M) Observed behavior. Lookouts shall report, in plain language and

without trying to categorize in any way, the observed behavior of the animals (such as animal closing to bow ride, paralleling course/speed, floating on surface and not swimming, etc.) and if any calves present. (iii) An evaluation (based on data gathered during all of the MTEs) of the effectiveness of mitigation measures designed to minimize the received level to which marine mammals may be exposed. This evaluation shall identify the specific observations that support any conclusions the Navy reaches about the effectiveness of the mitigation.

(2) SINKEXs. This section shall include the following information for each SINKEX completed that year.

(i) Exercise information (gathered for each SINKEX);

(A) Location;

(B) Date and time exercise began and ended;

(C) Total hours of observation by lookouts before, during, and after exercise;

(D) Total number and types of explosive source bins detonated;

(E) Number and types of passive acoustic sources used in exercise;

(F) Total hours of passive acoustic search time;

(G) Number and types of vessels, aircraft, etc., participating in exercise;

(H) Wave height in feet (high, low, and average during exercise); and

(I) Narrative description of sensors and platforms utilized for marine mammal detection and timeline illustrating how marine mammal detection was conducted.

(ii) Individual marine mammal observation (by Navy lookouts) information (gathered for each marine mammal sighting) for each sighting where mitigation was implemented.

(A) Date/Time/Location of sighting;

(B) Species (if not possible, indicate whale, dolphin, or pinniped);

(C) Number of individuals;

(D) Initial detection sensor;

(E) Length of time observers maintained visual contact with marine mammal;

(F) Sea state;

(G) Visibility;

(H) Whether sighting was before, during, or after detonations/exercise, and how many minutes before or after;

(I) Distance of marine mammal from actual detonations—200 yd, 200 to 500 yd, 500 to 1,000 yd, 1,000 to 2,000 yd, or >2,000 yd (or target spot if not yet detonated);

(J) Observed behavior. Lookouts shall report, in plain language and without trying to categorize in any way, the observed behavior of the animal(s) (such as animal closing to bow ride, paralleling course/speed, floating on surface and not swimming etc.), including speed and direction and if any calves present;

(K) Resulting mitigation implementation. Indicate whether explosive detonations were delayed, ceased, modified, or not modified due to marine mammal presence and for how long; and

(L) If observation occurs while explosives are detonating in the water, indicate munition type in use at time of marine mammal detection.

(3) Summary of sources used. This section shall include the following information summarized from the authorized sound sources used in all training and testing events:

(i) Total annual hours or quantity (per the LOA) of each bin of sonar or other acoustic sources (pile driving and air gun activities);

(ii) Total annual expended/detonated rounds (missiles, bombs, sonobuoys, etc.) for each explosive bin.

(4) Humpback Whale Special Reporting Area (December 15–April 15). The Navy shall report the total hours of operation of surface ship hull-mounted mid-frequency active sonar used in the special reporting area.

(5) HSTT Mitigation Areas. The Navy shall report any use that occurred as specifically described in these areas. Information included in the classified annual reports may be used to inform future adaptive management of activities within the HSTT Study Area.

(6) Geographic information presentation. The reports shall present an annual (and seasonal, where practical) depiction of training and testing events and bin usage (as well as pile driving activities) geographically across the HSTT Study Area.

§ 218.76 Letters of Authorization.

(a) To incidentally take marine mammals pursuant to these regulations in this subpart, the Navy must apply for and obtain Letters of Authorization (LOAs) in accordance with § 216.106 of this subpart, conducting the activity identified in § 218.70(c).

(b) LOAs, unless suspended or revoked, may be effective for a period of time not to exceed the expiration date of these regulations in this subpart.

(c) If an LOA(s) expires prior to the expiration date of these regulations in this subpart, the Navy may apply for and obtain a renewal of the LOA(s).

(d) In the event of projected changes to the activity or to mitigation, monitoring, reporting (excluding changes made pursuant to the adaptive management provision of § 218.77(c)(1)) required by an LOA, the Navy must apply for and obtain a modification of LOAs as described in § 218.77.

(e) Each LOA shall set forth:

(1) Permissible methods of incidental taking;

(2) Authorized geographic areas for incidental taking;

(3) Means of effecting the least practicable adverse impact (*i.e.*, mitigation) on the species of marine mammals, their habitat, and the availability of the species for subsistence uses; and

(4) Requirements for monitoring and reporting.

(f) Issuance of the LOA(s) shall be based on a determination that the level of taking shall be consistent with the findings made for the total taking allowable under these regulations in this subpart.

(g) Notice of issuance or denial of the LOA(s) shall be published in the **Federal Register** within 30 days of a determination.

§ 218.77 Renewals and modifications of Letters of Authorization.

(a) An LOA issued under § 216.106 of this subchapter and § 218.76 for the activity identified in § 218.70(c) shall be renewed or modified upon request by the applicant, provided that:

(1) The proposed specified activity and mitigation, monitoring, and reporting measures, as well as the anticipated impacts, are the same as those described and analyzed for these regulations in this subpart (excluding changes made pursuant to the adaptive management provision in paragraph (c)(1) of this section); and

(2) NMFS determines that the mitigation, monitoring, and reporting measures required by the previous LOA(s) under these regulations in this subpart were implemented.

(b) For LOA modification or renewal requests by the applicant that include changes to the activity or the mitigation, monitoring, or reporting measures (excluding changes made pursuant to the adaptive management provision in paragraph (c)(1) of this section) that do not change the findings made for the regulations or result in no more than a minor change in the total estimated number of takes (or distribution by species or years), NMFS may publish a notice of proposed LOA in the **Federal Register**, including the associated analysis of the change, and solicit public comment before issuing the LOA.

(c) An LOA issued under § 216.106 of this subchapter and § 218.76 for the activity identified in § 218.70(c) may be modified by NMFS under the following circumstances:

(1) Adaptive Management—After consulting with the Navy regarding the

practicability of the modifications, NMFS may modify (including adding or removing measures) the existing mitigation, monitoring, or reporting measures if doing so creates a reasonable likelihood of more effectively accomplishing the goals of the mitigation and monitoring set forth in this subpart.

(i) Possible sources of data that could contribute to the decision to modify the mitigation, monitoring, or reporting measures in an LOA:

(A) Results from the Navy's monitoring from the previous year(s);

(B) Results from other marine mammal and/or sound research or studies; or

(C) Any information that reveals marine mammals may have been taken in a manner, extent or number not authorized by these regulations in this subpart or subsequent LOAs.

(ii) If, through adaptive management, the modifications to the mitigation, monitoring, or reporting measures are substantial, NMFS shall publish a notice of proposed LOA in the **Federal Register** and solicit public comment.

(2) Emergencies—If NMFS determines that an emergency exists that poses a significant risk to the well-being of the species or stocks of marine mammals specified in LOAs issued pursuant to § 216.106 of this chapter and § 217.86, an LOA may be modified without prior notice or opportunity for public comment. Notice would be published in the **Federal Register** within thirty days of the action.

§§ 218.78–218.79 [Reserved]

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Appendix H: Public Comment Responses

Final
Environmental Impact Statement/Overseas Environmental Impact Statement
Hawaii-Southern California Training and Testing

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APPENDIX H PUBLIC COMMENT RESPONSES

This appendix includes information about the public's participation in the development of the Hawaii-Southern California Training and Testing (HSTT) Environmental Impact Statement/Overseas Environmental Impact Statement (EIS/OEIS).

H.1 INTRODUCTION

The Navy would like to thank the elected officials, Native American tribes, federal regulatory and state resource agencies, business and community leaders, organizations, and individuals for taking the time to review the Draft HSTT EIS/OEIS, attend the public meetings, and submit comments on the document. Public informational meetings and public participation are an essential aspect of the environmental review process. This appendix contains a summary of the comments received on the HSTT Draft EIS/OEIS and the Navy's responses.

H.2 PUBLIC COMMENT PERIOD FOR THE DRAFT ENVIRONMENTAL/OVERSEAS ENVIRONMENTAL IMPACT STATEMENT

The public comment period on the Draft HSTT EIS/OEIS began with the issuance of the Notice of Availability and a Notice of Public Meetings in the *Federal Register* on October 13, 2017. A Notice of Availability was published in the *Federal Register* on October 17, 2017 (Appendix G, Federal Register Notices). The public comment period began on October 13, 2017 and concluded on December 12, 2017. The Navy made significant efforts to notify the public to ensure maximum participation during the public comment period using signed letters, post cards, press releases and newspaper daily advertisements (Chapter 8, Public Involvement and Distribution).

The Notice of Public Meetings included a project description and dates and locations of the five public meetings. The public comment period allowed a variety of opportunities for the public to comment on the Draft EIS/OEIS (Appendix G, Federal Register Notices). Copies of the Draft EIS/OEIS were provided to eight libraries in Hawaii and Southern California. The Draft EIS/OEIS was also available on the project website for review. Navy representatives were available during the open house public meetings to provide information and answer questions. Comment sheets and a voice recorder were available to attendees. Commenters provided their input on the Draft EIS/OEIS in letters submitted through mail, written comments received at the public meetings, and via the project website.

H.2.1 COMMENTERS, COMMENTS AND RESPONSES

This section contains a list of the agencies (Table H-1) and private entities (Table H-2) that commented on the Draft EIS/OEIS and a comment matrix with Navy responses associated with the comments received (Table H-3). Scanned copies of comment letters (with the Commenter Identification Number assigned) and a spreadsheet compiling and numbering all of the individual concerns within each letter are available on the project website (https://hstteis.com/).

H.2.1.1 Comment Response Process

The Navy considered and responded to all comments received on the Draft EIS/OEIS, as detailed in this Final EIS/OEIS. The Navy's responses to comments received during the public comment period are included in this Appendix. In accordance with 40 Code of Federal Regulations (CFR) 1503.4, comments were assessed and responded to as follows:

- The Navy project team carefully reviewed all comments received. Each comment was assigned to a resource-specific specialist from the Navy's interdisciplinary team.

- Within each comment submittal, substantive comments were identified for consideration of possible updates to the EIS/OEIS analysis. Generally, substantive comments included items such as questions related to the alternatives analysis and components of the Proposed Action; resource-specific methodology, analysis, or impact conclusions; or the use, adequacy, or accuracy of data used to support the analysis. See Section H.2.1.3 (Agency and Organization Comment Coding) for more details about the criteria for substantive comments.
- The EIS/OEIS analysis was updated as warranted based on comment review.
- Comment responses were developed for every comment based on the above-described comment review and EIS/OEIS update process. Responses identify, as appropriate, sections of the EIS/OEIS where revisions were made or details on where additional information is provided within the EIS/OEIS.

H.2.1.2 Agency, Organization and Private Individual Comment Coding

Comments were received from 5 federal agencies, 7 state/local government agencies, 20 non-governmental organizations, 1 tribal government, 1 form letter (received from approximately 1,850 commenters), and approximately 343 private individuals.

H.2.1.3 Agency and Organization Comment Coding

Table H-1 lists the agencies and organizations that submitted comments during the comment period. This table lists each comment by the Comment Identification Number and where in the Comment Response Matrix (Table H-3) their comment and response can be found, using a comment reference number. For example, a comment letter from a federal agency could contain 10 comments. To organize responses, each commenter received a Comment Identification Number and each comment within the letter was numbered (e.g., F01-01 is the first comment in the letter from the U.S Department of the Interior). A list of all of the Commenter Identification Numbers assigned and the corresponding comments can be found on the project website (https://hstteis.com/).

Table H-1: Agencies and Organizations Who Commented on the Draft Environmental Impact Statement/Overseas Environmental Impact Statement

Commenter ID	*Commenting Agency/Organization*	*Table H-3 Comment Reference Number*
Federal Agencies (F)		
F01	U.S. Department of the Interior	128, 129, 130
F02	Marine Mammal Commission	30, 31, 32, 46, 47, 141, 142–148, 153–158
F03	International Boundary and Water Commission, United States Section	1
F04	U.S. Environmental Protection Agency	1

Table H-1: Agencies and Organizations Who Commented on the Draft Environmental Impact Statement/Overseas Environmental Impact Statement (continued)

Commenter ID	*Commenting Agency/Organization*	*Table H-3 Comment Reference Number*
State/Local Agencies (S)		
S01	California Coastal Commission	33, 114, 116
S02	Hawaii Department of Health, Clean Water Branch	1, 118, 133, 134
S03	Hawaii Department of Transportation	181
S04	Maui Department of Planning	119
S05	Office of the Governor, State of Hawaii	1, 20–25, 41–43, 110–113
S06	Hawaii County Council Representative of Puna, District 5	2, 44, 131
S07	Hawaii Department of Defense	1
S08	State of Hawaii Office of Planning	1, 2, 44, 114, 131, 132
S09	California Senator (Toni Atkins)	28
Organizations (O)		
O01	Cascadia Research Collective	34, 37, 48-50
O02	Earthjustice	8-14, 38, 39, 51–54, 120, 124, 125, 171–173
O03	Northwest Hawaiian Islands Coral Reef Ecosystem Reserve Advisory Council	132, 149, 166, 174
O04[1]	Natural Resources Defense Council (NRDC)	15, 34, 35, 55–101, 122, 135, 137, 138, 161–165
O05	Hawaiian Islands Humpback Whale National Marine Sanctuary Advisory Council	16, 17, 102, 123, 132, 150, 160, 166, 175, 180
O06	Sierra Club of Hawaii	5, 8, 121
O07	Citizens Opposing Active Sonar Threats (COAST)	4, 18, 19, 40, 103–106, 131, 136, 139, 140, 167
O08	Malu-Aina	4
O09	Kai Palaoa	1, 136, 152, 176, 177
O10	Environmental Caucus of The Democratic Party of Hawaii	6
O11	Temple of the Spirit	6
O12	Family Gilroy	4
O13	Hale O Lono	4
O14	Rally for Common Good	4
O15	Surfrider Foundation, Kauai Chapter	7, 107, 149, 178, 179
O16	Kohola Leo (Whale Voice)	44, 149
O17	Na Kiai a Kanaloa	4
O18	Auwana Hawaii LLC	6, 131
O19	Kulike Farm	4
O20	Reef Guardians Hawaii	4
Native American Tribes (N)		
N01	Viejas Band of Kumeyaay Indians	115

[1]The NRDC submitted comments on behalf of the following organizations: OceanCare and Cetacean Society International.

H.2.1.4 Private Citizen Comment Coding

In order to keep personally identifiable information private and to allow commenters to find their comments in this appendix, the Navy assigned each comment a code based on components of the commenter's name. Personally identifiable information includes an individual's name, physical address, email address, or place of employment. Table H-2 lists the Commenter Identification Number for private individuals who submitted comments during the comment period. This table lists each comment by Commenter Identification Number and where in the Comment Response Matrix (Table H-3) their comment and response can be found, using a comment reference number. Individuals who commented on the Draft EIS/OEIS during the public comment period may find their comments using the following method:

- Each individual commenter was assigned a five-digit code (AAABB) that corresponds with their first and last name. "AAA" is the first three letters of the commenter's last name; "BB" is the first two letters of their first name. If more than one person has the same code, then a number was added to the end of the five-digit code to designate multiple commenters (AAABB1 and AAABB2). If the commenter submitted multiple comments within a letter, then a sequential number was assigned to each comment in the letter beginning with 01 and increases with each comment received from that individual. For example, the first comment received from an individual named John Doe would have the comment code DOEJO-01.
- Special cases:
    - For instances where limited information was provided, a lower case "x" is used in place of letters or numbers. Examples include instances in which only a last name was provided, such as "Doe," and the resulting comment code would be DOExx. Similarly, if only the first name "John" was provided, the comment code would be xxxJO. If a first or last name was too short to fill in the code (i.e., three letters for the last name or two letters for the first name), a lower case "x" is also used. For example, if the commenter is J Doe, the comment code would be DOEJx.
    - When a comment was submitted with no name or the commenter wrote "anonymous," the comment is coded ANONY and the single-digit numbers increase sequentially. For example, if multiple individuals submitted comments without providing a name then the comment codes would be ANONY1, ANONY2, and ANONY3.

H.3 Comment Responses

Responses to all comments received on the Draft EIS/OEIS are included in this section. Comment responses are organized by topic category. Table H-2 provides private individual commenters the location in Table H-3 where their comments are addressed. Many of the comments received during the Draft EIS/OEIS public comment period can be grouped into larger categories. In these instances, the comments are summarized and a response is provided for the entire category. A copy of all of the comments received during the Draft EIS/OEIS public comment period is provided on the project website (https://hstteis.com/). Some comments require a more detailed response. In these cases, the entire comment is provided in Table H-3 with a response specific to that comment.

Table H-2 Private Individual Comment Response Index

Commenter Identification Number[1]	*Table H-3 Comment Reference Number*
ABAMD	1
ABEOL	5
ACUJA	6
AFARA	2
ALBJI	4
ALBTO	4
ALORU	4
ALSLI	4
AMOKE	4
ANDDE	6
ANDLY	6
ANONY1	114
ANONY2	6
ANONY3	4
ANONY4	4
ANONY5	2
ANONY6	5
ARARA	6
ASHHA	4
BAIST	5
BAJCL	4
BALCO	5
BARDU	4
BARKA	4, 5
BARLO	6
BARMA	4
BASMA	6
BATBO	6
BELCH	4
BENKA	152
BERCH	4
BERRI	4
BIEJO	6
BLAKA	6
BLAMA	4
BLAPA	4
BLAST	4
BOLPA	4
BORKR	4
BREKI	6
BRIJU	4
BROPU	4
BRUSH	4
BUCME	6
BUCTO	4
BURST	3
CARSH	4
CARTA	4
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CAVRA	29
CHENI	26
CHRPE	6
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COLAR	6
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JENSE	4
JOHLO	4
JUARO	4
JxxLx	6
KALLE	26
KAPHA	4
KAUKA	6
KAULA	4
KAYTI	6
KEAKA	3
KEAPO	4
KEEPH	4
KELJO	4
KELTA	4
KENMA	26
KILEL	6
KIMCA	6
KINCH	6
KINTH	4

Commenter Identification Number[1]	*Table H-3 Comment Reference Number*
KLEER	4
KLITH	4
KLIZA	4
KOHLO	4
KOTAR	4
KOTJO	4
KROLI	4, 6
KUYPA	6
LADAx	4
LADTE	6
LALEL	4
LALRO	4
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OBYPA	6
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OLSAM	6
OLSVI	6
OMESU	6
PACPA	4
PAIKO	4
PARDA	4
PASRI	4
PASSI	4
PASWA	4
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PETRI	4
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PROAN	6
QUAJE	4
QUITE	4
RADHE	4
RAMET	4
RAYWE	6
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RICCA	6
RICRO	6
RILJE	4
ROBLE	6
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STOKE	6
STOME	4
STOSH	4
STOWA	4
STRSU	4
STRSx	2, 126
STUTI	4
SUMQU	1
SYDRE	1, 6
TAKAN	6
TAYKE	4
TELJE	6
TILDA	4
TOBAL	6
TOMRU	6
TOOKA	6
TORJA	4
TRALA	4
TRIRO	4
TURJE	4
VANEL	4
VASIR	4
VILGA	4
WAIMA	152
WALDE	26
WALMI	6
WARDA	6
WARLA	4
WEIMA	6
WEIVA	6
WELBA	4
WERAN	4
WICCA	6
WILCI	4
WILSH	6
WOOMA	6
WSWALI	6
xxxNI	4
YAMRO	6
YOOTE	6
YUEKx	3
ZACAL	4

[1]See Section H.2.1.4, Private Citizen Comment Coding, for an explanation of the commenter identification numbers methodology.

Table H-3: Comment Response Matrix

Reference Number	*Total Comments*	*Comment*	*Response*
Generic Comments			
1	Federal: F03 F04 State: S02 S05 S07 S08 Organization: O09-01 Individuals: ABAMD STESH-01 SUMQU SYDRE-01	20 comments introducing, or thanking the Navy for the opportunity to comment were received.	Thank you for your review.
Out of Scope			
2	State: S06-03 S08-05 Individuals: AFARA ANONY5 DAVVI STRSx-01	6 comments on topics that are outside of the scope of the EIS/OEIS were received.	Thank you for your participation in the National Environmental Policy Act process. The Proposed Action does not include the topic of your comment. Please see Chapter 2 (Description of Proposed Action and Alternatives) of the EIS/OEIS for a definition of the scope of the project.

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
Support of the Navy/Proposed Action			
3	Individuals: BURST CULJO KEAKA LAWTH ODAMI PERMA SHABE-01 YUEKx	The Navy received 10 comments that expressed support for the Navy and/or the Proposed Action.	Thank you for your participation in the National Environmental Policy Act process. Your comment is part of the official project record.
Against Navy/Proposed Action			
4	Organization: O07-14 O08 O12 O13 O14 O17 O19 O20 Individuals: ALBJI-01 ALBJI-02 ALBJI-03 ALBTO ALORU ALSLI AMOKE ANONY3 ANONY4 ASHHA BAJCL BARDU	184 comments expressed opposition to the Navy and/or the Proposed Action.	Thank you for your participation in the National Environmental Policy Act process. Your comment is part of the official project record. The proposed training and testing activities are generally consistent with training and testing that the Navy has been conducting in the HSTT Study Area for decades.

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
	BARKA-01 BARMA BELCH BERCH BERRI BLAMA BLAPA BLAST BOLPA BORKR BRIJU BROPU BRUSH BUCTO CARSH CARTA CASLE-01 CASLE-02 COWFE CRUTR CUCJU-04 CUMMI-01 CUMMI-02 DANLA DELEA EPPKA-01 FADDE FERJO FITAN FOSJU FUGRO FUJRO GASNO-01		

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
	GIADE GOMBE GRADO GRICA GUYCH HAMSA HARGA-01 HARGA-02 HARWK HEGAL HENAD HENMA HOEJU HOHMA HoxJE HOxNE-01 HOxNE-02 JARJU JENSE JOHLO JUARO KAPHA KAULA KEAPO KEEPH KELJO KELTA KINTH KLEER KLITH KLIZA KOHLO KOTAR		

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
	KOTJO KROLI-01 LADAx LALEL LALRO-01 LALRO-02 LANJO LARHA LARLE LEEMA LIMGI LINKA LITSY LixDA LOMHE LOPCL LOPKE LOSJE-01 LOSJE-02 LYLNA MAHxx MARDA MARMA MATJA MATSH MCAME MCCCH MCDRO MCNLY MIKLE MILDI MILJO MITJE		

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
	MITME		
	MORJE		
	MOTPU-01		
	MULDA		
	MUNNA-01		
	MUNNA-02		
	NEWRA		
	NORDE		
	PACPA		
	PAIKO		
	PARDA		
	PASRI		
	PASSI		
	PASWA		
	PATPA		
	PERLE		
	PETKA		
	PETRI		
	PIPDA		
	PLEJA		
	QUAJE		
	QUITE		
	RADHE		
	RAMET		
	RILJE		
	ROBST		
	ROGNA		
	ROMRO		
	RUDSH		
	SABNA		
	SABSA		
	SADAB		
	SANDA-01		

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
	SANNA SAUHE SCHME SELLA-01 SHAAN SHAGE SHEEL SINLA-01 SINLA-02 SMIMI SOUAU SOUEL STEMI STIJU STOME STOSH STOWA STRSU STUTI TAYKE-01 TAYKE-02 TILDA TORJA TRALA TRIRO TURJE VANEL VASIR VILGA WARLA WELBA WERAN WILCI		

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
	XxxNI ZACAL		
Form Letter			
5	Organization: O06-04 ~1,850 Individuals including: ABEOL ANONY6 BAIST BALCO BARKA-02 Form1	I am deeply concerned about the Navy's proposed training and testing activities in the waters around Hawai'i and off Southern California. The Navy's own analysis reveals its activities would inflict harm on whales, dolphins and other marine mammals over 12 million times during the next five years, subjecting these sensitive animals to a barrage of sonar blasts and explosions. More than 3,000 whales and dolphins would suffer permanent loss of hearing, on which they depend for survival. The key to reducing harm to marine mammals is to restrict harmful Navy activities in sensitive marine habitat. Unfortunately, in the draft EIS, the Navy proposes to strip protections from critical areas like the 'Alenuihāhā Channel between Maui and Hawai'i Island, where restrictions have been in place since 2015 under a settlement agreement the Navy voluntarily reached with Earthjustice. That the Navy has been able to perform its mission for over two years under these restrictions demonstrates that continued implementation of all of the protections from the 2015 settlement is a reasonable alternative the Navy must examine. The Navy also should examine other alternatives that would limit harmful activities in important marine mammal habitat around O'ahu and Kaua'i, including areas recently proposed as critical habitat for the endangered Insular False Killer Whale, whose population may now be fewer than 100 individuals.	It is inaccurate to state that Navy training and testing activities would result in more than 12 million instances of harm to marine mammal species. The Navy concludes that training and testing activities proposed in the Study Area would result in Level B and Level A takes, as summarized in Section 5.1 (Incidental Take Request from Acoustic and Explosive Sources) and Section 5.2 (Incidental Take Request from Vessel Strikes) of the Request for Regulations and Letter of Authorization submitted to NMFS (LOA Application). However, the estimated number of takes, although large, is conservative, and more importantly, does not equate to long-term population-level impact to affected species. The Navy proposes to continue protections in the Alenuihaha Channel (see discussion of the Hawaii Island Mitigation Area in Section K.2.2.4.2 of Appendix K). Based on best available science, the Navy concludes that exposures of marine mammal species and stocks associated with proposed training and testing activities would result in only short-term effects on most individual animals exposed and would not affect annual rates of recruitment or survival for the following reasons: • Most acoustic and explosive exposures are within the non-injurious temporary threshold shift or behavioral effects zones (Level B harassment). • Although the numbers presented in Section 6.6 of the

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
			LOA Application represent estimated harassment under the MMPA, they are conservative estimates (i.e., over predictions) of harassment, primarily by behavioral disturbance. • The mitigation measures are designed to avoid or reduce the potential for injury from acoustic, explosive, and physical disturbance stressors to the maximum extent practicable. • Range complexes where intensive training and testing have been occurring for decades have populations of multiple species with strong site fidelity (including resident beaked whales at some locations) and increases in the number of some species. The well-being of marine life and the marine environment is a significant factor in Navy decision making, and in the conduct of testing and training. Utilizing the latest science and technology, the Navy completed extensive analyses and computer-based modeling to determine impacts and develop science-based protective measures to reduce or avoid potential impacts to marine life. All of the potential environmental effects from Navy training and testing activities were analyzed in Chapter 3 (Affected Environment and Environmental Consequences) of the EIS/OEIS. Also, as described in Chapter 5 (Mitigation) of the EIS/OEIS, the Navy implements to the maximum extent practicable, procedural, geographic, and temporal mitigation measures during its training and testing activities to reduce potential impacts to marine life. This scientific-based analysis indicates that with utilization of the Navy's protective mitigations, there is not a significant impact on marine species (see Appendix K [Geographic Mitigation Assessment] for details on geographic

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
			mitigation and area restrictions). Specifically, see Table K.2-2 in Appendix K that shows the changes in mitigation areas from 2015 (Phase II) to the new proposed areas (Phase III).
Potential impact to marine life			
6	Organization: O10-01 O10-02 O11 O18-01 Individuals: ACUJA ANDDE ANDLY ANONY2 ARARA BARLO BASMA BATBO BIEJO BLAKA BREKI BUCME CHRPE CHRRY COLAR COLJA DAYPA-02 DYACY EPPKA-02 FONMA FOXKO FOXMA	120 comments expressed concern for marine life.	The Navy is also concerned for marine life. Utilizing the latest science and technology, the Navy completed extensive analyses and computer-based modeling to determine impacts and develop science-based protective measures to reduce or avoid potential impacts to marine life. All of the potential effects from Navy training and testing activities were analyzed in Chapter 3 (Affected Environment and Environmental Consequences) of the EIS/OEIS. Also, as described in Chapter 5 (Mitigation) of the EIS/OEIS, the Navy implements to the maximum extent practicable, procedural, geographic, and temporal mitigation measures during its training and testing activities to reduce potential impacts to marine life. This scientific-based analysis indicates that with utilization of the Navy's protective mitigations, there is not a significant impact on marine species (see Appendix K [Geographic Mitigation Assessment] for detail on geographic mitigation and area restrictions).

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
	FUCMA FUJRI GANMI GOGBE GOOLL GUTMA HALLI HARCA HARCO-04 HECAN HOLWI-02 HOWSA HRDBR HRDLA HxxST HYSMI JxxLx KAUKA KAYTI KILEL KIMCA KINCH KROLI-02 KUYPA LADTE LAMJO LARST LEEKA LESDO-02 LEVNA-01 LILTE-01 LOWIN LUIMA		

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
	MADTO MALLO MANMA MARDA MAYAN MCKNE MCMxx MELCx MONNI-01 MONNI-06 MONNI-07 MONNI-11 MONNI-12 MONNI-13 MONNI-14 MOOSH MORMI MOTPU-03 MUSKA MUZKA NORLI OBYPA OLSAM OLSVI OMESU PENRI PHETY POLSH POSDE PREMI PROAN RAYWE RENLI		

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
	RICCA RICRO ROBLE SALJA SANYD SELCI SELLA-02 SIMDO SONRE SPAKE STERO-04 STOKE SYDRE-02 TAKAN TELJE TOBAL TOMRU TOOKA WALMI WARDA WEIMA WEIVA WICCA WILSH WOOMA WSWALI YAMRO YOOTE		
7	Individuals: LILTE-02 O15-03	The Navy is developing an underwater drone squadron and using plasma energy, microwaves, lasers, high voltage electronics and other forms of electromagnetic energy underwater along the Kauai, Niihau and Lehua coastlines. I have	The proposed action does not include the use or testing of plasma energy. The Navy's proposed training and testing activities are listed in Chapter 2 (Description of Proposed Action and Alternatives) of the Draft EIS/OEIS (Tables 2.6-1 through 2.6-5). Included in these activities

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
		documented these activities killing our coral reefs especially down near PMRF at Nualolo, Milolii and Salt Pond. What about drones? What about new torpedo technology? What about cyber warfare? What about weapons from space? Lasers?	are individual unmanned vehicles (drones) and laser testing. Some in-air communication equipment used during Navy activities may operate within the microwave spectrum. A complete description of each of the listed activities can be found in Appendix A (Navy Activity Descriptions). The Navy's analysis was completed using the best available, peer-reviewed science. The Navy continues to pursue new scientific data, collected through professional studies and verified through credible, recognized sources. The Navy works proactively with the National Oceanic and Atmospheric Administration, and state, federal, and non-profit environmental organizations to ensure its operations are safe and minimize impact to marine life. There has been no evidence to indicate a correlation between electromagnetic emissions and coral reef disease. The Navy is only one of many sources of electromagnetic emissions, a term that covers a wide range of electrical signals including cell phones, Wi-Fi, commercial broadcast, and communications transmissions. The Navy's sea-based activities take place on designated water ranges away from the North Shore of Kauai where these outbreaks of disease are unfortunately occurring. Any Navy vessels observed off the North Shore of Kauai are transiting through, and there are no "exercises" involving any explosives, sonar, or other equipment during these transits. The Na Pali coast provides complete terrain masking (i.e., utilizing the natural physical environmental features to shield or avoid detection) of Kauai's North Shore during operations at the Pacific Missile Range Facility now as it has for the last 56 years.

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
8	Organization: O02-05 O02-06 O02-08 O06-01 O06-02 Individuals: HARCO-03	Organization O02 made the following comment: "Despite this two-year track record of success in reducing harmful activities in sensitive marine mammal habitats, the DEIS's proposed mitigation measures would strip protections entirely from vital habitats and would substantially reduce protections in other areas protected under the 2015 Settlement," and "The Navy's proposed mitigation also would remove critical protections from sensitive marine mammal habitat off Southern California. Under the 2015 Settlement, the endangered blue whale's seasonal feeding area in the San Diego Arc (2015 Settlement, Areas 3-A and 3-B) benefits from prohibitions on the use of sonar for training and testing activities during both Major Training Exercises and unit-level training. Id. At K-8. Now, the Navy seeks to blast the whales with sonar during three Major Training Exercises per season" and "Given the Navy has been able to perform its mission for more than two years under the time/area restrictions required under the 2015 Settlement, the Navy cannot seriously contend that maintaining those restrictions going forward would not be within the range of reasonable alternatives." Organization O06 commented that the Navy should "uphold the voluntary agreements set forth by the 2015 Earthjustice settlement," and states that the Navy "does not provide explanation as to why it cannot uphold the restrictions in the 2015 settlement concurrent to achieving its mission for military preparedness." An individual made a similar comment: "It is unacceptable that this EIS wipes out protections for marine mammals that were only won by years of litigation-especially when those protections were only in place a few years."	Following the publication of the 2013 Hawaii-Southern California Final EIS/OEIS, a 2015 HSTT-related settlement agreement prohibited or restricted Navy activities within specific areas in the HSTT Study Area. Under the terms of the settlement agreement executed by the parties in September 2015, the Navy agreed to prohibit or restrict the use of certain hull-mounted active sonar and in-water explosives within defined areas until the current authorizations under MMPA and ESA expire on December 24, 2018. While certain time and area restrictions were agreed to in the HSTT settlement, these measures were not selected based on scientific or operational analyses, but instead were agreed to as temporary measures to settle the pending lawsuit. As such, the settlement and its terms were never intended to be a framework for how the Navy develops or implements future mitigation. More importantly, unlike the settlement agreement, the EIS/OEIS, consistent with the mandates of NEPA, contains a thorough discussion, using the best available science, of the underlying biological and scientific factors associated with possible mitigation for species within potential geographic areas. Specifically, in Appendix K (Geographic Mitigation Assessment), the Navy used scientific data on vulnerable or sensitive species such as beaked whales and main Hawaiian Islands insular false killer whales to derive the geographic mitigation areas in the Draft EIS/OEIS. This analysis is then compared against the operational needs of the Navy for its training and testing activities to develop mitigation procedures and areas, which have the least practicable adverse impact on marine mammals and allow the Navy to meet its training and testing requirements.

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
9	Organization: O02-15	The DEIS baldly asserts that, "Although potential impacts on certain marine mammal species from training and testing activities under Alternative 1 may include injury to individuals, those injuries are not expected to lead to long-term consequences for populations." The DEIS similarly claims that "Impacts of all stressors for training and testing activities under Alternative 2 are not expected to have deleterious impacts or long-term consequences to populations of marine mammals."	The Navy concludes that training and testing activities proposed in the Study Area would result in Level B and Level A takes, as summarized in Section 5.1 (Incidental Take Request from Acoustic and Explosive Sources) and Section 5.2 (Incidental Take Request from Vessel Strikes) of the Request for Regulations and Letter of Authorization submitted to NMFS (LOA Application). However, the estimated number of takes, although large, is conservative, and more importantly, does not equate to long-term population-level impact to affected species. Based on best available science, the Navy concludes that exposures of marine mammal species and stocks associated with proposed training and testing activities would result in only short-term effects on most individual animals exposed and would not affect annual rates of recruitment or survival for the following reasons: • Most acoustic and explosive exposures are within the non-injurious temporary threshold shift or behavioral effects zones (Level B harassment). • Although the numbers presented in Section 6.6 of the LOA Application represent estimated harassment under the MMPA, they are conservative estimates (i.e., over predictions) of harassment, primarily by behavioral disturbance. • The mitigation measures are designed to avoid or reduce the potential for injury from acoustic, explosive, and physical disturbance stressors to the maximum extent practicable. • Range complexes where intensive training and testing have been occurring for decades have populations of multiple species with strong site fidelity (including

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
			resident beaked whales at some locations) and increases in the number of some species.
10	Organization: O02-16	By no stretch of the imagination does the DEIS justify these claims. The mere fact that most of the more than 12 million instances of harm to marine mammals involves disruption of marine mammals' essential behavioral patterns does not mean that long-term harm to populations will be avoided. As NMFS explained the last time it authorized incidental take for Navy operations in Hawaii and Southern California, "there are known avenues through which behavioral disturbance of individuals can result in population-level effects."	The estimated number of takes, although large, is conservative (over predictions), are mostly within the non-injurious temporary threshold shift or behavioral effects zones, and more importantly, do not equate to long-term population-level impact to affected species. The Navy has archived over a decade of marine mammal recordings from PMRF hydrophones and is in the process of analyzing that data set to investigate long-term trends. However, given that humpback whale populations have rebounded to the point of being delisted from the Endangered Species Act (ESA) in Hawaii, any effect to population would be expected to be limited and species specific. NMFS's explanation in the *Federal Register* should be examined in its entirety. In full it states "Level B (behavioral) harassment occurs at the level of the individual(s) and does not assume any resulting population-level consequences, though there are known avenues through which behavioral disturbance of individuals can result in population-level effects." 78 Fed. Reg. 78106, 78146 (Dec. 24, 2013). That section concludes by stating "NMFS has determined that the Navy's training and testing activities will have a negligible impact on the marine mammal species and stocks present in the Study Area." Negligible impact is defined as results from the specified activity that cannot be reasonably expected to adversely affect the species or stock through effects on annual rates of recruitment or survival. 50 CFR 216.103. NMFS could not conclude that the Navy training and testing activities would have a negligible impact on the marine mammal species and

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
			stocks present if it found there were population-level effects on the species. Consistent with NMFS' finding in 2013, for reasons noted in Section 3.7 (Marine Mammals), the EIS/OEIS likewise concludes that proposed training and testing activities will not have long-term population-level impacts.
11	Organization: O02-17	Recent, peer-reviewed scientific publications similarly warn that sub-lethal effects associated with navy sonar "may have a greater impact than direct physical injury" by forcing marine mammals to leave biologically important habitat or by masking sounds associated with communication, predator detection, or navigation. Forney et al. (2017). Displacement from biologically important habitat can be "a source of significant harm (including injury or death), particularly for small, resident populations" – like the Kohala resident population of melon-headed whales and other small, resident populations around the Hawaiian Islands – "that may have 'nowhere to go' and for which the costs of leaving their habitat may be severe." The DEIS provides no analysis of this critical information.	The Navy has thoroughly analyzed Forney et al. (2017), the areas identified by Baird, Calambokidis, and LaBreque, and the masking of biologically important sounds in the Marine Mammals chapter of the EIS/OEIS (see Section 3.7 [Marine Mammals]). The Navy does not agree with the characterization of these animals as having "nowhere to go." Nonetheless the Navy has created mitigation areas that are analyzed in Appendix K (Geographic Mitigation Assessment). For example, the Navy's estimated impacts to the Kohala resident stock do not take into consideration that the Navy has developed mitigation areas, one of which (the Hawaii Island Mitigation Area) overlaps the small and resident population area of the Kohala resident stock of melon-headed whales identified by Baird et al. (2015). These mitigation areas are likely to result in an avoidance or reduction of impacts from active sonar and explosives on several species of marine mammals within these areas, including the Kohala resident stock of melon-headed whales.
12	Organization: O02-18	The Navy must perform a detailed analysis of the potential population-level effects of the proposed HSTT activities for each of the marine mammal species and stocks that would be affected. Among other mandated analyses, the Navy must carefully assess the impacts of proposed HSTT activities on the critically endangered Main Hawaiian Islands Insular stock of false killer whales.	The EIS/OEIS provides a breakdown for each of the species, stocks, and locations that will be affected for each stressor. These are provided in the Marine Mammals chapter of the EIS/OEIS (see Section 3.7 [Marine Mammals]) and Appendix K (Geographic Mitigation Assessment). The Navy has assessed the impacts of proposed HSTT activities on the endangered

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
		The DEIS provides no analysis to support its conclusion that continuing to subject this critically endangered stock to military sonar–one of the manmade factors affecting its continued existence–would not cause significant impacts	Main Hawaiian Islands Insular stock of false killer whales in both Section 3.7 of the EIS/OEIS and in Appendix K (Section K.3.3.1.2, Stressor Analysis). NMFS has determined that incidental take (hooking or entanglements) in commercial and recreational fisheries are the highest manmade threats to this species (FR Vol. 83, No. 142, Tuesday, July 24, 2018). Other threats, which NMFS has characterized as "medium-level," include environmental contaminants, competition with fisheries for food, effects from climate change, and acoustic disturbance (from a variety of sound sources) that may also play a role in impeding the species recovery. With regard to military sonar, the EIS/OEIS describes scientific findings demonstrating the lack of avoidance observed by a false killer whale in the Pacific Missile Range Facility underwater tracking range. The tagged animal was tracked passing through the range during a training event involving mid-frequency active sonar, with estimated received levels up to 188 dB re 1 microPascal. Despite this exposure, the animal remained in the vicinity for two more days, and passed through the training event again, continuing to be exposed to mid-frequency active sonar. This animal's lack of observable behavioral response to mid-frequency active sonar is consistent with bottlenose dolphins, rough-toothed dolphins, and pilot whales for which analysis of this kind has also been conducted from Pacific Missile Range Facility data. In addition to the analysis in the EIS/OEIS, an analysis of the Main Hawaiian Islands stock of false killer whales, as well as the other ESA-listed species, has been provided to NMFS during the Section 7 consultation process. Additionally, despite the data showing a lack of response from the tagged individual,

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
			since this is a small sample size, the Navy has conservatively proposed geographic mitigations for some areas of higher occurrence for insular false killer whales given their ESA status.
13	Organization: O02-19	The revised draft must also take a hard look at the impacts of HSTT activities on the Kohala resident population of melon-headed whales, which are known to be susceptible to high intensity anthropogenic noise, including Navy sonar.	The Navy has taken a hard look at the impacts of HSTT activities on the Kohala resident population. Although the Navy impacts are limited to non-injurious affects, the Navy has proposed a geographic mitigation for an area that overlaps the small and resident population area of the Kohala resident stock of melon-headed whales identified by Baird et al. (2015).The EIS/OEIS states there are no estimated injury or permanent threshold shift (PTS) takes to melon-headed whales from sonar or other Navy activities. The mitigation measures in this new area includes a limit to the amount of surface ship hull-mounted mid-frequency active sonar and dipping sonar during all training and testing year-round. In addition to limits on these sonar hours, the Navy shall not use explosives in the Hawaii Island Mitigation Area that would potentially result in the take of marine mammals during training and testing. These mitigation areas are likely to result in an avoidance or reduction of impacts from active sonar and explosives on several species of marine mammals within these areas, including the Kohala resident stock of melon-headed whales.
14	Organization: O02-21	There's no quantification with respect to the various biological areas that the Navy is not going to restrict these activities. There's no analysis of the quantification of the extent to which that would benefit marine mammals. And we know from the science that particularly areas where the Navy trains rarely, those marine mammals are not accustomed to the sonar, not accustomed to the explosives, so they may actually be more highly affected than animals where there's more routine	The EIS does look at effects down to the species and population level. Since population-level effects are a concern of regulatory agency, the Navy is in further consultation with NMFS to reduce any likely effect to population or stocks.

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
		testing. So there needs to be a greater range of alternatives looking at each of these areas and putting out for the public's review, for expert review, hopefully in a revised draft, in which there are different suites of alternatives that are considered rather than a one size fits all Navy knows best, this is how we're going to do it. Because the EIS needs to consider this range of alternatives. And with respect to that, in 2015, you agreed to certain restrictions in various areas, like the channel between Maui and the Big Island that is critical for many marine mammal species that call Hawaii home. That's been eliminated from the Draft EIS. You've been living under that restriction for the last two years. And so there's no discussion in the draft as to why that's somehow operationally unfeasible, why you can't do it. And so you should look at an alternative that, at a minimum, considers the 2015 restrictions going forward, as well as additional areas.	
15	Organization: O04-02	… The agencies should include information that is essential to evaluate the compliance of the Navy's proposed activities with the MMPA and ESA. Such information includes, but is not limited to: • Species- or stock-specific information supporting findings for each affected marine mammal species or stock, as NMFS may not conclude, under the Marine Mammal Protection Act, that an activity will have only a "negligible impact" on a particular species or stock if it has no information on which to do so, see id. At 1225; • A comparison of levels of incidental mortality to each marine mammal stock's potential biological removal ("PBR") level and an evaluation of potentially non-negligible impacts where incidental mortality exceeds PBR, see id. At 1225-28; • Thorough "analysis of ways to mitigate the negative effects of the Navy's activities on affected species and stocks," id. At	The Navy considered and discussed in the EIS/OEIS all of these factors enumerated by the commenter. For analysis of potential effects to marine mammal species or stocks as required by the MMPA, the Navy presented this analysis by species, population, or stock in sections 3.7.3.1 (Acoustic Stressors) and 3.7.3.2 (Explosive Stressors). Potential biological removal (PBR) is discussed in sections 3.7.3.2 (Explosive Stressors) and 3.7.3.4 (Physical Disturbance and Strike Stressors). A complete analysis of the Navy's mitigation measures is discussed in Chapter 5 (Mitigation). Sea turtles are discussed in section 3.8.3 (Environmental Consequences).

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
		1229, including consideration of time/area restrictions or "measures of equivalent effect," id. At 1231; and • The impact on endangered sea turtles of the levels of take for which the Navy seeks ESA authorization, id. At 1234-35.	
16	Organization: O05-06	• It does not demonstrate that the Navy is consulting with other scientists to include state of the art acoustic research and studies related to Marine Mammals. For example, the effectiveness of sounds that act as a warning for Marine Mammals to self-restrict their hearing levels;	Section 3.0.1.1 (Marine Species Monitoring and Research Programs) and Section 5.1.2.2.1 (Marine Species Research and Monitoring Programs), detail the Navy's consultation with NMFS and other scientists on a routine basis, including scientists from the National Oceanographic and Atmospheric Administration. In addition, the Navy consults with numerous marine mammal experts, organizations, and researchers and uses the best available science in its analysis.
17	Organization: O05-09	The Navy's failure is in stark contrast to both the unprecedented level of harm and the varied activities taking place over such a large area. This letter expresses our concern for all marine mammals found within the Hawaiian Islands Humpback Whale National Marine Sanctuary and the surrounding ocean waters that connect our islands. Regardless of these known harms to marine life, the Navy is projecting a net increase in testing systems that use sonar.	The proposed activities in this EIS/OEIS are the same activities analyzed and approved by the National Oceanic and Atmospheric Administration (NOAA) in the 1997 Hawaiian Islands Humpback Whale National Marine Sanctuary EIS/Management Plan. The Navy is not projecting a net increase in sonar use, but as reflected in Chapter 2 (Description of Proposed Action and Alternatives, Figure 2.5-1 and Figure 2.5-2), the Navy is proposing reduced levels of many sonar sources, including hull-mounted mid-frequency active sonar. The Navy is concerned for marine life and continues to be one of the largest funders of marine species research worldwide. Utilizing the latest science and technology, the Navy completed extensive analyses and computer-based modeling to determine impacts and develop science-based protective measures to reduce or avoid potential impacts to marine life. All of the potential effects from Navy training and testing activities were analyzed in Chapter 3 (Affected Environment and

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
			Environmental Consequences). Also, as described in Chapter 5 (Mitigation), the Navy implements to the maximum extent practicable, procedural, geographic, and temporal mitigation measures during its training and testing activities to reduce potential impacts to marine life. This scientific-based analysis indicates that there will not be a significant impact on marine species.
18	Organization: O07-02 O07-08	In this Draft EIS/OEIS, the Navy makes use of a number of assumptions which are flawed. Some of these assumptions are stated explicitly while others are implied, some more subtly than others. A few of these flawed assumptions are: • America's national security rests on its ability to defend against enemy attack and is unrelated to its ability to sustain healthy marine ecosystems... Purpose and Need The Draft EIS/OEIS states that one of the reasons the Navy carries out training and testing activities is to be able to protect the United States against its enemies. But the Navy continues to fail to recognize another threat to our national security; the degradation and destruction of the environment, upon which all of our lives depend. This lack of recognition is revealed by the manner in which the Draft EIS/OEIS improperly minimizes or denies the very real potential for significant harm to the environment. Yet environmental destruction threatens the security not only of this nation, but of all nations. Indeed, an unbiased look at conflicts around the world will show that some of these are directly related to dwindling resources such as oil, although, as in the current US wars, these conflicts are usually waged under other pretenses. While the Navy prepared this Draft EIS/OEIS because it was required by law to do so, its deficiencies make clear it does not fully comprehend the fact that environmental damage, including the huge amount of damage done by the US Navy, threatens US (and global)	The Navy acknowledges that there are many and varied threats to a nation's security. As the nation's Navy, we are charged with addressing a subset of those threats – specifically, defending the nation from attack. That is what our training and testing is designed to prepare for. In doing this, however, we are not blind to or ignorant of the importance of marine ecosystems. Indeed, we are openly and transparently and rigorously meeting our obligations under various laws to protect marine species and habitats. Therefore, it is inaccurate to state that the Navy's actions are unrelated to environmental protection. The Navy's analysis of potential impacts to the environment is included in Chapter 3 (Affected Environment and Environmental Consequences) of the EIS/OEIS.

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
		security in at least as real a way as do those determined by the US government to be our enemies.	
19	Organization: O07-09	Environmental Consequences There is a tremendous potential for HSTT activities to negatively impact the environment in a number of ways. But it is likely that some of the most widespread, and serious, impacts will come as a result of noise produced by HSTT activities. The marine environment is one that is filled with naturally occurring sound. It is also home to numerous organisms who hear or otherwise sense this sound. Many of these use sound for communication, navigation, detection of predators, and other functions necessary to their survival. Although the Navy attempts to downplay the potential for negative impacts to the creatures who inhabit the marine environment, it is fairly obvious that the potential for this is great, including impacts that may help push species over the edge and into extinction. The Navy may choose to remain in denial about this, but a child understands that in filling ocean areas with noise, sometimes very intense noise, that creatures who inhabit or travel through these waters, or who depend on others that do, will be negatively impacted. You don't need to be a rocket scientist to understand this.	The Navy's activities are actually a small component of the overall sound in the ocean. Also, the Navy's activities are sporadic, with only temporary use of sonar and explosives. The Navy used the best available science to develop its analysis to include the effects of causing anthropogenic sound in the water. Also, as described in Chapter 5 (Mitigation) of the EIS/OEIS, the Navy implements the most practical mitigation measures with the aim of achieving the least practicable adverse impacts to marine mammal species or stocks, ensuring a negligible impact on marine mammal species and stocks (as required under the Marine Mammal Protection Act), and ensures that Navy training and testing activities do not jeopardize the continued existence of endangered or threatened species, or result in destruction or adverse modification of critical habitat (as required under the Endangered Species Act).
20	State: S05-07	The DEIS states that "monitoring and research data, albeit with small sample sizes, suggests that individual false killer whales do not respond to U.S. Navy mid-frequency active sonar in such a way that would reduce their use of a geographic area. These identified small and resident population areas are mostly located within shallow, near shore waters where the Navy does not typically conduct activities that involve sonar or other transducers, especially more intense activities such as anti-submarine warfare activities or major training events. While impacts on false killer whales' natural behaviors due to training and testing with sonar and other transducers may occur within	The Navy uses the best available science to make their decisions and estimate their takes. In cases where there are only one or two animals to serve as examples, other similar species are relied on to infer information when possible. In order to facilitate research becoming available, the Navy funds researchers worldwide, including in Southern California and Hawaiian waters, including tagging, monitoring, behavioral response to sonars and explosives, etc., on a variety of species. This data, along with all other best available science, is thoroughly reviewed in the EIS/OEIS and relied upon to

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
		the small and resident population areas, they are unlikely to rise to the level of significant under NEPA nor would they be sustained for a duration long enough that it caused an animal to be outside of normal daily variations in feeding, reproduction, resting, migration/movement, or social cohesion." Although this DEIS has compiled an immense amount of cetacean research material overlaid with the geographical delineations of areas of navy training and testing, to estimate the level of impact that will be incurred on each cetacean, pinniped or turtle species, the impact of these activities (such as mid-frequency acoustic sonar exposure) on cetacean behaviors is not well characterized in many of the species because of the small sample sizes. In some instances, only one or two animals were tagged during concurrent periods of training and testing. The reactions of these single animals are then used to characterize how an entire population may react to the various types of training and testing.	analyze potential impacts to animals exposed to training and testing activities. However, the Navy will continue to assess new data as it becomes available to inform future impact analysis. For a detailed analysis of what information was used and how criteria was determined for each hearing group, please see the technical report, *Criteria and Thresholds for U.S. Navy Acoustic and Explosive Effects Analysis (Phase III)* (U.S. Department of the Navy, 2017), available on the project website at: https://hstteis.com/Documents/2017-Hawaii-Southern-California-Training-and-Testing-Draft-EIS-OEIS/Supporting-Technical-Documents.
21	State: S05-08	After documenting the unresponsive activity of single false killer whale for a Navy research project that monitored responses of cetaceans to MFAS, one of the statements in the subsequent report was that "prior exposure history likely influences individual responses to MFAS exposures (Falcone et al. 2008; DeRuiter et al. 2013; Harris and Thomas 2015; Southall et al. 2016). Thus, we suggest that our results not be extrapolated to these species in general, particularly in areas where sonar is used less regularly than at PMRF (Pacific Missile Range Facility)". This indicates that populations that exist outside of areas which are regularly exposed to sonar and other transducers may react less significantly than populations that are regularly exposed to theses frequencies. Therefore, animals that utilize the Alenuihaha Channel between the islands of Oahu and Hawaii may not be as regularly exposed to the frequencies as animals that utilize the area around Kauai and, as	The Navy uses the best available science to make its decisions and estimate takes. In cases where there are only one or two animals to serve as examples, other similar species are relied on to infer information when possible. However, the Navy will continue to assess new data as it becomes available to inform future impact analysis. The Baird et al. 2017 monitoring report and data is the best available science on the response of false killer whales to MFAS. The Navy continues to fund tagging of false killer whales and other priority species; when new data is available, the Navy will review and integrate into the EIS/OEIS and associated consultations as appropriate. Main Hawaiian Island insular false killer whales are known to move widely and quickly among the Main Hawaiian Islands (Oleson et al. 2010, Baird et al.

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
		a result, may respond with maneuvers that reduce fitness (NAVFAC Pacific I Final Report I Assessing Exposure and Response of Three Species of Odontocetes to Mid-Frequency Active Sonar During Submarine Commanders Courses at the Pacific Missile Range Facility (August 2013 Through February 2015).	2010), and spatial use is known to vary between social groups (Baird et al. and in Van Parijs et al. 2015). Given these results, it is unlikely that the animals found in the Alenuihaha Channel between Maui and Hawaii Islands would be naïve to MFAS. Furthermore, the Navy's Behavioral Risk Function takes into account responses of so-called "naïve" animals, which may not be as regularly exposed to sonar.
22	State: S05-09	There are other instances of extrapolation of data from cetacean research with very small sample sizes or that have had little repeatability over years. Because of this uncertainty in the characterization of responses of cetaceans to navy activity it remains unknown to DAR whether or not sonar and other transducer activity can be conducted in the proposed areas around the MHI and have minimal effect on vulnerable cetacean species as stated in the DEIS. The recovery time from a response to a behavioral or temporary threshold shift take varies between species and populations (depending on geography, regular exposure to navy acoustics, regular depth profile, etc.) and certain populations may be greatly affected by any individual mortality. Another concern is that in order to make direct correlations between MF AS and cetacean mortality or identify MF AS the causation of death, the tissue and bone samples needed for air gas embolism and acoustic trauma analysis need to be collected from a fresh mortality. These immediate types of collections are infrequently obtained due to timing of the observation of the carcass and biodegradation rates. Therefore, delayed but accumulated behavioral responses that constitute a PTS take result may not be documented as such because these initial responses are not actually captured during the short window of observation and then may not be recovered during necropsy.	The Navy uses the best available science to make their decisions and estimate impacts. No new or contradictory science has been presented via public commenting that refutes the Navy's conclusions. In cases where there are only one or two animals to serve as examples, then other similar species are relied on to infer information when possible. The Navy funds researchers worldwide, including tagging, monitoring, behavioral response to sonars and explosives, etc., on a variety of species. This data, along with all other best available science, is reviewed in the EIS/OEIS and relied upon to analyze potential impacts to animals exposed to training and testing activities. However, research does continue to be opportunistic, especially immediate and full necropsies. Carcasses tend to be reported after they have started to decompose or have been predated on, which limits the amount of information available to researchers. The Navy will continue to assess new data as it becomes available to inform future impact analysis. Monitoring associated with activities reports any distressed or injured animals. The presence of numerous small, resident cetacean individuals, documented high abundances, and populations trending to increase for many marine mammal species in the area does not indicate there are any population-level consequences

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
			resulting from decades of ongoing Navy training and testing activities. There is no scientific evidence to indicate that one or even a few mild to moderate temporary threshold shifts (TTSs) per year would lead to any long-term hearing loss (i.e., permanent threshold shift [PTS]). The TTS measured in the cited literature (Tougaard et al. 2015), and those cited by it, was approximately 40 Db, 24 hours after the exposure. This indicates the initial threshold shift a few minutes after exposure was likely well above 40 Db, correlated to a much longer period of exposure not related to how Navy sonar is employed. Further, based on the Navy criteria (40 Db of TTS measured a few minutes after exposure), these exposures would have been considered injurious and would have been accounted for in the Navy model as a PTS take. Additionally, such exposure substantially exceeds the Navy's threshold for auditory injury, so the resulting PTS cannot be attributed to an accumulation of effect from TTS-inducing exposures.
23	State: S05-10	False Killer Whales (Main Hawaiian Islands (MHI) Insular Stock) The proposed takes for Main Hawaiian Islands (MHI) Insular Stock False Killer Whales (FKW) from sonar and other transducers over a five-year period (pg.) indicate that behavioral takes (1,873-2,381) will occur on individuals of the entire population (~ 151) at least 12-15 times over this period or that that behavioral takes will occur on some individuals at an increased rate (> 12-15 times) while other individuals may not be affected. For a population whose survival is vulnerable to any mortality in excess of the amount of one (1) per five-year period, the amount of behavioral takes needs to be reduced in order to minimize stress on regular activities and abilities of the animal. Similarly, the amount of TTS (temporary threshold	The Navy analyzes for TTS and PTS effects to the stock level for these species, which is presented in Section 3.7.3.1.2.3 (Impacts from Sonar and Other Transducers Under the Action Alternatives). The majority of estimated impacts are behavioral. Small numbers of TTS are estimated for these populations around the Hawaiian Islands such that most individuals would not receive TTS, and a small number of individuals could receive one to a few TTS per year; no mortality impacts are predicted. TTS only temporarily suppresses a portion of an animal's hearing and the animal would most likely recover completely within a period of minutes to hours. Additionally, TTS thresholds are used conservatively in

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
		shifts-temporary loss of hearing) takes proposed (between 39 and 59) over this time period is regarded as unsustainable and potentially detrimental to the survival of the MHI Insular Stock FKW population. As any TTS (temporary threshold shifts) could interfere with an animal's regular echolocation and acoustical capabilities used for foraging, migration, reproduction or socialization activities, depending on the length and severity of the TTS, any single incidence could result in the mortality of an individual. Although short periods of TTS (minutes) may prove insignificant to the animal, it is uncertain whether long periods of TTS or compounded behavioral or TTS responses may result in separation from groups, disorientation, difficulty foraging for long periods of times (hour to days), difficulty navigating, the increased potential to move out of habitat, etc. These deviations from regular abilities to navigate and forage may result in potential mortalities, which, combined with other incidental mortalities occurring from commercial fishing interactions, other anthropogenic sources or natural causes, compounds the risk, which indicates that this population may be seriously affected. DAR recommends that the Department of the Navy modify the areas in which the proposed activities involving actions that produce any similar numbers of behavioral, TTS (temporary threshold shifts) or PTS (permanent threshold shifts), in order to reduce the risk of mortality by these testing and training exercises.	the Navy's model in that they do not account for recovery of the ear in between noise exposures (e.g., individual sonar pings) and assume animals are ideal receivers (i.e., facing the sound source). There is no scientific evidence to indicate that one or even a few mild to moderate TTSs per year would lead to any long-term hearing loss (i.e., PTS), and no scientific evidence to support the claim that "any single incidence [of TTS] could result in the mortality of an individual." Furthermore, the Navy's take estimates do not include consideration of mitigation areas, which were assessed qualitatively in the Final EIS/OEIS. The Navy developed several new mitigation areas based in part on known high-use areas of false killer whales in the Hawaii Range Complex. Four of the Navy's newly developed or expanded mitigation areas overlap with the False Killer Whale Small and Resident Population Area of the Main Hawaiian Islands Insular Stock. In addition to mitigation areas, the Navy will implement procedural mitigation for acoustic sources (including active sonar), explosives, and physical disturbance and strike stressors whenever and wherever these activities take place within the Study Area, as described in Section 5.3 (Procedural Mitigation to be Implemented). Based on all these measures, the actual level of takes is unlikely to reach the estimated level and has been determined not to affect the stock. The Navy determined that implementing mitigation beyond what is described in Section 5.3 (Procedural Mitigation to be Implemented) and Section 5.4 (Mitigation Areas to be Implemented) would be impracticable due to implications for safety, sustainability, and Title 10 requirements for the reasons

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
			more fully described in Appendix K (Geographic Mitigation Assessment) and Chapter 5 (Mitigation).
24	State: S05-11	Melon-headed Whales As outlined in the DEIS, biologically important areas (BIAs) have been set up for these species, and one in particular, the Kohala resident melon-headed whales, is particularly at risk. The concerns for Kohala resident melon-headed whales were recently discussed in an Endangered Species Research publication Nowhere to go: noise impact assessments for marine mammal populations with high site fidelity (Forney et al., 2017) and is additionally discussed in the book, The Lives of Hawai'i's Dolphins and Whales: Natural History and Conservation (Robin Baird, 2016). The proposed takes for Melon-headed Whales from sonar and other transducers over a five-year period (pg.) indicate that behavioral takes (6,000-6,200) will occur on a majority of the individuals of the entire population (~ 3000-6000) at least once over this period or that behavioral takes will occur on some individuals at an increased rate (more than once) while other individuals may not be affected. For a population whose survival is vulnerable because of unknown population numbers and high susceptibility to MFAS as documented in earlier years in Kauai RimPac exercises, the amount of behavioral takes needs to be reduced in order to minimize stress on regular activities and abilities of the animal. Similarly, the amount of TTS (temporary threshold shifts-temporary loss of hearing) takes proposed (between 188 and 190) over this time period is regarded as unsustainable and potentially detrimental to the survival of the Hawaii or Kohala stock melon-headed whale population. As any TTS (temporary threshold shifts) could interfere with an animal's regular echolocation and acoustical capabilities used for foraging, migration, reproduction or socialization activities, depending on the length and severity of	The Navy analyzes for TTS and PTS effects to the stock level for these species, which is presented in Section 3.7.3.1.2.3 (Impacts from Sonar and Other Transducers Under the Action Alternatives) of the Final EIS/OEIS. The vast majority of estimated impacts are behavioral, and no injury or mortality impacts are predicted. Small numbers of TTS are estimated for these populations around the Hawaiian Islands such that most individuals would not receive TTS, and a small number of individuals could receive one to a few TTS per year. TTS only temporarily suppresses a portion of an animal's hearing and the animal would most likely recover completely within a period of minutes to hours. Additionally, TTS thresholds are used conservatively in the Navy's model in that they do not account for recovery of the ear in between noise exposures (e.g., individual sonar pings) and assume animals are ideal receivers (i.e., facing the sound source). As there were no known mortalities or injuries in the decades of Navy training and testing activities in the Study area, there are no PTS, injury, or mortality takes estimated for any stock of melon-headed whales. There is no scientific evidence to support the claim that "any single incidence [of TTS] could result in the mortality of an individual." The Navy's estimated impacts do not take into consideration that the Navy has developed new mitigation areas that overlap the habitat of melon-headed whales. The Navy determined that implementing mitigation within mitigation areas beyond what is described in Section 5.4 (Mitigation Areas to be Implemented) would be impracticable due to implications for safety, sustainability, and Title 10

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
		the TTS, any single incidence could result in the mortality of an individual. Although short periods of TTS (minutes) may prove insignificant to the animal, it is uncertain whether long periods of TTS or compounded behavioral or TTS responses may result in separation from groups, disorientation, difficulty foraging for long periods of times (hour to days), difficulty navigating, the increased potential to move out of habitat, etc. These deviations from regular abilities to navigate and forage may result in potential mortalities, which, combined with other incidental mortalities occurring from commercial fishing interactions, other anthropogenic sources or natural causes, compounds the risk, which indicates that this population may be seriously affected. DAR recommends that the Department of the Navy modify the areas in which the proposed activities involving actions that produce any similar numbers of behavioral, TTS (temporary threshold shifts) or PTS (permanent threshold shifts), in order to reduce the risk of mortality by these testing and training exercises.	requirements for the reasons more fully described in Appendix K (Geographic Mitigation Assessment). Information on strandings speculated but not linked to U.S. Navy sonar activities, including an event that included melon-headed whales, is presented in Section 4.3 (Hawaii, July 3–4, 2004) of the 2017 technical report titled Marine Mammal Strandings Associated with U.S. Navy Active Sonar Activities.
25	State: S05-12	Dwarf Sperm Whales Another concern from the division is the proposed PTS takes for cetaceans that have deeper depth profiles. One example of this is for dwarf sperm whales; estimated impacts from sonar and other transducers over a five-year period indicate that the predicted amount of PTS (permanent threshold shifts-permanent loss of hearing) takes is 42, each one potentially resulting in a mortality. In addition, the amount of behavioral takes (12,772-13,208) and TTS takes (16,929-17,059) are indicated to occur on a majority of the population at least once over this period or to occur on some individuals at an increased rate, while other individuals may not be affected. A 2002 shipboard line-transect survey of the entire Hawaiian Islands EEZ resulted in an abundance estimate of 17,519 (CV=0.74) dwarf sperm whales (Barlow 2006), including a	As in the decades of Navy training and testing activities in the Study Area with no known mortalities or injuries, there are no injury or mortality takes estimated for the Hawaiian stock of dwarf sperm whales as part of the HSTT Proposed Action. There is no evidence to support the claim that species with deeper depth profiles will have a "higher chance of mortality."

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
		correction factor for missed diving animals. There were no on-effort sightings of dwarf sperm whales during the 2010 shipboard survey of the Hawaiian EEZ (Bradford et. Al. 2013), such that there is no current abundance estimate for this stock. Although this species may have a larger population compared to above mentioned vulnerable stocks (population estimates are +/- 17,519), there is resighting data to suggest that an island-resident population with restricted range may exist, which might warrant the division of this population into a separate island-associated stock in the future. This species is one of a few species identified in the table E3 (Estimated Impacts Marine Mammal Impacts Per Five Year Period From Sonar and Other Transducers Under Navy Training Activities) with deeper depth profiles that will be exposed to permanent threshold shifts which indicates a higher chance of mortality. DAR recommends that the amount of behavioral takes needs to be reduced in order to minimize stress on regular activities and abilities of the animal. The amount of TTS and PTS takes proposed (TTS: 17,059 and PTS: 42) over this time period is regarded as potentially excessive to possibly smaller populations (island-associated stock), as any TTS or PPS (temporary or permanent threshold shifts) could interfere with an animals regular echolocation and acoustical capabilities used for foraging, migration, reproduction or socialization activities, depending on the length and severity of the TTS, and any single incidence of TTS or PPS could result in the mortality of an individual. Although short periods of TTS (minutes) may prove insignificant to the animal, it is uncertain whether long periods of TTS or compounded behavioral or TTS responses may separation from groups, disorientation, difficulty foraging for long periods of times (hour to days), difficulty navigating, the increased potential to move out of habitat, etc. These deviations from regular abilities to navigate and forage may	

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
		result in potential mortalities, which, combined with other incidental mortalities occurring from other anthropogenic interactions and sources or natural causes, compounds the risk, which indicates that this population may be seriously affected. DAR recommends that the Department of the Navy modify the areas in which the proposed activities involving activities that produce any similar numbers of behavioral, TTS (temporary threshold shifts) or PTS (permanent threshold shifts) in order to reduce the risk of mortality by these activities.	
Stranding			
26	Individuals: CHENI CUCJU-03 KALLE KENMA LEVJU MAJSA MAKSH-02 MEEAV STERO-02 WALDE	There were 10 comments submitted regarding concern for stranding marine mammals, specifically in regard to the recent stranding event on Kauai.	The National Marine Fisheries Service notified the Navy on October 13, 2017, that at least five pilot whales live-stranded and later died at Kalapaki Beach, Lihue, Kauai. Information on this event from NOAA is available online at: https://www.pifsc.noaa.gov/news/pilot_whale_stranding.php NOAA is still investigating the cause of the stranding; however, the Navy's records confirmed that there was no use of mid-frequency active sonar or in-water explosives within 70 nm of Nawiliwili Bay during the two days preceding the stranding. Globally, pilot whales (long-finned and short-finned) are one of the most common species to mass strand, and are also known to singly strand (Sergeant, 1982; Perrin et al., 2002; Chambers & James, 2005; Sundaram et al., 2006; Beatson et al., 2009; Jefferson et al., 2015; Sierra et al., 2016; Huertas & Lagueux, 2016; Nash et al, 2016; Hamilton, 2017; Zhao et al., 2017). Mass strandings of pilot whales have been described by news sources and regulatory agencies from around the world including India, Sri Lanka, Indonesia, Scotland, and various locations around the USA. In the Pacific, for instance,

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
			there have been large numbers of pilot whale mass strandings in Australia and New Zealand (McManus et al., 1984; Chambers & Jones, 2005; Beatson & O'Shea, 2009, Nash et al., 2016; Hamilton, 2017). The largest pilot whale mass stranding in recorded history has been reported as over 1,000 animals that stranded on Chatham Islands, New Zealand in 1918 (New Zealand Department of Conservation, 2018). The most recent large mass stranding was another New Zealand stranding of between 400 and 700 pilot whales in February 2017. In Hawaii, four pilot whale mass strandings were recorded between 1957 and 1959, two of which occurred on Kauai (Maldini et al., 2005). There have also been reports of single pilot whale strandings in Hawaii from 1957 to 2014 (Maldini et al., 2005; NMFS, unpublished data). Fossil records indicate mass strandings of marine mammals occurring in the Miocene epoch millions of years prior to human presence (Pyenson et al., 2014). Like any wildlife population, there are natural mortality events that influence marine mammal population dynamics, including starvation, predation, aging, reproductive success, and disease (Carretta et al., 2007; Geraci et al., 1999). Strandings may be reflective of this natural cycle or caused by anthropogenic sources (i.e., human impacts) (Carretta et al., 2016; Cassoff et al., 2011; McGeady et al., 2016). Current science suggests that multiple factors, both natural and man-made, may act alone or in combination to cause a marine mammal to strand (Culik, 2004; Geraci et al., 1999; Geraci & Lounsbury, 2005; National Research Council, 2006; Perrin & Geraci, 2002) Contributing factors and direct causes for marine mammal strandings may be both

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
			natural and anthropogenic and are discussed in the Marine Mammal Strandings Associated With U.S. Navy Sonar Activities Technical Report. A strong case for certain strandings has been made that beach and shore geometry can create acoustic dead zones in which the whale's biological sonars have difficulty getting sufficient resolution to navigate away from the shore (Chambers & Jones, 2005; Sundaram et al., 2006; Hamilton, 2017). The October 2017 Kauai pilot whale mass stranding occurred in an indented bay, a bay type described by Hamilton (2017) as one category of coastal morphology with shallow bathymetry that could lead to whale navigation confusion and contribute to mass strandings. In conclusion, while NOAA is still investigating the October 13, 2017 Kauai pilot whale mass stranding, the Navy's records confirmed that there was no use of mid-frequency active sonar or in-water explosives within 70 NM of the entrance to Nawiliwili Harbor during the two days preceding the stranding.
27	Individuals: LESDO-01 MAKSH-01	There were 2 comments submitted regarding general concern for stranding marine mammals.	As explained in the Navy's technical report on marine mammal strandings (Marine Mammal Strandings Associated with U.S. Navy Sonar Activities, 2017 [Available on the project website: https://hstteis.com/]) marine mammal strandings have been a historic and ongoing occurrence attributed to a variety of causes, both natural and anthropogenic. Over the last 50 years, increased awareness and reporting has led to more information about species affected and raised concerns about anthropogenic sources of stranding. While there have been limited numbers marine mammal mortalities potentially associated with U.S. Navy activities, the root causes are not clear in most cases.

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
Corrections/Typos/other errors in document			
28	State: S09	Please update our mailing address: Senator Toni Atkins 39’” Senate District 1350 Front St., Rm. 4061 San Diego, CA 92101	The senator’s mailing address has been corrected for future mailings. Thank you.
Acoustics and Explosives			
29	Individuals: CAVRA-01 CAVRA-02 LEVNA-02	I contend that the HSTT DEIS (2017) has many serious problems. I felt compelled to comment on one of particular concern: the mammoth overestimation* of the numbers of MMPA harassment ‘takes’ by Navy sonar testing and training in the HSTT range. [*For an example of the overestimation of take counts in the HSTT DEIS, see the one-page attachment to this letter.]	The vast majority of takes under the MMPA noted in the Draft EIS/OEIS are Level B harassment involving behavioral response which have the “potential to disturb behavioral patterns,” and involve no physical harm or injury. As noted in Appendix E (Estimated Marine Mammal and Sea Turtle Impacts from Exposure to Acoustic and Explosive Stressors Under Navy Training and Testing Activities) and in the species breakdown in Chapter 3.7 (Marine Mammals), these instances of Level B harassment take place over many species, many stocks, and many locations; not to specific populations or critically endangered species in particular. While the Navy does model all of its activities in order to estimate the potential number of takes of marine mammals, this is a conservative estimate due to various reasons listed in the EIS/OEIS. For example, the permanent threshold shift/temporary threshold shift criteria and thresholds, as set by NMFS, include numerous conservative assumptions, such as (1) Navy assumes no recovery of hearing during time intervals between intermittent exposures; and (2) Since most marine mammal temporary threshold shift data have been obtained using exposure durations of tens of seconds up to an hour, much longer than the durations of many tactical sources, the use of the existing marine mammal temporary threshold shift data tends to over-estimate the effects of

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
			sonars with shorter duration signals. Also, the benefits of mitigation areas are discussed qualitatively and have not been factored into the quantitative analysis process or reductions in take for MMPA impact estimates, and the Navy elected to account only for the minimum number of required Lookouts used for each activity; therefore, the mitigation effectiveness factors may underestimate the likelihood that some marine mammals and sea turtles may be detected during activities that are supported by additional personnel who may also be observing the mitigation zone.
30	Federal: F02-12	Therefore, the Commission recommends that the Navy include behavior takes of marine mammals during all explosive activities, including those that involve single detonations.	As stated in the Draft EIS/OEIS Section 3.7.3.2.2.1 (Methods for Analyzing Impacts from Explosives), the derivation of the explosive injury criteria is provided in the technical report titled *Criteria and Thresholds for U.S. Navy Acoustic and Explosive Effects Analysis (Phase III)*. This report was provided as supporting documentation to the Draft EIS/OEIS. There is no evidence to support that animals have significant behavioral reactions to temporally and spatially isolated explosions. The Navy has been monitoring detonations since the 1990s and has not observed these types of reactions. TTS and all other higher order impacts are assessed for all training and testing events that involve the use of explosives or explosive munitions. All Navy's monitoring projects, reports and publications are available on the marine species monitoring webpage (https://www.navymarinespeciesmonitoring.us/).
31	Federal: F02-14	Although the effectiveness of the Navy's mitigation measures has yet to be determined, the circumstances of the deaths of multiple common dolphins during one of the Navy's underwater detonation events within the HSTT study area in March 2011	Based on an extensive review of the incident referred to by the commenter, the Navy revised and updated the mitigation for these types of events. There have been no

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
		(Danil and St. Leger 2011) indicate that the Navy's mitigation measures are not fully effective, especially for explosive activities. It would be more prudent for the Navy to estimate injuries and mortalities based on onset rather than a 50-percent incidence of occurrence. The Navy did indicate that it is reasonable to assume for impact analysis—thus its take estimation process—that extensive lung hemorrhage is a level of injury that would result in wild animal mortality (Department of the Navy 2017a). Thus, it is unclear why the Navy did not follow through with that premise. The Commission recommends that the Navy use onset mortality, onset slight lung injury, and onset GI tract injury thresholds to estimate both the numbers of marine mammal takes and the respective ranges to effect.	further incidents since these mitigation changes were instituted. The Navy used the range to one percent risk of mortality and injury (referred to as "onset" in the Draft EIS/OEIS) to inform the development of mitigation zones for explosives. In all cases, the mitigation zones for explosives extend beyond the range to one percent risk of non-auditory injury, even for a small animal (representative mass = 5 kg). In the Final EIS/OEIS, the Navy has clarified that the "onset" non-auditory injury and mortality criteria are actually one percent risk criteria. Over-predicting impacts, which would occur with the use of one percent non-auditory injury risk criteria in the quantitative analysis, would not afford extra protection to any animal. The Navy, in coordination with NMFS, has determined that the 50 percent incidence of occurrence is a reasonable representation of a potential effect. Although the commenter implies that the Navy did not use extensive lung hemorrhage as indicative of mortality, that statement is incorrect. Extensive lung hemorrhage is assumed to result in mortality, and the explosive mortality criteria are based on extensive lung injury data [See the technical report titled *Criteria and Thresholds for U.S. Navy Acoustic and Explosive Effects Analysis (Phase III)*.
32	Federal: F02-18	Therefore, the Commission again recommends that the Navy (1) provide the total numbers of model-estimated Level A harassment (PTS and slight lung and GI injuries) and mortality takes rather than reduce the estimated numbers of takes based on the Navy's post-model analyses and (2) include the model-estimated Level A harassment and mortality takes in its LOA	As stated in Draft EIS/OEIS Section 3.7.3.1.2.1 (Methods for Analyzing Impacts from Sonar and Other Transducers) and in Section 3.7.3.2.2.1 (Methods for Analyzing Impacts from Explosives), the consideration of marine mammal avoidance and mitigation effectiveness is integral to the Navy's overall analysis of impacts from

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
		application to inform NMFS's negligible impact determination analyses.	sonar and explosive sources. Details of this analysis are provided in the technical report titled *Quantifying Acoustic Impacts on Marine Mammals and Sea Turtles: Methods and Analytical Approach for Phase III Training and Testing*. As discussed in the 2017 technical report titled *Quantifying Acoustic Impacts on Marine Mammals and Sea Turtles: Methods and Analytical Approach for Phase III Training and Testing*, animats in the Navy's acoustic effects model do not move horizontally or "react" to sound in any way. The current best available science based on a growing body of behavioral response research shows that animals do in fact avoid the immediate area around sound sources to a distance of a few hundred meters or more depending upon the species. Avoidance to this distance greatly reduces the likelihood of impacts to hearing such as temporary and permanent threshold shift (TTS and PTS, respectively). Specifically, the ranges to PTS for most marine mammal groups are within a few tens of meters and the ranges for the most sensitive group, the HF cetaceans, average about 200 m, to a maximum of 270 m in limited cases; however, high-frequency (HF) cetaceans such as harbor porpoises have been observed reacting to anthropogenic sound at greater distances than other species and are likely to avoid their zones to hearing impacts (TTS and PTS) as well. As discussed in the 2017 technical report titled *Quantifying Acoustic Impacts on Marine Mammals and Sea Turtles: Methods and Analytical Approach for Phase III Training and Testing*, the Navy's acoustic effects model does not consider procedural mitigations (i.e.,

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
			power-down or shut-down of sonars, or pausing explosive activities when animals are detected in specific zones adjacent to the source), which necessitates consideration of these factors in the Navy's overall acoustic analysis. Credit taken for mitigation effectiveness is extremely conservative. Not considering animal avoidance and mitigation effectiveness would lead to a great overestimate of injurious impacts.
33	State: S01-03 S01-04	We note that the DEIS reflects the Navy's historic position that continued robust populations of marine mammals in southern California, in the face of decades of historic Navy testing and training, combined with a lack of visible strandings which might be linked to Navy activities, provides evidence that HSTT activities are not adversely affecting populations of marine mammals. The problem presented under this position is that it is difficult to objectively analyze, for three reasons: (1) the absence of true baseline information; (2) distances from shore of most of the activities, which virtually precludes evidence of strandings; and (3) the many uncertainties over the our understanding of the effects of underwater acoustics on marine mammals. Recent studies such as those performed on beaked whales (and cited in the DEIS) provide intriguing results (e.g., Falcone et al., 2017), but remain far from able to answer the questions about why beaked whale strandings worldwide correlate so closely with mid-frequency military sonar use.	Robust populations of marine mammals in Southern California, in the face of decades of Navy training and testing, combined with a lack of strandings associated with Navy activities does present strong evidence that HSTT activities are not causing adverse impacts to marine mammal populations; however, this is not the only evidence relied upon in the analysis provided in the HSTT EIS/OEIS to reach this conclusion. The Navy funds researchers worldwide, including in Southern California waters, to study the potential impacts of sonar training and testing activities on the marine environment. This data, along with all other best available science, is reviewed in Section 3.7.3.1.1.5 (Behavioral Reactions) and relied upon to analyze potential impacts to marine mammals exposed to training and testing activities. The Navy uses the best available science to analyze the trends in populations and environments in order to make decisions and estimate takes. The Navy will continue to assess new data as it becomes available to inform future impact analysis. The distance to shore of Navy training and testing activities does not preclude evidence of strandings. During Navy activities, Navy lookouts report any injured or distressed animals. Since the inception of current monitoring protocols over a decade ago, no marine

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
			mammals have been reported distressed or injured in association with Navy training and testing activities. Falcone et al. (2017) appears to indicate that contextual factors, besides the level of sound received by the animal, plays a strong role in mediating the observed behavioral responses of beaked whales to acoustic sources. The Navy's technical report *Criteria and Thresholds for U.S. Navy Acoustic and Explosive Effects Analysis (Phase III)* is available on the project website and provides details on the derivation of the Navy's current behavioral response functions for beaked whales and other marine mammal groups. The report specifically addresses contextual factors such as proximity (i.e., the distance between the sound source and the marine mammal) which is incorporated into the Navy's quantitative analysis for estimating the numbers of potential behavioral impacts. Falcone et al. (2017) is discussed and considered in the EIS/OEIS, but was not incorporated directly into the development of the Navy's Phase III behavioral response functions due to (1) the Navy's current Behavioral Response Functions were developed and agreed upon with NMFS in 2016, and (2) the Falcone et al. (2017) research lacks paired received level and behavioral response observations necessary as inputs to developing or refining behavioral response functions. However, the Navy's current Phase III behavioral response functions would have predicted behavioral response in beaked whales at the distances observed in the Falcone et al. (2017) research associated with exposure to ASW helicopter dipping sonar. The Navy will continue to work with researchers in the future and further refine its approach to assessing impacts to marine species as new data becomes available, but no

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
			new research to date, including the Falcone et al. (2017) study, changes the results of the marine mammal impact analysis or the conclusions reached in the HSTT Draft EIS/OEIS. While there have been limited numbers of marine mammal mortalities potentially associated with U.S. Navy activities, the root causes are not clear in most cases. As explained in the Navy's technical report on marine mammal strandings (Marine Mammal Strandings Associated with U.S. Navy Sonar Activities, 2017 – Available on the project website: https://hstteis.com/) marine mammal strandings have been a historic and ongoing occurrence attributed to a variety of causes, both natural and anthropogenic. Over the last 50 years, increased awareness and reporting has led to more information about species affected and raised concerns about anthropogenic sources of stranding.
34	Organization: O04-54 O01-03	"(b) Incorporating effects of dipping sonar As noted above, dipping sonar, like hull-mounted sonar, appears on the basis of preliminary data to be a significant predictor of deep-dive rates in beaked whales on SOAR, with the dive rate falling significantly (e.g., to 35% of that individual's control rate) during sonar exposure, and likewise appears associated with habitat abandonment. Importantly, these effects were observed at substantially greater distances (e.g., 30 or more km) from dipping sonar than would otherwise be expected given the systems' source levels and the beaked whale response thresholds developed from research on hull-mounted sonar (Falcone et al. 2017)." (O04-54) "Importantly, there appear to be no restrictions on the use of helicopter-deployed MFAS. For Cuvier's beaked whales, Falcone et al. (2017) recently showed that behavioral responses were	The Navy relied upon the best available science to develop the behavioral response functions in consultation with NMFS. The Navy's current beaked whale BRF acknowledges and incorporates the increased sensitivity observed in beaked whales during both behavioral response studies and during actual Navy training events. The article cited in the comment (Falcone et al. 2017) was not available at the time the behavioral response functions were developed. The new information and data presented in the article were thoroughly reviewed when they became available and further considered in discussions following a presentation in October 2017 at a recent scientific conference. The Navy will incorporate these findings into the Navy's future behavioral response functions as appropriate. However, the Navy's current beaked whale

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
		more pronounced to mid-power helicopter-deployed MFAS than high-power surface ship hull-mounted MFAS. The HSTT DEIS needs to both take into account potentially higher behavioral response to helicopter-deployed MFAS and incorporate measures that may mitigate behavioral effects." (O01-03)	BRF covers the responses observed in the new article since the beaked whale risk function is more sensitive than the other risk functions at lower received levels. Thus far, no new information has been published or otherwise conveyed that would fundamentally change the assessment of impacts or conclusions of this EIS/OEIS. Watwood et al. (2017) found that the durations of helicopter dipping events were generally short (< 2 hours), while hull-mounted sonar events, or events with both types of sonar present, lasted much longer. The number of group vocal periods were similarly reduced during the periods of helicopter-dipping and hull-mounted sonar activity, and then returned to pre-sonar levels in the periods just after the events. However, there was significantly less of a decline in group vocal periods for helicopter-dipping sonar than there was for hull-mounted sonar. In addition, during periods of hull-mounted sonar the beaked whales not only decreased their dives but moved to the edges of the range, as observed at PMRF by Manzano-Roth et al. (2017). In contrast, although there were fewer group vocal periods during helicopter-dipping sonar than before or after, the dives that did occur remained in the same general area on the range. This may be why there were more changes to beaked whale dive behavior for helicopter-dipping sonar than for hull-mounted sonar, as found in Falcone et al. (2017). Since the locations of helicopter-dipping sonar events are random across the range and of short duration, beaked whales respond by increasing the durations of their dives rather than moving off the range to avoid the area. Due to lower power settings for dipping sonar, potential impact ranges of dipping sonar

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
			are significantly lower than surface ship sonars. For example, the HSTT average modeled range to temporary threshold shift of dipping sonar for a 1-second ping on low-frequency cetacean (i.e., blue whale) is 77 m, and for mid-frequency cetaceans including beaked whales is 22 m (HSTT Draft EIS/OEIS Table 3.7-7). Limited ping time and lower power settings therefore would limit the impact from dipping sonar to any marine mammal species. As described in Section 5.3.2.1 (Active Sonar), the Navy will implement procedural mitigation for mid-frequency active sonar activities whenever and wherever these activities occur in the Study Area (including activities involving the use of rotary-wing aircraft). As described in Appendix K (Geographic Mitigation Assessment), new proposed mitigation measures include limiting the annual use of helicopter dipping sonar in the Hawaii Island Mitigation Area. Implementing procedural mitigation beyond what is described in Section 5.3 (Procedural Mitigation to be Implemented), such as increasing the mitigation zones for mid-frequency active sonar to encompass the predicted ranges to behavioral impacts, would be impracticable due to the reasons more fully described in Chapter 5 (Mitigation).
35	Organization: O04-56	(d) Behavioral thresholds for explosives For purposes of take estimation, the DEIS effectively assumes that marine mammals do not respond behaviorally to single explosive detonations. This assumption appears to derive from final rules issued under the Marine Mammal Protection Act for ship-shock trials in the late 1990s and 2000s, and is entirely without empirical support. The Navy's preferred alternative provides for detonations with net explosive weights up to 2000 lbs., enough to sink a vessel. As the Marine Mammal	As stated in the Draft EIS/OEIS Section 3.7.3.2.2.1 (Methods for Analyzing Impacts from Explosives), the derivation of the explosive injury criteria is provided in the technical report titled *Criteria and Thresholds for U.S. Navy Acoustic and Explosive Effects Analysis (Phase III)*. This report was provided as supporting documentation to the Draft EIS/OEIS. There is no evidence to support that animals have significant behavioral reactions to temporally and

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
		Commission observes, "The Navy provide[s] no justification for why it believes that an animal would exhibit a significant behavioral response to two 5-lb. charges detonated within a few minutes of each other but would not exhibit a similar response for a single detonation of 50 lbs., let alone detonations of up to 2000 lbs." To restate the Commission's conclusion: The Navy, in estimating takes and assessing impacts, should accept that all in-water explosive activities, including those involving single detonations, can cause behavioral takes.	spatially isolated explosions. The commenter is reminded that any reaction to a stressor does not constitute a take as defined in the MMPA for military readiness activities. There is no evidence, and none was provided by the commenter, that a single, brief sound exposure would result in a significant alteration or abandonment of natural behaviors. The Navy has been monitoring detonations since the 1990s and has not observed these types of reactions. Temporary threshold shift (TTS) and all other higher order impacts are assessed for all training and testing events that involve the use of explosives or explosive munitions. All Navy's monitoring projects, reports and publications are available on the marine species monitoring webpage (https://www.navymarinespeciesmonitoring.us/).
36	Individuals: LIZCH	Aloha, Thank you for the opportunity to provide comments on the draft EIS/OEIS. I would like to direct the Navy's attention to this paper, published on September 17, 2017 regarding the impact of sonar on marine mammals, particularly whales and dolphins. Parsons ECM (2017) Impacts of Navy Sonar on Whales and Dolphins: Now beyond a Smoking Gun? Front. Mar. Sci. 4:295. Doi: 10.3389/fmars.2017.00295 https://www.frontiersin.org/articles/10.3389/fmars.2017.00295/full Thank you	The Navy is aware of the cited article, and has already assessed and incorporated the research cited in that article into the Draft EIS/OEIS as appropriate.
37	Organization: O01-01	Studies of movements of satellite-tagged individuals of several species exposed to MFAS at PMRF have not revealed large-scale movements away from MFAS sources (Baird et al. 2017b), increasing the likelihood that individuals may be exposed to MFAS levels high enough to lead to temporary threshold shifts (TTS). If individuals are repeatedly exposed to MFAS at levels that may cause TTS, this could lead to permanent threshold shifts (PTS). This has been shown for terrestrial animals (Kryter et al. 1966, Lonsbury-Martin et al. 1987, Kujawa and Kiberman	The Navy analyzes for TTS and PTS effects to the stock level for the species as presented in Section 3.7.3.1.2.3 (Impacts from Sonar and Other Transducers Under the Action Alternatives). The vast majority of estimated impacts are behavioral. Small numbers of TTS are estimated for these resident odontocete populations around the Hawaiian Islands such that most individuals would not receive TTS, and a small number of individuals could receive one to a few TTS per year. TTS only

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
		2009, Lin et al. 2011, Wang and Ren 2012) and suggested that it may also occur for marine mammals (Kastak et al. 2008, National Marine Fisheries Service 2016). Such potential for PTS occurring within resident populations of odontocetes in Hawaii, and the potential individual- and population-level consequences, needs to be addressed in the HSTT DEIS, particularly in light of the ineffectiveness of the proposed mitigation measures (see below).	suppresses a portion of an animal's hearing and complete recovery normally occurs within a period of minutes to hours. Additionally, TTS thresholds are used conservatively in the Navy's model in that they do not account for recovery of the ear in between noise exposures (e.g., individual sonar pings) and assume animals are ideal receivers (i.e., facing the sound source). There is no scientific evidence to indicate that one or even a few mild to moderate TTSs per year would lead to any long-term hearing loss (i.e., PTS). The cited literature is primarily concerned with chronic noise exposure to humans and terrestrial mammals, which is a far different exposure scenario than that employed by the Navy in its sonar activities. The results of Kryter et al., 1966, in which the subject is assumed to be exposed to noise for the equivalent of eight hours daily for 10 years. Similarly, for Lonsbury-Martin et al, 1987, the monkeys were exposed to noise for four hours daily for 6–18 months. The TTS measured by Kujawa and Liberman (2009) was approximately 40 dB, 24 hours after the exposure. This indicates the initial threshold shift a few minutes after exposure was likely well above 40 dB, correlated to a much longer period exposure not related to how Navy sonar is employed. Further, based on the Navy criteria (40 dB of TTS measured a few minutes after exposure), these long-time exposures would have been considered injurious and would have been accounted for in the Navy model as a PTS take. Similarly, the maximum threshold shift in auditory brainstem responses reported by Lin et al. 2011 was 50 dB measured 10 minutes post-exposure, and those reported by Wang and Ren (2012) were 35–40 dB measured 24 hours post-exposure, both indicative of exposures not related to how Navy sonar is employed.

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
			The only cited reference to deal with marine mammals was Kastak et al. (2008). Again, the exposure in that study produced PTS (202 dB SEL at 4.1 kHz) and substantially exceeded the Navy's threshold for auditory injury, so the resulting PTS cannot be attributed to an accumulation of effect from TTS-inducing exposures.
38	Organization: O02-03	Given that HSTT activities have been barraging marine mammal populations for years with similar levels of harmful sonar and explosions, one would reasonably expect that eliminating this chronic source of stress and injury would have substantial environmental benefits, allowing resident populations of marine individuals to recover from years of abuse.	While the estimated number of takes of marine mammals under the MMPA is high, as the EIS/OEIS notes, the Navy is conservative in its estimate of takes. Studies have shown that the Navy is not having a population-level adverse impact on marine species subjected to repeated exposure to Navy activities many of which, conversely, continue to increase in number or are maintaining populations based on what regional conditions can support.
39	Organization: O02-10	The Navy's revised DEIS also must consider alternatives that impose time/area restrictions beyond the compromise embodies in the 2015 Settlement. Both the 2015 Settlement and the DEIS's proposed time/area restrictions focus on addressing the harmful effects of mid-frequency active sonar that is hull-mounted on surface ships. A recent, peer-reviewed study of Cuvier's beaked whales exposed to Navy training and testing off Southern California found the whales often respond more strongly to mid-power, helicopter-deployed dipping mid-frequency active sonar than to high-power, hull-mounted, surface-ship mid-frequency active sonar at comparable closer ranges (within approximately 50 kilometers). See Falcone et al. (2017). The Navy must, therefore, examine alternatives that impose time/area restrictions on the use of dipping sonar, in addition to restrictions on sonar that is hull-mounted on surface ships.	The potential effects of dipping sonar have been accounted for in the Navy's analysis. The information in Falcone et al. (2017) does not fundamentally change the assessment of impacts or conclusions of this EIS/OEIS. The Navy relied upon the best available science to develop the behavioral response functions in consultation with NMFS. The article cited in the comment (Falcone et al. 2017) was not available at the time the Draft EIS/OEIS was published. The new information and data presented in the article was thoroughly reviewed when it became available and included in the HSTT Final EIS/OEIS. Additionally, the Navy's current beaked whale behavioral response function acknowledges and incorporates the increased sensitivity observed in beaked whales during both behavioral response studies and during actual Navy training events. The Navy will incorporate the findings from this latest study into the Navy's future behavioral

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
			response functions as appropriate. Dipping sonar has been used for decades where the Navy trains and tests, and there have been no indications of population-level impacts resulting from its use. The Navy's alternatives were developed to satisfy the Navy's purpose and need related to fulfilling its Title 10 requirements. Consistent with 40 C.F.R. 1502.14, the Navy has included a robust suite of mitigation measures, which will be implemented under either action alternative (i.e., regardless of which alternative is selected). In collaboration with NMFS, the Navy completed a biological assessment and operational analysis of potential mitigation areas throughout the entire Study Area. As described in Appendix K (Geographic Mitigation Assessment), new proposed mitigation measures include limiting the annual use of helicopter dipping sonar in the Hawaii Island Mitigation Area. The Navy has implemented procedural mitigation for all active sonar activities (including dipping sonar) within the Study Area, as described in Section 5.3.2.1 (Active Sonar).
40	Organization: O07-01	Over the years, COAST and other organizations, members of the scientific community, and concerned citizens, have submitted comments on a number of sonar-related Navy EISs. The Navy response to numerous specific questions and valid concerns has far too often been to avoid, dismiss, mischaracterize, or outright ignore them. This manner of dealing with the public's comments can in no way reasonably be construed as having fulfilled the requirements of the National Environmental Policy Act (NEPA). Because of this, and for other reasons stated in these comments below, the Navy has done little more than go through the outward motions of the NEPA process. In fact the process, as carried out by the Navy for this and other sonar-related EISs, is a sham.	The Navy's consideration and response to all comments received is in compliance with the requirements of NEPA set forth in 40 CFR 1503.4. The Navy project team read and carefully reviewed all comments received on the Draft EIS/OEIS. Substantive comments were identified for consideration of modification of the alternatives, development of alternatives not previously considered, possible updates to the Final EIS/OEIS analysis, factual corrections, or explanations why further response was not required. In several cases, additional mitigation measures, including new mitigation areas (see Section 5.3 (Procedural Mitigation to be Implemented) are now

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
			proposed in the HSTT Final EIS/OEIS as a result of comments and recommendations from the public.
41	State: S05-02	DAR requests there to be further clarification of the anticipated duration of minimum, average and maximum durations of TTS (temporary threshold shifts) specific to the activities the Navy has proposed in geo-referenced areas, in order to correlate affected populations with the severity of the effects of TTS. In order to evaluate the potential effect on certain populations, DAR must receive more information on how long the animal may be restricted in its normal range of abilities to navigate, forage and socialize. The standard definition of TTS (temporary threshold shifts) suggests that some incidences of TTS could result in a temporary loss of hearing ranging from hours to several days. Some literature hypothesizes that the cumulative effects of multiple exposures to behavioral or TTS takes could be considered equal in effect to PTS, such as temporary noise-induced neurological disturbances leading to long term neurological disturbances or disorders (Tougaard et al., Cetacean noise criteria revisited in the light of proposed exposure limits for harbor porpoises, Marine Pollution Bulletin, 2015).	The Navy analyzes for TTS and PTS effects to the stock level for these species, which is presented in Section 3.7.3.1.2.3 (Impacts from Sonar and Other Transducers Under the Action Alternatives) of the Draft EIS/OEIS. The vast majority of estimated impacts are behavioral. Small numbers of TTS are estimated for these populations around the Hawaiian Islands such that most individuals would not receive TTS, and a small number of individuals could receive one to a few TTS per year. There is no scientific evidence to indicate that one or even a few mild-to-moderate TTSs per year would lead to any long-term hearing loss (i.e., PTS) or measurably affect abilities to navigate, forage, and socialize. The TTS measured in the cited literature (Tougaard et al., 2015), and those cited by it, was approximately 40 Db, 24 hours after the exposure. This indicates the initial threshold shift a few minutes after exposure was likely well above 40 Db, correlated to a much longer period of exposure not related to how Navy sonar is employed. Further, based on the Navy criteria for PTS (40 Db of threshold shift measured a few minutes after exposure), these long-time exposures would have been considered injurious and would have been accounted for in the Navy's model as a PTS take. Additionally, such exposure substantially exceeds the Navy's threshold for auditory injury, so the resulting PTS cannot be attributed to an accumulation of effect from TTS-inducing exposures. TTS only temporarily suppresses a portion of an animal's hearing and the animal would most likely recover completely within a period of minutes to hours. Additionally, TTS thresholds are used conservatively in the Navy's model in that they

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
			do not account for recovery of the ear in between noise exposures (e.g., individual sonar pings) and assume animals are ideal receivers (i.e., facing the sound source). The additional information requested by DAR is provided to the National Marine Fisheries Service as part of our coordination with them. Also, please see the *Criteria and Thresholds for U.S. Navy Acoustic and Explosive Effects Analysis (Phase III) Technical Report, June 2017*, available on the project website at: https://hstteis.com/Documents/2017-Hawaii-Southern-California-Training-and-Testing-Draft-EIS-OEIS/Supporting-Technical-Documents.
42	State: S05-03	DAR additionally requests clarification on length of average training or testing of specific sonar applications (e.g. the length at which a sonar will be initiated or sounded repeatedly), which areas these occur in and what events they occur in.	The types, locations, descriptions, and levels of training and testing activities that use sonar are provided in Sections 2.6 (Proposed Training and Testing Activities for Both Alternatives) and 3.0.3.3.1 (Acoustic Stressors), and Appendix A (Navy Activity Descriptions). The marine mammal takes are provided in Appendix E (Estimated Marine Mammals and Sea Turtle Impacts from Exposure to Acoustic and Explosive Stressors Under Navy Training and Testing Activities).
43	State: S05-06	In the DEIS it is stated that "it is important to note that impacts, as discussed in this appendix [Appendix E: Estimated Marine Mammal and Sea Turtle Impacts from Exposure to Acoustic and Explosive Stressors Under Navy Training and Testing Activities], represent the estimated instances of take of marine mammals or sea turtles, not necessarily the number of individuals impacted (i.e., some marine mammals or sea turtles could be impacted several times, while others would not experience any impact)." DAR's concern is that the individual responses to behavioral or TTS takes that are proposed to occur may have cumulative or delayed effects. For example, a cetacean that is exposed to	The Navy analyzes for TTS and PTS effects to the stock level for these species, which is presented in Section 3.7.3.1.2.3 (Impacts from Sonar and Other Transducers Under the Action Alternatives) of the Draft EIS/OEIS. The vast majority of estimated impacts are behavioral. Small numbers of TTS are estimated for these populations around the Hawaiian Islands such that most individuals would not receive TTS, and a small number of individuals could receive one to a few TTS per year. TTS temporarily suppresses a portion of an animal's hearing and the animal would most likely recover completely within a period of minutes to hours. Additionally, TTS thresholds

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
		multiple behavioral or TTS takes may gradually damage integral acoustical structures to the extent that these structures are approaching a degraded state comparable to what would result from a PTS take. Additionally, cetaceans that are exposed to behavioral or TTS takes may engage in energy expending activities that reduce their fitness over time, which compromises their overall fitness and leaves them vulnerable to predation, injury, stress, illness, disorientation, etc., as a result of this reduced fitness. As these repeated exposures compound, they may have reduced ability to recover from haphazard fleeing maneuvers, such as deep diving, extended kicking, missed opportunities to feed, disorientation and movement out of habitat (Tougaard et al., Cetacean noise criteria revisited in the light of proposed exposure limits for harbor porpoises, Marine Pollution Bulletin, 2015).	are used conservatively in the Navy's model in that they do not account for recovery of the ear in between noise exposures (e.g., individual sonar pings) and assume animals are ideal receivers (i.e., facing the sound source). In all areas where beaked whales and other sensitive species are shown to occur, particularly where they may be resident to an area that includes frequent sonar use, animals continue to use the area and often demonstrate no response or only a short-term response to the sonar. Cetaceans near the PMRF range in Hawaii that are known or likely to be resident to the area have been observed moving towards areas of active sonar while continuing their normal behavior, and beaked whales at all Navy ranges seem to leave the area during periods of sonar but then return to the area almost immediately after the sonar has ceased (see Section 3.7.3.1.1.5, Behavioral Reactions, for more details on these studies). There is no scientific evidence to indicate that one or even a few mild-to-moderate TTSs over time would lead to any long-term hearing loss (i.e., PTS). The TTS measured in the cited literature (Tougaard et al., 2015), and those cited by it, was approximately 40 Db, 24 hours after the exposure. This indicates the initial threshold shift a few minutes after exposure was likely well above 40 Db, correlated to a much longer period of exposure not related to how Navy sonar is employed. Further, based on the Navy criteria for PTS (40 Db of threshold shift measured a few minutes after exposure), these exposures would have been considered injurious and would have been accounted for in the Navy model as a PTS take. Additionally, such exposure substantially exceeds the Navy's threshold for auditory injury, so the resulting PTS cannot be attributed to an accumulation of

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
			effect from TTS-inducing exposures. The presence of numerous small, resident cetacean individuals, documented high abundances, and populations trending to increase for many marine mammal species in the area does not indicate there are any population-level consequences resulting from decades of ongoing Navy training and testing activities.
Mitigation and Monitoring			
44	State: S06-02 S08-02 Organization: O16-02 Individuals: CUCJU-01 MONNI-04 MONNI-08 STERO-03	Six comments were submitted with concerns and/or ideas to improve mitigation and/or monitoring.	As discussed in Chapter 5 (Mitigation), the Navy will implement a robust suite of mitigation measures designed to effect the least practicable adverse impact on marine mammal species or stocks and their habitat, and have a negligible impact on marine mammal species and stocks (as required under the Marine Mammal Protection Act), ensure that the Proposed Action does not jeopardize the continued existence of endangered or threatened species, or result in destruction or adverse modification of critical habitat (as required under the Endangered Species Act), avoid or minimize adverse effects on essential fish habitat (as required under the Magnuson Stevens Fishery Conservation and Management Act), and avoid adversely impacting shipwrecks (as required under the Abandoned Shipwreck Act and National Historic Preservation Act). As discussed in Section 5.3 (Procedural Mitigation to be Implemented), the Navy implements procedural mitigation for 21 different activity categories or stressors whenever and wherever those activities occur throughout the Study Area. As discussed in Section 5.4 (Mitigation Areas to be Implemented), the Navy implements additional mitigation for seafloor resources as well as within additional mitigation areas specifically designed to further avoid or reduce potential impacts to

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
			marine mammals in important habitat areas. During the Phase III mitigation development process, the Navy considered several measures that would have unacceptable impacts with regard to personnel safety, practicality of implementation, and impact on effectiveness of the military readiness activities. Information on those measures and why the Navy will not implement them is provided in Section 5.5 (Measures Considered but Eliminated). As described in Chapter 5 (Mitigation) of the EIS/OEIS (especially Section 5.2, Mitigation Development), the Navy evaluated the effectiveness and practicability of numerous potential mitigation measures. Note that Navy does not employ only visual monitoring, but also makes use of passive acoustic detection when available and appropriate. On Navy ships, hand-held binoculars are always available and pedestal mounted binoculars, very similar to those used in marine mammal surveys, are generally available to Navy Lookouts on board vessels over 60 feet. Also like marine mammal observers, Navy Lookouts are trained to use a methodical combination of unaided eye and optics as they search the surface around a vessel. In addition to designated Lookouts, there are always additional bridge watch personnel observing the water around the vessel. Finally, Navy's reliance on visual mitigation has been demonstrated to be effective over years of monitoring associated with Navy training and testing at sea in publically available reports submitted to NMFS since 2006 and accessible on the NMFS Office of Protected Resources website. The Navy is consulting with NOAA under the Marine Mammal Protection Act (MMPA) and Endangered Species Act (ESA) for marine mammals including monk

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
			seals and USFWS for sea turtles and seabirds. Those consultations will result in a Final Rule and a Letter of Authorization under MMPA and a Biological Opinion (containing an Incidental Take Permit) or Letter of Concurrence under ESA.
45	Individuals: HARCO-05	The EIS should specify how it complies with these settlements and court decisions: • July 2016: Ninth Circuit Court ruling that the National Marine Fisheries Service illegally approved a permit authorizing the Navy to use low-frequency active sonar (LFA) in areas important to marine mammals • September 2015: settlement limiting Navy activities in vital marine mammal habitat, after suits against National Marine Fisheries Service by Conservation Council for Hawai'i and Natural Resources Defense Council, • 2007 and 2002: court-ordered settlement allowing use of LFA in significantly reduced areas of the world's oceans, with the promise of sufficient protections under future permits	The 2002, 2007, and 2016 court cases mentioned in the comment do not pertain to the activities proposed in the HSTT EIS/OEIS. The description of the Navy's compliance with the 2015 settlement can be found in response #8 and in Appendix K (Geographic Mitigation Assessment, Section K.5 [Provisional 2015 Prohibited or Restricted Areas within HSTT Study Area]).
46	Federal: F02-15	The Commission is not aware of any additional data that have been made available since 2014 but understands that any data that have been collected since then would not be sufficient to conduct a statistical analysis. The Commission recognizes that the study will be very informative once completed but notes that in the interim, the preliminary data do provide an adequate basis for taking a precautionary approach. Accordingly, the Commission continues to believe that rather than simply reducing the size of the zones it plans to monitor, the Navy should supplement its visual monitoring efforts with other monitoring measures. The Navy did propose to supplement visual monitoring with passive acoustic monitoring during three explosive activity types but not during the remaining explosive activities or during low-, mid- and high-frequency active sonar activities.	Per Section 5.3.3 (Explosive Stressors), for explosive mitigation zones, any additional increases in mitigation zone size (beyond what is depicted for each explosive activity) or observation requirements would be impracticable to implement due to implications for safety, sustainability, and the Navy's ability to meet Title 10 requirements to successfully accomplish military readiness objectives. As discussed in the comment, the Navy does employ passive acoustic monitoring when practicable to do so (i.e., when assets that have passive acoustic monitoring capabilities are already participating in the activity). For other explosive events, there are no platforms participating that have passive acoustic monitoring capabilities. Adding a passive acoustic monitoring capability (either by adding a passive acoustic

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
			monitoring device to a platform already participating in the activity, or by adding a platform with integrated passive acoustic monitoring capabilities to the activity) for mitigation is not practicable. As discussed in Section 5.5.3 (Active and Passive Acoustic Monitoring Devices), there are significant manpower and logistical constraints that make constructing and maintaining additional passive acoustic monitoring systems or platforms for each training and testing activity impracticable. Additionally, diverting platforms that have passive acoustic monitoring platforms would impact their ability to meet their Title 10 requirements and reduce the service life of those systems. Lastly, the mitigation zones for active sonar systems encompass the ranges to potential injury. The lookout effectiveness study mentioned by the commenter is still ongoing. This type of study has never been conducted, is extremely complex to ensure data validity, requires a substantial amount of data to conduct meaningful statistical analysis, and the Navy is committed to completing it. As noted by the commenter, there has not been enough data collected to conduct a sufficient analysis; therefore, drawing conclusions on an incomplete data set is not scientifically valid.
47	Federal: F02-16	Therefore, the Commission again recommends that NMFS require the Navy to use passive and active acoustic monitoring, whenever practicable, to supplement visual monitoring during the implementation of its mitigation measures for all activities that could cause injury or mortality beyond those explosive activities for which passive acoustic monitoring already was proposed.	For explosive events without passive acoustic monitoring, there are no platforms participating in those activities that have passive acoustic monitoring capabilities. Adding a passive acoustic monitoring capability (either by adding a passive acoustic monitoring device to a platform already participating in the activity, or by adding a platform with integrated passive acoustic monitoring capabilities to the activity) for mitigation is not practicable. As discussed in Section 5.5.3 (Active and

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
			Passive Acoustic Monitoring Devices), there are significant manpower and logistical constraints that make constructing and maintaining additional passive acoustic monitoring systems or platforms for each training and testing activity impracticable. Additionally, diverting platforms that have passive acoustic monitoring platforms would impact their ability to meet their Title 10 requirements and reduce the service life of those systems.
48	Organization: O01-02	There are a number of reasons why using lookouts to detect marine mammals is an ineffective way of mitigating harm. Most importantly, the usual sea states that the Navy typically operates in Hawaii, combined with the diving patterns of cetaceans and the cryptic nature of many species, make the probability of visually detecting the majority of cetaceans extremely low. In addition, many training or testing operations occur at night when lookouts are completely ineffective. Lastly, behavioral effects, which may lead to mortality at least on occasion, are likely to occur well beyond the visual horizon of lookouts. For example, Falcone et al. (2017) documented behavioral response by Cuvier's beaked whales to hull-mounted MFAS at distances of up to approximately 100 km from the source.	In coordination with NMFS, the Navy developed its procedural mitigation to avoid or reduce injurious impacts to the maximum extent practicable. The Navy quantitatively assessed the effectiveness of its Lookout mitigation measures on a per-scenario basis for four factors: (1) species sightability, (2) a Lookout's ability to observe the range to permanent threshold shift (for sonar and other transducers) and range to mortality (for explosives), (3) the portion of time when mitigation could potentially be conducted during periods of reduced daytime visibility (to include inclement weather and high sea-state) and the portion of time when mitigation could potentially be conducted at night, and (4) the ability for sound sources to be positively controlled (e.g., powered down). See the technical report *Quantifying Acoustic Impacts on Marine Mammals and Sea Turtles: Methods and Analytical Approach for Phase III Training and Testing*. The g(0) values used by the Navy for their mitigation effectiveness adjustments take into account the differences in sightability with sea state, and utilize averaged g(0) values for sea states of 1–4 and weighted as suggested by Barlow (2015). This helps to account for reduced sightability in varying conditions, and species-

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
			specific dive profiles and behaviors. In addition to implementing procedural mitigation, the Navy is expanding the existing Phase II Humpback Whale Cautionary Area (renamed the 4-Islands Region Mitigation Area) and developing several new mitigation areas to avoid or reduce potential impacts to marine mammals. The Navy determined that implementing mitigation beyond what is described in Section 5.3 (Procedural Mitigation) and Section 5.4 (Mitigation Areas to be Implemented), such as increasing mitigation zone sizes to encompass the predicted ranges to behavioral impacts, would be impracticable as described in Appendix K (Geographic Mitigation Assessment) and Chapter 5 (Mitigation). While Falcone et al. (2017) may have documented some behavioral responses by Cuvier's beaked whales to hull-mounted mid-frequency active sonar out to distances of up to 100 km, these responses were generally mild, such as a slight (<2 min) increase in the duration of shallow dives that was similar to the range of duration variability found in dives when no mid-frequency active sonar was present. The inter-deep dive interval duration also increased for both mid- and high-powered mid-frequency active sonar sources starting at 100 km; however, the inter-deep dive interval duration only exhibited the strongest increase within 20 km. The authors state that "most responses intensify with proximity and were more pronounced...within approximately 50 km." This is the distance cut-off value used in the Navy's estimated modeling of behavioral takes for beaked whales, and therefore would include the majority of responses found by Falcone et al. (2017).

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
49	Organization: O01-04	In addition, while the planning awareness area and the cautionary areas place some restrictions on the use of surface ship hull-mounted MFAS in theory, the restrictions on the west side of Hawaii Island are only applicable to "anti-submarine major training exercise(s)" (p. K-25) and "all other surface ship mid-frequency active sonar by Navy units (e.g., unit level training, maintenance and system checks while in transit) is allowed." For populations that are particularly susceptible to impacts from MFAS (e.g., Cuvier's beaked whales, Blainville's beaked whales), this type of "restriction" is insufficient to provide protection.	Henderson et al. (2017) found that beaked whales at PMRF did not reduce the number of foraging dives in the presence of most training events on the range (which may include mid-frequency active sonar or explosives), in contrast to their avoidance of the immediate area around the longer duration training events described in Manzano-Roth et al. (2017). Therefore, it is unlikely that beaked whales will respond to "all other surface ship mid-frequency active sonar by Navy units [e.g., unit level training, maintenance and system checks while in transit]." The Navy completed a biological assessment and operational analysis of potential mitigation measures throughout the Study Area to develop mitigation areas for the Proposed Action. The mitigation includes an expansion of the existing Phase II Humpback Whale Cautionary Area (renamed the 4-Islands Region Mitigation Area) and the development of a new mitigation area that overlaps habitat for beaked whales. Specific to the west side of Hawaii, the Navy developed the Hawaii Island Mitigation Area, where the amount of surface ship hull-mounted mid-frequency active sonar is limited. In addition to limits on these sonar hours, the Navy shall not use explosives in the Hawaii Island Mitigation Area that would potentially result in the take of marine mammals during training and testing. The Navy balanced the need for the use of the area to meet training and testing requirements with the biological importance of the area for marine mammals. The mitigation area around the island of Hawaii will likely reduce the number and level of impacts on marine mammal species and stocks occurring within the area without compromising military readiness. Implementing

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
			mitigation within mitigation areas beyond what is described in Section 5.4 (Mitigation Areas to be Implemented) would be impracticable as described in Appendix K (Geographic Mitigation Assessment).
50	Organization: O01-05	In the case of the Kohala resident population of melon-headed whales, the entire population may be at risk from a catastrophic event associated with avoidance of sonar, in addition to displacement from their limited habitat (Forney et al. 2017). This population has the most-restricted range of any species of cetacean in Hawaiian waters, and the complete lack of MFAS restrictions in the Alenuihaha Channel, which overlaps with their range, puts this population at particular risk.	The claim that the entire Kohala resident stock of melon-headed whales may be at risk from a catastrophic event associated with active sonar is not supported by the best available science and is not expected to occur. Information on strandings speculated but not linked to U.S. Navy sonar activities, including an event that included melon-headed whales not belonging to the Kohala resident stock, is presented in Section 4.3 (Hawaii, July 3-4, 2004) of the 2017 technical report titled *Marine Mammal Strandings Associated with U.S. Navy Active Sonar Activities*. The Navy's assessment of potential impacts from active sonar on melon-headed whales is presented in Section 3.7.3.1.2.3 (Impacts from Sonar and Other Transducers Under the Action Alternatives). The quantitative analysis estimates behavioral reactions and TTS for training and testing with active sonar under Alternative 1 and Alternative 2. Estimated impacts apply to multiple stocks, with estimated impacts to the Kohala resident stock representing a small fraction of the overall takes to the species (7 percent and 13 percent under Alternative 1 for training and testing, respectively; and 7 percent and 12 percent under Alternative 2 for training and testing, respectively). As described in the discussion for all odontocetes, even a few minor to moderate TTS or behavioral reactions over the course of a year are unlikely to have any significant costs or long-term consequences for that individual. Furthermore, the Navy's estimated impacts to the Kohala resident stock of

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
			melon-headed whales do not take into consideration that the Navy has developed several mitigation areas, one of which (the Hawaii Island Mitigation Area) overlaps the small and resident population area of the Kohala resident stock of melon-headed whales identified by Baird et al. (2015). These mitigation areas are likely to result in an avoidance or reduction of impacts from active sonar and explosives on several species of marine mammals, including the Kohala resident stock of melon-headed whales. Significant impacts on melon-headed whale natural behaviors or abandonment due to training with sonar and other transducers are unlikely to occur within this area. The Navy determined that implementing mitigation within mitigation areas (such as within the Alenuihaha Channel) beyond what is described in Section 5.4 (Mitigation Areas to be Implemented) would be impracticable as described in Appendix K (Geographic Mitigation Assessment).
51	Organization: O02-11	Moreover, the Navy must examine alternatives that would impose restriction on training and testing in biologically important areas beyond those addressed in the 2015 Settlement, including, but not limited to, biologically important areas around Oahu and Kauai/Niihau. In addition to the areas identified as biologically important in Appendix K to the DEIS, the Navy should evaluate alternatives that restrict activities in areas the National Marine Fisheries Service (NMFS) recently proposed as critical habitat for the Main Hawaiian Islands Insular false killer whale. NMFS has identified these areas, "based on the best scientific information available," as "essential to the conservation" of this critically endangered species.	The Navy completed a biological assessment and operational analysis of potential mitigation areas throughout the Study Area, including the biologically important areas (see Appendix K, Geographic Mitigation Assessment). This analysis included assessing the habitat for the main Hawaiian Islands insular stock of false killer whales and beaked whales. In fact, the Navy specifically developed two new mitigation areas based in part on known high-use areas of false killer whales in the Hawaii Range Complex. These new mitigation areas overlap with the False Killer Whale Small and Resident Population Area of the Main Hawaiian Islands Insular Stock, as well as beaked whale Biologically Important Areas.
52	Organization: O02-12	In Appendix K, the Navy rejects considering restrictions on training and testing activities in various marine habitat areas	The Navy considered restrictions such as mitigation areas for marine mammals throughout the Study Area.

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
		identified as biologically important on the grounds that "the Navy does not typically conduct activities that involve sonar or other transducers" there and/or "explosives training and testing is not likely to occur in the biologically important areas." (DEIS at K-73 to K-74) As the district court observed in Conservation Council for Hawaii, "a history of low Navy activity does not demonstrate that time/are restriction…in that area are impractical." Thus, alternatives involving restrictions in such areas must be considered.	During the mitigation development process, the Navy did not develop mitigation areas in locations where stressors are not used because doing so would not meet the basic definition of effective mitigation (i.e., mitigation measures in these areas would not result in an avoidance or reduction of impacts). As described throughout Section K.3 of Appendix K (e.g., K.3.3.1.6.2, K.3.2.3, K.3.7.4.1, and K.3.8.3.1) the infrequent use of a particular area is not an indication that the area is not critical for a particular training exercise, testing mission, or research project. For locations that are used infrequently, the Navy assessed whether developing a mitigation area would meet the appropriate balance between being effective and practicable to implement.
53	Organization: O02-13	The mere fact the Navy does not frequently conduct HSTT activities in a biologically important area does not compel the conclusion that prohibiting activities in that area would not confer environmental benefit. On the contrary, marine mammal individuals and populations that are only rarely exposed to Navy sonar are likely more vulnerable than populations that are regularly exposed to MFA sonar, and, thus, significant benefits may result from prohibiting HSTT activities in areas of low Navy use. See Baird (2013) (enclosed). Adopting time/area restrictions in biologically important areas where HSTT activities currently occur infrequently would, therefore, confer benefits on marine mammals by insuring against future harm.	The critical nature of an area used for training and testing cannot be assessed solely by its frequency of use. As described throughout Section K.3 of Appendix K (e.g., K.3.3.1.6.2, K.3.2.3, K.3.7.4.1, and K.3.8.3.1) the infrequent use of a particular area is not an indication that the area is not critical for a particular training exercise, testing mission, or research project. Animals rarely exposed to sonar appear more likely to exhibit a response; however, this response is likely to be avoidance of the area, making them less likely to receive higher order impacts such as TTS or PTS. For example, data on beaked whales from the Pacific Missile Range Facility show that they likely leave the range or move to the edges of the range during the multi-day Submarine Command Course training events that involve mid-frequency active sonar, but then return to their normal distribution on the range within a few days after the end of the event (Manzano-Roth et al. 2016). However, an analysis of their dive data indicated no reduction in dives

Table H-3: Comment Response Matrix (continued)

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			on the range following shorter training events that may have involved mid-frequency active sonar or explosives (Henderson et al. 2016). These combined data seem to indicate no or limited responses by beaked whales to short duration training events, and avoidance of longer-term training events but with a rapid recovery to baseline behavior. Thus, generalizations that marine mammals rarely exposed to sonar would benefit from prohibitions on sonar is not necessarily demonstrated to be true.
54	Organization: O02-14	Without rigorous, quantitative analysis of the benefits that restrictions in various areas would confer, there is no opportunity for meaningful public comment – including expert comment – on the Navy's analysis, and the public has no way of knowing if the Navy has taking the requisite hard look at ways to minimize impacts.	To consider the benefits of procedural mitigation to marine mammals and sea turtles within the MMPA and ESA impact estimates, the Navy conservatively factored mitigation effectiveness into its quantitative analysis process, as described in the technical report titled Quantifying Acoustic Impacts on Marine Mammals and Sea Turtles: Methods and Analytical Approach for Phase III Training and Testing. The benefits of mitigation areas are discussed qualitatively and have not been factored into the quantitative analysis process or reductions in take for MMPA and ESA impact estimates. Marine mammal mitigation areas are designed to help avoid or reduce potential impacts during biologically important life processes within particularly important habitat areas. Therefore, the mitigation benefit is discussed in terms of the context of impact avoidance or reduction.
55	Organization: O04-01	Following the court's summary judgment ruling, the Navy and NMFS voluntarily entered into a settlement agreement that imposed time and geographic restrictions on HSTT activities to protect marine areas identified as biologically important to various marine mammal populations. In so doing, the agencies acknowledged the feasibility of adopting time/area restrictions to reduce adverse impacts on marine mammals. In completing	The Navy's alternatives were developed in order to satisfy the Navy's purpose and need related to fulfilling its Title 10 requirements. The feasibility of an alternative does not lie in the fact that it can be done or tolerated in the short term. The Navy only selected alternatives that will adequately meet its training and testing requirements over the next 5-year term. The Navy has

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
		its EIS, the Navy must thoroughly analyze a range of alternatives involving varying levels of restrictions in sensitive marine habitat "to permit informed public comment on" not only the agencies' preferred course of action, but also "any choices or alternatives that might be pursued with less environmental harm." Lands Council, 395 F.3d at 1027.	included a robust suite of mitigation measures, which will be implemented in both action alternatives (i.e., whichever alternative is selected). These mitigation measures, as well as standard operating procedures that the Navy routinely employs, are discussed in detail and specifically inform the decision maker and the public how the Navy can avoid or minimize adverse impacts. Details regarding the development of reasonable alternatives are provided in Section 2.4 (Action Alternative Development).
56	Organization: O04-04	(We urge the Navy to provide more information on its preferred alternative, which otherwise, based on the information presented in the DEIS, appears to have been designed on the basis of factors unrelated to avoiding or minimizing adverse impacts. To satisfy NEPA, the Navy should develop a fuller range of reasonable alternatives, such as by considering enhancements to its proposed time-area management measures.) Unfortunately, rather than strive for the most precautionary protections and build upon the time-area management tools shown to be feasible during the previous permitting cycle, in many cases the Navy has elected to weaken its protections... areas of geographic importance for marine mammals for which Mitigation Areas should be considered.	The Navy has worked collaboratively with NMFS to develop mitigation areas using inputs from the operational community, the best available science discussed in Chapter 3 (Affected Environment and Environmental Consequences). The Navy completed an extensive biological assessment and operational analysis (based on a detailed and lengthy review by training experts and leadership responsible for meeting statutory readiness requirements) of potential mitigation areas throughout the entire Study Area. The mitigation areas evaluated in Appendix K (Geographic Mitigation Assessment) and further discussed in Section 5.4 (Mitigation Areas to be Implemented) represents the maximum mitigation within the identified mitigation areas that is practicable to implement under the Proposed Action. The Navy believes that the concerns raised by the commenter were already addressed in Appendix K (Geographic Mitigation Assessment). Within that appendix, the Hawaii portion of the HSTT Study Area was covered in Section 5.4.2 (Mitigation Areas for Marine Mammals in the Hawaii Range Complex) and the Southern California portion of the HSTT Study Area was covered in Section 5.4.3 (Mitigation Areas for Marine

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
			Mammals in the Southern California Portion of the Study Area). The cumulative impact of all commenter-proposed mitigation areas and seasonal or temporal restrictions would limit Navy training and testing using sonar and explosives to narrow fragmented timeframes and locations that are not practicable with effective, realistic training and testing. Likewise, these restrictions would have a significant impact on the testing of current systems and the development of new systems. This would deny weapons system program managers and research, testing, and development program managers the flexibility to rapidly field or develop necessary systems due to the required use of multiple areas within limited timeframes. Therefore, implementing additional mitigation areas beyond what has been analyzed in Appendix K (Geographic Mitigation Assessment) and described in Section 5.4 (Mitigation Areas to be Implemented) would be impracticable and would prevent the Navy from meeting its Title 10 requirements to successfully accomplish military readiness objectives. The Navy's mitigation measures were reviewed and approved by a four-star Admiral, the Fleet Commander of all Navy forces in the Study Area, the Navy Senior Leadership; therefore, additional permission or authorization from Navy Leadership prior to conducting training or testing in the Study Area would be redundant. Additional information regarding the operational importance, significant negative impacts on Navy training and testing operations, and impracticability of implementing the mitigation area proposed by commenter in each geographic region mentioned is provided in the responses that follow as well as in Chapter 5 (Mitigation) of the EIS/OEIS.

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
57	Organization: O04-05	Evaluation of proposed mitigation areas a. Southern California portion of the HSTT Study Area i. San Diego Arc Planning Awareness Area (Jun 1 – Oct 31) Recommendations 1. Extend the seasonality of the San Diego Arc Planning Awareness Area to June 1 to December 31	Analysis of the San Diego Arc and its consideration for additional geographic mitigation is provided in the EIS/OEIS in Appendix K, Section K.4.1.6 (San Diego [Arc] Blue Whale Feeding Area; Settlement Areas 3-A through 3-C, California Coastal Commission 3 NM Shore Area, and San Diego Arc Area), Section K.5.5 (Settlement Areas within the Southern California Portion of the HSTT Study Area), and Section K.6.2 (San Diego Arc: Area Parallel to the Coastline from the Gulf of California Border to just North of Del Mar). This analysis included consideration of seasonality and the potential effectiveness of restrictions to use of mid-frequency active sonar by Navy in the area. Based on the Appendix K analyses, the Navy plans to implement additional mitigation within the San Diego Arc, as detailed in Section 5.4.3 (Mitigation Areas for Marine Mammals in the Southern California Portion of the Study Area), to further avoid or reduce impacts on marine mammals from acoustic and explosive stressors and vessel strikes from Navy training and testing in this location. Regarding the proposed increase in seasonality to December 31, the San Diego Arc and current seasonality was established by NMFS during its Biologically Important Area designation process. While blue whale calls have been detected in Southern California through December (Rice et al., 2017, Lewis & Širović in press), given a large propagation range (10–50 km or more) for low-frequency blue whale vocalization, blue whale call detection from a Navy-funded single passive acoustic device near the San Diego Arc may not be a direct correlation with blue whale presence within the Arc from November through December. In addition, passive acoustic call detection data does not currently allow for direct abundance estimates. Calls may indicate

Table H-3: Comment Response Matrix (continued)

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			some level of blue whale presence, but not abundance or individual residency time. In the most recent Navy-funded passive acoustic monitoring report including the one site in the northern San Diego Arc from June 2015 to April 2016, blue whale call detection frequency near the San Diego Arc starts declining in November after an October peak (Rice et al., 2017, Širović, personal communication). The newest Navy-funded research on blue whale movements from 2014 to 2017 along the U.S. West Coast based on satellite tagging has shown that individual blue whale movement is wide ranging with large distances covered daily (Mate et al., 2017). Nineteen (19) blue whales were tagged in 2016, the most recent reporting year available (Mate et al., 2017). Only 5 of the 19 blue whales spent time in the Southern California Range Complex portion of HSTT, and only spent a few days within the range complex (2–13 days). Average distance from shore for blue whales was 113 km. None of the 19 blue whales tagged in 2016 spent time within the San Diego Arc. From previous year efforts (2014–2015), only a few tagged blue whales passed through the San Diego Arc. In addition, Navy and non-Navy-funded blue whale satellite tagging studies started in the early 1990s and has continued irregularly through 2017. In general, most blue whales start a south-bound migration from the "summer foraging areas" in the mid- to late-fall time period, unless food has not been plentiful, which can lead to a much earlier migration south. Therefore, while blue whales have been documented within the San Diego Arc previously, individual use of the area is variable, likely of short duration, and declining after October. Considering the newest passive acoustic and satellite tagging data, there

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
			is no scientific justification for extending the NMFS designated San Diego Arc period from October 31 to December 31.
58	Organization: O04-06	2. Limit all MFAS within the San Diego Arc Planning Awareness Area	Appendix K discusses the Navy's analysis of mid-frequency active sonar restrictions within the San Diego Arc. Other training mid-frequency active sonar (MFAS) systems are likely to be used less frequently in the vicinity of the San Diego Arc than surface ship mid-frequency active sonars. Given water depths, the San Diego Arc area is not conducive for large scale anti-submarine warfare exercises, nor near areas where other anti-submarine warfare training and testing occurs. Due to the presence of existing Navy subareas in the southern part of the San Diego Arc, a limited amount of helicopter dipping MFAS could occur. These designated range areas are required for proximity to airfields in San Diego such as Naval Air Station North Island and for airspace management. However, helicopters only used these areas in the Arc for a Kilo Dip. A Kilo Dip is a functional check of approximately 1-2 pings of active sonar to confirm the system is operational before the helicopter heads to more remote offshore training areas. This ensures proper system operation and avoids loss of limited training time, expenditure of fuel, and cumulative engine use in the event of equipment malfunction. The potential effects of dipping sonar have been accounted for in the Navy's analysis. Further, due to lower power settings for dipping sonar, potential impact ranges of dipping sonar are significantly lower than surface ship sonars. For example, the HSTT average modeled range to temporary threshold shift of dipping sonar for a 1-second

Table H-3: Comment Response Matrix (continued)

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			ping on low-frequency cetacean (i.e., blue whale) is 77 m (HSTT Draft EIS/OEIS Table 3.7-7). This range is easily monitored for large whales by a hovering helicopter and is accounted for in the Navy's proposed mitigation ranges for dipping sonars. Limited ping time and lower power settings therefore would limit the impact from dipping sonar to any marine mammal species. During a Kilo Dip or any other use of MFAS, the Navy will implement the procedural mitigation as described in Section 5.3.2.1 (Active Sonar). It should be pointed out that the commenter's recommendation is based on new Navy funded behavioral response research specific to beaked whales (Falcone et al., 2017). The Navy relied upon the best science that was available to develop behavioral response functions in consultation with NMFS for the Draft EIS/EIS. The article cited in the comment (Falcone et al., 2017) was not available at the time the Draft EIS/OEIS was published. The new information and data presented in the article was thoroughly reviewed when it became available and further considered in discussions with some of the paper's authors. Many of the confounding variables requiring further analysis for beaked whales and dipping sonar impact assessment are still being researched under continued Navy funding through 2019. The small portion of designated Kilo Dip areas that overlap the southern part of the San Diego Arc are not of sufficient depth for preferred habitat of beaked whales (see Figure 2.1-9 in the HSTT Draft EIS/OEIS). Furthermore, the research conducted by Falcone et al. (2017) was focused exclusively on beaked

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
			whales and cannot be scientifically extended to blue whales or any other species, whose reactions (or lack of reactions) to dipping sonar could be completely different. Passive acoustic monitoring for the past several years in the San Diego Arc confirms a lack of beaked whale detections in the San Diego Arc (Rice et al., 2017). Finally, Navy-funded behavioral response studies of blue whales to simulated surface ship MFAS demonstrated there are distinct individual variations as well as strong behavioral state considerations that influence any response or lack of response (Goldbogen et al., 2013). Navy-funded satellite tracking of blue whales in Southern California and along the US West Coast from 2014–2017 documented extensive daily movements by individual blue whales (Oregon State University, personal communication). 83 blue whales were tagged during this project representing approximately 5% of the entire Eastern Pacific blue whale stock. While variable by year, average individual blue whale daily movement ranged from 25–44 miles per day. Use of the San Diego Arc by blue whales also varied by year. Out of 21 whales tagged in 2014, 14 traveled through the Arc. However, individuals stayed within the Arc <1 to no more than 3.4 days. Only 9 of 22 blue whales traveled through the Arc in 2015 (<1-3 days), no blue whales traveled through the Arc in 2016, and only one blue whale traveled through the Arc in 2017 (<0.3 days). In conclusion, given the infrequent use of and low residency within the Arc as well as high degree of daily movement, the increased sightability of these large baleen whales especially if foraging, less frequent use of

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
			the San Diego Arc by other lower-powered short-duration Navy MFAS systems, low use of the Arc for more intensive surface ship sonar events, existing Navy mitigations for all sonar systems, and proposed geographic limitations for the more impactful surface ship sonar, further MFAS restrictions in the San Diego Arc are not warranted.
59	Organization: O04-07	In making recommendations concerning the San Diego Arc Planning Awareness Area, and for other mitigation areas addressed in these comments, we do not intend to imply that associated mitigation measures should be applied only within the proposed area boundaries. As noted at section III.B.3, the Navy should carefully consider stand-off distances and other measures for activities that, while taking place outside the mitigation areas, would nonetheless ensonify them at levels causing injury or increasing the risk or severity of behavioral disruption.	The Navy drew the boundaries of these areas to their maximum dimension to give the mitigation areas the broadest scope possible. Navy operators determined that implementing additional mitigation beyond what is described in Section 5.4.3 (Mitigation Areas for Marine Mammals in the Southern California Portion of the Study Area) would be impracticable due to implications for safety, sustainability, and the Navy's ability to continue meeting its Title 10 requirements to successfully accomplish military readiness objectives. Some of the considerations that inform why it would be impracticable to implement additional mitigation in the HSTT Study Area are provided below. The Navy conducts training and testing in Southern California because this region provides valuable access to air and sea space conditions that are analogous to areas where the Navy operates, or may need to operate in the future. This contributes to ensuring safety of personnel, skill proficiency, and validation of testing program requirements. For training and testing, areas in this region where exercises are scheduled to occur are chosen to allow for the realistic tactical development of the myriad of training and testing scenarios that Navy units are required to execute prior to operational employment. Certain activities, such as deployment certification exercises using integrated warfare

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
			components, require large areas of the littorals and open ocean for realistic and safe training. Locations for other training and testing activities are chosen due to the proximity of associated training and testing ranges and operating areas (e.g., SOAR), available airspace (e.g., W-291), unobstructed sea space, aircraft emergency landing fields (e.g., San Clemente Island), and with consideration for public safety (e.g., avoiding areas popular for recreational boating). Further restrictions in this area (e.g., further restricting the number of major training exercises or seasonal restrictions on major training exercises based on predicted density of marine mammal species, such as blue whales) for mitigation would be impracticable to implement and would significantly impact the scheduling, training, and certifications required to prepare naval forces for deployment. It would be impracticable to implement seasonal or temporal restrictions for all training and testing in the HSTT Study Area because training and testing schedules are based on national tasking, the number and duration of training cycles identified in the Optimized Fleet Response Plan and various training plans, and forecasting of future testing requirements (including emerging requirements). Although the Navy has the ability to restrict training and testing in certain portions of the HSTT Study Area, as identified in Section 5.4.3 (Mitigation Areas to be Implemented), the Navy is unable to prohibit all major training exercises in this area because it provides unique air and sea conditions necessary to meet operational requirements. Additionally, major training exercise locations may have to change during an exercise, or in exercise planning, based on an assessment of the

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
			performance of the units, or due to other conditions such as weather and mechanical issues, which precludes the ability to prohibit major training exercises from occurring in this area.
60	Organization: O04-08	ii. San Diego Arc Cautionary Area (Jun 1 – Oct 31) Recommendations: 1. Extend the seasonality of the San Diego Arc Cautionary Area to June 1st to December 31st	Analysis of the San Diego Arc and its consideration for additional geographic mitigation was provided in the Draft EIS/OEIS in Appendix K, Section K.4.1.6 (San Diego (Arc) Blue Whale Feeding Area; Settlement Areas 3-A through 3-C, California Coastal Commission 3 NM Shore Area, and San Diego Arc Area), Section K.5.5 (Settlement Areas within the Southern California Portion of the HSTT Study Area), and Section K.6.2 (San Diego Arc: Area Parallel to the Coastline from the Gulf of California Border to just North of Del Mar). This analysis included consideration of seasonality and the potential effectiveness of restrictions to use of mid-frequency active sonar by Navy in the area. Based on the Appendix K (Geographic Mitigation Assessment) analyses, the Navy will implement additional mitigation within the San Diego Arc, as detailed in Section 5.4.3 (Mitigation Areas for Marine Mammals in the Southern California Portion of the Study Area), to further avoid or reduce impacts on marine mammals from acoustic and explosive stressors and vessel strikes from Navy training and testing in this location. Regarding the older citations providing the basis in the comment specifically over the concern for blue whales, see the Draft EIS/OEIS and specifically Section 3.7.2.2.2.3 (Population Trends) regarding the discussion of blue whale based on more recent research indicating that the population in the HSTT Study Area may have recovered and has been stable (see Campbell et al., 2015; Carretta et al., 2015; Monnahan, 2013;

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
			Monnahan et al., 2014; Širović et al., 2015b; Smultea and Jefferson 2014). Seasonality- In regards to the proposed increase in seasonality to December 31 put forth by the comment, the Navy would point out that the San Diego Arc and current seasonality was established by NMFS during its Biologically Important Area designation process. While blue whale calls have been detected in Southern California through December (Rice et al., 2017, Lewis & Širović in press), given a large propagation range (10–50 km or more) for low-frequency blue whale vocalization, blue whale call detection from a Navy-funded single passive acoustic device near the San Diego Arc may not be a direct correlation with presence within the Arc during time periods from November through December. In addition, passive acoustic call detection data does not currently allow for direct abundance estimates. Calls may indicate some level of blue whale presence, but not abundance or individual residency time. In the most recent Navy-funded passive acoustic monitoring report including the one site in the northern San Diego Arc from June 2015-April 2016, blue whale call detection frequency near the San Diego Arc starts declining in November after an October peak (Rice et al., 2017, Širović, personal communication). The newest Navy-funded research on blue whale movements from 2014 to 2017 along the U.S. West Coast based on satellite tagging has shown that individual blue whale movement is wide ranging with large distances covered daily (Mate et al., 2017). Nineteen (19) blue whales were tagged in 2016, the most recent reporting year available (Mate et al., 2017). Only 5 of the 19 blue whales spent time in the Southern California Range Complex portion of HSTT, and

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
			only spent a few days within the range complex (2–13 days). Average distance from shore for blue whales was 113 km. None of the 19 blue whales tagged in 2016 spent time within the San Diego Arc. From previous year efforts (2014–2015), only a few tagged blue whales passed through the San Diego Arc. In addition, Navy and non-Navy-funded blue whale satellite tagging studies started in the early 1990s and has continued irregularly through 2017. In general, most blue whales start a south-bound migration from the "summer foraging areas" in the mid- to late-fall time period, unless food has not been plentiful, which can lead to a much earlier migration south. Migrations tend to be mostly straight line transits to southern Baja or farther south off the coast of Central America, where whales can continue to feed at a lower level of success to supplement their annual energy needs (Mate et al., 2017, 2016, 2015). Therefore, while blue whales have been documented within the San Diego Arc previously, individual use of the area is variable, likely of short duration, and declining after October. Considering the newest passive acoustic and satellite tagging data, there is no scientific justification for extending the NMFS designated San Diego Arc occurrence period from October 31 to December 31.
61	Organization: O04-09	2. Prohibit use of air-deployed mid-frequency active sonar 3. Restrict other sources of mid-frequency active sonar 4. Prohibit use of low-frequency active sonar	The EIS/OEIS and Appendix K discuss the Navy's analysis of mid-frequency and low-frequency active sonar restrictions within the San Diego Arc. Other sonar systems are likely to be used less frequently in the vicinity of the San Diego Arc than surface ship mid-frequency active sonars. In regard to the recommendation to prohibit "air-deployed" or dipping mid-frequency active sonar, the only helicopter dipping

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
			sonar activity that would likely be conducted in the San Diego Arc area is a Kilo Dip, which occurs relatively infrequently and involves a functional check of approximately 1–2 pings of active sonar before moving offshore beyond the San Diego Arc to conduct the training activity. During use of this sonar, the Navy will implement the procedural mitigation as described in Section 5.3.2.1 (Active Sonar). The Kilo Dip functional check needs to occur close to Naval Air Station North Island in San Diego to insure all systems are functioning properly, before moving offshore. This ensures proper system operation and avoids loss of limited training time, expenditure of fuel, and cumulative engine use in the event of equipment malfunction. The potential effects of dipping sonar have been accounted for in the Navy's analysis. Further, due to lower power settings for dipping sonar, potential behavioral impact ranges of dipping sonar are significantly lower than surface ship sonars. For example, the HSTT average modeled range to temporary threshold shift of dipping sonar for a 1-second ping on low-frequency cetacean (i.e., blue whale) is 77 m (HSTT Draft EIS/OEIS Table 3.7-7). This range is easily monitored for large whales by a hovering helicopter and is accounted for in the Navy's proposed mitigation ranges for dipping sonars. Limited ping time and lower power settings therefore would limit the impact from dipping sonar to any marine mammal species. It should be pointed out that the commenter's recommendation is based on new Navy behavioral response research specific to beaked whales (Falcone et al., 2017). The Navy relied upon the best science that was available to develop behavioral response functions in consultation with NMFS for the Draft EIS/OEIS. The

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
			article cited in the comment (Falcone et al., 2017) was not available at the time the Draft EIS/OEIS was published. The new information and data presented in the article was thoroughly reviewed when it became available and further considered in discussions with some of the paper's authors. Many of the confounding variables requiring further analysis for beaked whales and dipping sonar impact assessment are still being researched under continued Navy funding through 2019. The small portion of designated Kilo Dip areas that overlap the southern part of the San Diego Arc are not of sufficient depth for preferred habitat of beaked whales (see Figure 2.1-9 in the HSTT Draft EIS/OEIS). Further, passive acoustic monitoring for the past several years in the San Diego Arc confirms a lack of beaked whale detections (Rice et al., 2017). Also, behavioral responses of beaked whales from dipping and other sonars cannot be universally applied to other species including blue whales. Navy-funded behavioral response studies of blue whales to simulated surface ship sonar has demonstrated there are distinct individual variations as well as strong behavioral state considerations that influence any response or lack of response (Goldbogen et al., 2013).
62	Organization: O04-10	5. Require vessel speed restrictions within the San Diego Arc Cautionary Area ...the Navy should include restrictions to limit vessel speed within the critical San Diego Arc Cautionary Area, as it has in certain portions of the AFTT.	Previously, the Navy commissioned a vessel density and speed report for HSTT (CNA, 2016). Based on an analysis of Navy ship traffic in the HSTT Study Area between 2011 and 2015, median speed of all Navy vessels within Southern California is typically already low, with median speeds between 5 and 12 knots (CAN, 2016). Slowest speeds occurred closer to the coast including the general area of the San Diego Arc and approaches to San Diego Bay.

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
			The presence and transits of commercial and recreational vessels, numbering in the many hundreds, far outweighs the presence of Navy vessels. Furthermore, blue whale mortality and injuries attributed to commercial ship strikes in California waters was zero in the most recent reporting period between 2011 and 2015 (Carretta et al., 2017a). There has been no confirmed Navy ship strike to a blue whale in the entire Pacific over the 13-year period from 2005 to 2017. Section 3.7.3.4.1 (Impacts from Vessels and In-Water Devices) and Section K.4.1.6.2 (San Diego [Arc] Blue Whale Feeding Area Mitigation Considerations), state the important differences between most Navy vessels and their operation and commercial ships that individually make Navy vessels much less likely to strike a whale. The Navy will implement procedural mitigation for vessel movements based on guidance from NMFS for vessel strike avoidance. The Navy implements certain vessel speed restrictions in the Atlantic Fleet Training and Testing (AFTT) Study Area specifically for the purpose of reducing the potential for vessel strikes of North Atlantic right whales. The Navy can implement these vessel speed restrictions for North Atlantic right whales due to the nature of how the applicable activities are conducted (i.e., the vessel speed restrictions still allow the Navy to meet its mission requirements). When developing the Phase III mitigation, the Navy analyzed the potential for implementing additional types of mitigation, such as developing vessel speed restrictions within the HSTT Study Area. The Navy determined that based on how the training and testing activities will be conducted within the HSTT Study Area under the Proposed Action, vessel

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
			speed restrictions would be incompatible with the practicability assessment criteria for safety, sustainability, and Title 10 requirements, as described in Section 5.3.4.1 (Vessel Movement).
63	Organization: O04-11	iii. Channel Islands Sanctuary Cautionary Area (year-round) Recommendations: 1. Prohibit use of air-deployed mid-frequency active sonar 2. Prohibit other sources of mid-frequency active sonar 3. Prohibit use of low-frequency active sonar	Analysis of the Channel Islands National Marine Sanctuary and consideration for additional geographic mitigation is provided in the Final EIS/OEIS in Section K.6.3 (3 NM Santa Barbara Island Area: Area within 3 NM around Santa Barbara Island within the Channel Islands National Marine Sanctuary). Based on that analysis, the Navy will implement additional mitigation within the Santa Barbara Island Mitigation Area, as detailed in Section 5.4.3 (Mitigation Areas for Marine Mammals in the Southern California Portion of the Study Area), to further avoid or reduce impacts on marine mammals from acoustic and explosive stressors and vessel strikes from the Proposed Action. Appendix K discusses the Navy's analysis of mid-frequency active sonar restrictions around Santa Barbara Island within the Channel Islands National Marine Sanctuary. Other sonar systems are likely to be used less frequently in the vicinity than surface ship mid-frequency active sonars. The comment's request to prohibit "air-deployed" mid-frequency active sonar is based on one paper (Falcone et al., 2017) which is a Navy-funded project designed to study behavioral responses of a single species, Cuvier's beaked whales, to mid-frequency active sonar. The Navy relied upon the best science that was available to develop behavioral response functions for beaked whales and other marine mammals in consultation with NMFS for the Draft EIS/OEIS. The article cited in the comment (Falcone et al., 2017) was not available at the

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
			time the Draft EIS/OEIS was published but does not change the EIS/OEIS criteria or conclusions. The new information and data presented in the article were thoroughly reviewed when they became available and further considered in discussions with some of the paper's authors. Many of the confounding variables requiring further analysis for beaked whales and dipping sonar impact assessment are still being researched under continued Navy funding through 2019. Behavioral responses of beaked whales from dipping and other sonars cannot be universally applied to other marine mammal species. For example, Navy-funded behavioral response studies of blue whales to simulated surface ship sonar has demonstrated there are distinct individual variations as well as strong behavioral state considerations that influence any response or lack of response (Goldbogen et al., 2013). The same conclusion on the importance of exposure and behavioral context was stressed by Harris et al. (2017). Therefore, it is expected that other species would also have highly variable individual responses ranging from some response to no response to any anthropogenic sound. This variability is accounted for in the Navy's current behavioral response curves described in the EIS/OEIS and supporting technical reports. Furthermore, the potential effects of dipping sonar have been rigorously accounted for in the Navy's analysis. Parameters such as power level and propagation range for typical dipping sonar use are factored into HSTT acoustic impact analysis along with guild specific criteria and other modeling variables as detailed in the HSTT Draft EIS/OEIS and associated technical reports for criteria and acoustic modeling. Due to lower power

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
			settings for dipping sonar, potential impact ranges of dipping sonar are significantly lower than surface ship sonars. For example, the HSTT average modeled range to temporary threshold shift of dipping sonar for a 1-second ping on low-frequency cetacean (i.e., blue whale) is 77 m, and for mid-frequency cetaceans including beaked whales is 22 m (HSTT Draft EIS/OEIS Table 3.7-7). This range is monitored for marine mammals by a hovering helicopter and is accounted for in the Navy's proposed mitigation ranges for dipping sonars (200 yd. or 183 m). Limited ping time and lower power settings therefore would limit the impact from dipping sonar to any marine mammal species. The available habitat for beaked whales within the Mitigation Area is much smaller than the total Mitigation Area spatial extent. The relatively small area surrounding the Santa Barbara Island Mitigation Area represents less than 0.08% of the entire HSTT SOCAL area. An even smaller portion of this area meets the scientifically accepted minimum depth criteria expected for beaked whale habitat, in Southern California usually greater than 800 m. The bathymetric area greater than 800 m depth and within the Santa Barbara Island Mitigation Area is approximately 24 square NM (26% of the total Mitigation Area spatial extent or only 0.02% of the total HSTT SOCAL area). Navy-funded monitoring at other locations within SOCAL have shown that even in ocean basins thought to have Cuvier's beaked whale sub-population, there is still quite a bit of variation in occurrence and movement of beaked whales within a given basin (Schorr et al., 2017,2018). For other marine mammal species, the small area around Santa Barbara Island does not have resident

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
			marine mammals, formally identified biologically important areas, nor is it identified as a breeding or persistent foraging location for cetaceans. Instead, the same marine mammals that range throughout the offshore Southern California area could pass at some point through the marine waters of Santa Barbara Island. As discussed in Appendix K, the Navy is already proposing year-round limitations to mid-frequency active sonar and larger explosive use. Other mid-frequency active sonar systems for which the Navy is seeking authorization within SOCAL are used less frequently than surface ship sonars, and more importantly are of much lower power with correspondingly lower propagation ranges and reduced potential behavioral impacts. Therefore, limitation of sonars within this area not previously discussed in Appendix K would not be any more protective to marine mammal populations than existing Navy mitigation measures within the entire SOCAL area. All locations within the HSTT Study Area have been used for Navy training and testing for decades. There has been no scientific evidence to indicate the Navy's activities are having adverse effects on populations of marine mammals, many of which continue to increase in number or are maintaining populations based on what regional conditions can support. This includes any marine mammal population that may transit through the Santa Barbara Island Mitigation Area. For example, the most recent NMFS U.S. West Coast survey findings (Moore and Barlow, 2017) encountered the highest estimated abundance of Mesoplodon beaked whales in the California Current since 1991. Multiple other surveys,

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
			monitoring efforts, and research projects continue to encounter long-term resident individuals such as populations of beaked whales in higher densities within the HSTT Study Area where various sonar systems have been in use for decades; see for example citation in the Draft EIS/OEIS to Debich et al., 2015a; Debich et al., 2015b; Falcone & Schorr, 2012, 2014; Hildebrand et al., 2009; Moretti, 2016; Širović et al., 2016; Smultea & Jefferson, 2014. The newest Navy-funded research not available at the time of the Draft EIS/OEIS continue to support the regular and repeated occurrence of marine mammal populations in HSTT including those thought most susceptible to behavioral response to anthropogenic sounds (Moretti et al., 2017; Širović et al., 2016, 2017, 2018; DiMarzio et al., 2018; Schorr et al., 2018; Širović et al., 2018, Lewis & Širović, in press). Navy research and monitoring funding continues within the HSTT Study Area under current NMFS MMPA and ESA permits, and is planned through the duration of any future permits. Given the lack of effects to marine mammal populations in the HSTT Study Area from surface ship sonars, the effects from intermittent, less frequent use of lower powered dipping mid-frequency active sonar or other mid-frequency active sonar and low-frequency sonars would also not significantly affect local populations. Finally, given the lack of significant individual and population impact to marine species throughout Southern California from Navy activities, lack of significant and repeated use of the small portion of waters within the Santa Barbara Island Mitigation Area by marine mammals, anticipated low individual residency times within the Mitigation Area, application

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
			of mitigation and protective measures as outlined in the Draft EIS/OEIS, documented safe speeds Navy vessels already navigate by, detailed assessments of realistic training and testing requirements and potential impacts of further restrictions, the Navy has adequately defined the most practical limitations in the HSTT Draft EIS/OEIS.
64	Organization: O04-12	4. Implement vessel speed restrictions in the Channel Islands Sanctuary Cautionary Area	Additional Navy-only speed restrictions within the Channel Islands Sanctuary Cautionary Area (renamed the Santa Barbara Island Mitigation Area) are not warranted. There has not been any Navy ship strike to marine mammals in SOCAL over the 8-year period from 2010 to 2018, and there has never been a Navy strike within the boundary of the Channel Islands National Marine Sanctuary over the course of strike record collection dating back 20 years. Therefore, ship strike risk to marine mammals transiting the Santa Barbara Island Mitigation Area is minimal. Additionally, as detailed in the analysis in the Draft EIS/OEIS Section 3.7.3.4.1 (Impacts from Vessels and In-Water Devices) and in Appendix K (Geographic Mitigation Assessment), there are important differences between most Navy vessels and their operation and commercial ships that individually make Navy vessels much less likely to strike a whale. Navy vessels already operate at a safe speed given a particular transit or activity need. This also includes a provision to avoid large whales by 500 yards; so long as safety of navigation and safety of operations is maintained. Previously, the Navy commissioned a vessel density and speed report for HSTT (CNA, 2016). Based on an analysis of Navy ship traffic in HSTT between 2011 and 2015, the average speed of all Navy vessels within Southern California is typically already low, with median speeds between 5 and 12 knots (CNA, 2016). Slowest

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
			speeds occurred closer to the coast and islands. However, sometimes during training or testing activities, higher speeds are required. All locations within the HSTT Study Area have been used for Navy training and testing for decades. There has been no scientific evidence to indicate the Navy's activities are having adverse effects on populations of marine mammals, many of which continue to increase in number or are maintaining populations based on what regional conditions can support. This includes any marine mammal population that may transit through the Santa Barbara Island Mitigation Area. For example, the most recent NMFS U.S. West Coast survey findings (Moore and Barlow 2017) encountered the highest estimated abundance of Mesoplodon beaked whales in the California Current since 1991. Multiple other surveys, monitoring efforts, and research projects continue to encounter long-term resident individuals such as populations of beaked whales in higher densities within HSTT where various sonar systems have been in use for decades; see for example citation in the Draft EIS/OEIS to Debich et al., 2015a; Debich et al., 2015b; Falcone & Schorr, 2012, 2014; Hildebrand et al., 2009; Moretti, 2016; Širović et al., 2016; Smultea & Jefferson, 2014. The newest Navy-funded research not available at the time of the Draft EIS/OEIS continue to support the regular and repeated occurrence of marine mammal populations in HSTT including those thought most susceptible to behavioral response to anthropogenic sounds (Moretti et al., 2017; Širović et al., 2016, 2017, 2018; DiMarzio et al., 2018; Schorr et al., 2018; Širović et al., 2018, Lewis & Širović, in press). Navy research and monitoring funding continues within the HSTT Study Area under current

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
			NMFS MMPA and ESA permits, and is planned through the duration of any future permits. Given the lack of effects to marine mammal populations in HSTT from surface ship sonars, the effects from intermittent, less frequent use of lower-powered dipping mid-frequency active sonar or other mid-frequency active sonar and low-frequency sonars would also not significantly affect local populations. Finally, given the lack of significant population impact to marine species throughout Southern California from Navy activities, lack of significant and repeated use of the small portion of waters within the Santa Barbara Island Mitigation Area by marine mammals, anticipated low individual residency times within the Mitigation Area, application of mitigation and protective measures as outlined in the Draft EIS/OEIS, documented safe speeds Navy vessels already navigate by, detailed assessments of realistic training and testing requirements and potential impacts of further restrictions, the Navy has adequately defined the most practical in the HSTT Draft EIS/OEIS and Appendix K (Geographic Mitigation Assessment).
65	Organization: O04-13	b. Hawai'ian portion of the HSTT Study Area i. West-Side Hawai'i Island Planning Awareness Area (year-round) Recommendations 1. Expand the West-Side Hawai'i Island Planning Awareness Area westward to protect resident Cuvier's beaked whales and rough-toothed dolphins	Analyses of the marine mammal species mentioned in the comment and considered within the Hawaii Island Mitigation Area (which includes the formerly named West-side Hawaii Island Cautionary Area and West-Side Hawaii Island Planning Awareness Area) for additional geographic mitigation are discussed throughout Section K.3 (Biologically Important Areas within the Hawaii Range Complex Portion of the HSTT Study Area) and Sections K.5.1 (Settlement Areas Within the Hawaii Portion of the HSTT Study Area) through K.5.4 (Proposed Mitigation Areas that Overlap the Hawaii Portion of the

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
			HSTT Settlement Agreement Areas) regarding the analysis of Settlement Areas within the Hawaii portion of the HSTT Study Area. Additional information on the marine mammals mentioned in the comment is also provided in the species-specific sub-sections in Section 3.7.2 (Affected Environment). Based on these analyses, the Navy will implement additional mitigation within the Hawaii Island Mitigation Area (year-round) as detailed in Section 5.4.2 (Mitigation Areas for Marine Mammals in the Hawaii Range Complex), to further avoid or reduce impacts on marine mammals from acoustic and explosive stressors from the Proposed Action. Long-term and relatively comprehensive research has found no evidence of any apparent effects while documenting the continued existence of multiple small and resident populations of various species as well as long-term residency by individual beaked whales spanning the length of the current studies that exceed a decade. Further, the Navy has considered research showing that in specific contexts (such as associated with urban noise, commercial vessel traffic, eco-tourism, or whale watching, Section 3.7.2.1.5.2 [Commercial Industries]) that chronic repeated displacement and foraging disruption of populations with residency or high site fidelity can result in population-level effects. As also detailed in the EIS/OEIS, however, the proposed Navy training and testing activities do not equate with the types of disturbance in this body of research, nor do they rise to the level of chronic disturbance where such effects have been demonstrated because Navy activities are typically sporadic and dispersed. There is no evidence to suggest there have been any population-level effects in the waters around Oahu, Kauai, and

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
			Niihau or anywhere in the HSTT Study Area. In the waters around Oahu, Kauai, and Niihau, documented long-term residency by individuals and the existence of multiple small and resident populations are precisely where Navy training and testing have been occurring for decades, strongly suggesting a lack of significant impact to those individuals and populations from the continuation of Navy training and testing. As for increasing the size of the Hawaii Island Mitigation Area to protect resident Cuvier's beaked whales and rough-toothed dolphins, only the northern portion of the Cuvier's beaked whale biologically important area in Alenuihaha Channel and a smaller offshore portion of the biologically important area west of Hawaii are not covered by mitigations included in the Hawaii Mitigation Area on the west and east of Hawaii Island. The biologically important area is based on the known range of the island-associated population, and the authors suggest that "the range of individuals from this population is likely to increase as additional satellite-tag data become available" (Baird et al., 2015b). Cuvier's beaked whales are not expected to be displaced from their habitat due to training and testing activities further offshore in these small areas of the biologically important area, given that the biologically important area covers 23,583 km^2, is unbroken and continuous surrounding the island, and the biologically important area likely underrepresents their range. The small portion of the biologically important area that does not overlap the Hawaii Island Mitigation Area is offshore, and according to the most recent stock assessment approximately 95% of all sighting locations were within 45 km of shore. Additionally, consequences to

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
			individuals or populations are not unknown. The Navy has modeled no PTS and small numbers of TTS and behavioral takes for Cuvier's beaked whales across the entire Hawaii portion of the Study Area due to acoustic stressors. Most of the TTS and behavioral takes for Cuvier's beaked whales are associated with testing in the Hawaii Temporary Operating Area, impacting the pelagic population (see Figure 3.7-36). It is extremely unlikely that any modeled takes would be of individuals in this small portion of the biologically important area that extends outside the Mitigation Area. Mark-recapture estimates derived from photographs of rough-toothed dolphins taken between 2003 and 2006 resulted in a small and resident population estimate of 198 around the island of Hawaii (Baird et al. 2008), but those surveys were conducted primarily with 40 km of shore and may underestimate the population. Data do suggest high site fidelity and low population size for the island-associated population. There are no tagging data to provide information about the range of the island-associated population; the biologically important area is based on sighting locations and encompasses 7,175 km^2. Generally, this species is typically found close to shore around oceanic islands. Only approximately half of the biologically important area offshore is not covered by the proposed Mitigation Area, where the biologically important area overlaps with special use airspace. Consequences to individuals or populations are not unknown. The Navy acoustic model resulted in no PTS and some TTS and behavioral takes due to acoustic stressors for this species across the entire Study Area (see Figure 3.7-66). Significant impacts on rough-toothed dolphin natural behaviors or abandonment due to

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
			training with sonar and other transducers are unlikely to occur within the small and resident population area. A few minor to moderate TTS or behavioral reactions to an individual over the course of a year are unlikely to have any significant costs or long-term consequences for that individual, and nothing in the proposed action is expected to cause a "catastrophic event." The Navy operating areas west of Hawaii Island are used commonly for larger events for a variety of reasons described further in Section K.3 (Biologically Important Areas Within the Hawaiian Range Complex Portion of the HSTT Study Area) (e.g., the relatively large group of seamounts in the open ocean offers challenging bathymetry in the open ocean far away from civilian vessel traffic and air lanes where ships, submarines, and aircraft are completely free to maneuver) and sonar may be used by a variety of platforms. Given that enlarging the Mitigation Area is not anticipated to realistically reduce adverse impacts, expanding the mitigation area doesn't meet Navy's criteria of being biologically effective to the extent that it is balanced with the importance of these open ocean operating areas for training and testing.
66	Organization: O04-14	b. Hawai'ian portion of the HSTT Study Area i. West-Side Hawai'i Island Planning Awareness Area (year-round) Recommendations 2. Limit major training exercises to reduce cumulative exposure	Prohibiting major training exercises outright or spatially separating them within the Hawaii Island Mitigation Area (which includes the formerly named Planning Awareness Area) was proposed as additional mitigation to ensure that "marine mammal populations with highly discrete site fidelity…are not exposed to multiple major training exercises within a single year." The goal of geographic mitigation is not to be an absolute, outright barrier and stop exposing animals to exercises per se; it is to reduce adverse impacts to the maximum extent practicable.

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
			Impacts associated with major training exercises, including cumulative impacts, are addressed in Chapters 3 (Affected Environment and Environmental Consequences) and 4 (Cumulative Impacts), and Navy quantitative analysis using the best available science has determined that training and testing activities will not have population-level impacts on any species. As determined in Section 3.7.4 (Summary of Potential Impacts on Marine Mammals), it is not anticipated that the Proposed Action will result in significant impacts to marine mammals. To date, the findings from research and monitoring and the regulatory conclusions from previous analyses by NMFS are that the majority of impacts from Navy training and testing activities are not expected to have deleterious impacts on the fitness of any individuals or long-term consequences to populations of marine mammals. Major training exercises cannot be moved around within the Hawaii Mitigation Area, given that those activities are specifically located to leverage particular features like the Alenuihaha Channel and the approaches to Kawaihae Harbor. This proposed geographic mitigation does not meet the Navy's criteria of being biologically effective to the extent that it is balanced with the importance of these open ocean operating areas for training and testing.
67	Organization: O04-15	ii. West-Side Hawai'i Island Cautionary Area (year-round) Recommendations 1. Prohibit use of air-deployed mid-frequency active sonar	Analyses of the marine mammal species mentioned in the comment and considered within the Hawaii Island Mitigation Area (which includes the formerly named West-side Hawaii Island Cautionary Area) are discussed in Section K.3 (Biologically Important Areas within the Hawaii Range Complex Portion of the Study Area) and Sections K.5.1 (Settlement Areas Within the Hawaii

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
			Portion of the HSTT Study Area) through K.5.4 (Proposed Mitigation Areas that Overlap the Hawaii Portion of the HSTT Settlement Agreement Areas). Additional information on the marine mammals mentioned in the comment is also provided in the species-specific subsections in Section 3.7.2 (Affected Environment). Based on these analyses, the Navy will implement additional mitigation within the Hawaii Island Mitigation Area (year-round) as detailed in Section 5.4.2 (Mitigation Areas for Marine Mammals in the Hawaii Range Complex), to further avoid or reduce impacts on marine mammals from acoustic and explosive stressors and vessel strikes from the Proposed Action. Among these new measures is a limit to the annual use of helicopter dipping sonar. Appendix K (Geographic Mitigation Assessment) in the EIS/OEIS discusses the Navy's analysis of further mid-frequency active sonar restrictions in the near- and off-shore areas of Hawaii Island. Other sonar systems are likely to be used less frequently in the vicinity than surface ship mid-frequency active sonars. Other mid-frequency active sonar systems for which the Navy is seeking authorization within the HSTT Study Area are used less frequently than surface ship sonars, and are of much lower power with correspondingly lower propagation ranges and reduced potential behavioral impacts. Therefore, limitation of sonars within this area not currently discussed in Appendix K would not be any more protective to marine mammal populations than existing Navy mitigation measures within the Study Area. The comment's request to prohibit "air-deployed" mid-frequency active sonar is based on one paper (Falcone et al., 2017), which is a Navy-funded project designed to

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
			study behavioral responses of a single species, Cuvier's beaked whales, to mid-frequency active sonar. The Navy relied upon the best science that was available to develop behavioral response functions for beaked whales and other marine mammals in consultation with NMFS for the Draft EIS/OEIS. The article cited in the comment (Falcone et al., 2017) was not available at the time the Draft EIS/OEIS was published but does not change the EIS/OEIS criteria or conclusions. The new information and data presented in the article was thoroughly reviewed when it became available and further considered in discussions with some of the paper's authors. Many of the confounding variables requiring further analysis for beaked whales and dipping sonar impact assessment are still being researched under continued Navy funding through 2019. However, as mentioned above, the Navy is proposing new mitigation that includes a limit to the annual use of helicopter dipping sonar in the Hawaii Island Mitigation Area. Behavioral responses of beaked whales from dipping and other sonars cannot be universally applied to other marine mammal species. For example, Navy-funded behavioral response studies of blue whales to simulated surface ship sonar has demonstrated there are distinct individual variations as well as strong behavioral state considerations that influence any response or lack of response (Goldbogen et al., 2013). The same conclusion on the importance of exposure and behavioral context was stressed by Harris et al. (2017). Therefore, it is expected that other species would also have highly variable individual responses ranging from some response to no response to any anthropogenic sound.

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
			This variability is accounted for in the Navy's current behavioral response curves described in the Draft EIS/OEIS and supporting technical reports. Furthermore, the potential effects of dipping sonar have been rigorously accounted for in the Navy's analysis. Parameters such as power level and propagation range for typical dipping sonar use are factored into HSTT acoustic impact analysis along with guild-specific criteria and other modeling variables as detailed in the Draft EIS/OEIS and associated technical reports for criteria and acoustic modeling. Further, due to lower power settings for dipping sonar, potential impact ranges of dipping sonar are significantly lower than surface ship sonars. For example, the HSTT average modeled range to temporary threshold shift of dipping sonar for a 1-second ping on low-frequency cetacean (i.e., blue whale) is 77 m, and for mid-frequency cetaceans including beaked whales is 22 m (HSTT Draft EIS/OEIS Table 3.7-7). This range is easily monitored for marine mammals by a hovering helicopter and is accounted for in the Navy's proposed mitigation ranges for dipping sonars (200 yd. or 183 m). Limited ping time (i.e., less dipping sonar use as compared to typical surface ship sonar use) and lower power settings therefore would limit the impact from dipping sonar to any marine mammal species.
68	Organization: O04-16	ii. West-Side Hawai'i Island Cautionary Area (year-round) Recommendations 2. Prohibit other sources of mid-frequency active sonar	All locations within the HSTT Study Area have been used for Navy training and testing for decades. There has been no scientific evidence to indicate the Navy's activities are having adverse effects on populations of marine mammals, many of which continue to increase in number or are maintaining populations based on what regional conditions can support. Navy research and monitoring funding continues within the HSTT Study

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
			Area under current NMFS MMPA and ESA permits, and is planned through the duration of any future permits. Given the lack of effects to marine mammal populations in the HSTT Study Area from larger, more powerful surface ship sonars, the effects from intermittent, less frequent use of lower powered mid-frequency dipping sonar or other mid-frequency active sonars would also not significantly affect small and resident populations. However, the Navy is proposing new mitigation that includes a limit to the annual use of helicopter dipping sonar in the Hawaii Island Mitigation Area.
69	Organization: O04-17	iii. East-Side Hawai'i Island Cautionary Area (year-round) Recommendations 1. Prohibit use of air-deployed mid-frequency active sonar 2. Prohibit other sources of mid-frequency active sonar	Analyses of the marine mammal species mentioned in the comment and considered within the Hawaii Island Mitigation Area (which includes the formerly named East-side Hawaii Island Cautionary Area) are discussed throughout Section K.3 (Biologically Important Areas within the Hawaii Range Complex Portion of the HSTT Study Area) and Sections K.5.1 (Settlement Areas Within the Hawaii Portion of the HSTT Study Area) through K.5.4 (Proposed Mitigation Areas that Overlap the Hawaii Portion of the HSTT Settlement Agreement Areas). Additional information on the marine mammals mentioned in the comment is also provided in the species-specific sub-sections in Section 3.7.2 (Affected Environment). Based on these analyses, the Navy will implement additional mitigation within the Hawaii Island Mitigation Area, which includes limits to the amount of surface ship hull-mounted mid-frequency active sonar and dipping sonar during all training and testing, and the prohibition of explosives that would potentially result in the take of marine mammals during training and testing (year-round) as detailed in Section 5.4.2 (Mitigation Areas for Marine Mammals in the Hawaii Range

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
			Complex). These mitigation measures are likely to result in an avoidance or reduction of impacts from active sonar and explosives from the Proposed Action.
70	Organization: O04-18	iv. Humpback Whale Cautionary Area (Nov 15-April 15) Recommendations 1. Extend the Humpback Whale Cautionary Area west to encompass the Humpback Whale Special Reporting Area in Kaiwi Channel The Humpback Whale Special Reporting Area in Kaiwi Channel encompasses important seasonal humpback whale breeding whale habitat (including the Hawaiian Islands Humpback Whale National Marine Sanctuary and part of the "Oʻahu, Molokaʻi, Lānaʻi, and Maui" breeding BIA) and an important year-round habitat area for the Main Hawaiian Islands insular population of false killer whales. The geographic boundaries of the Humpback Whale Cautionary Area should be extended to encompass the Special Reporting Area in Kaiwi Channel.	The portion of the special reporting area that extends into Kaiwi Channel over Penguin Bank (equivalent to settlement area 2A) is generally not a higher use area for Main Hawaiian Island Insular False Killer Whales and does not overlap significantly with the biologically important area. As presented in Chapter 3 (Affected Environment and Environmental Consequences), Navy quantitative analysis indicates that significant impacts on false killer whale natural behaviors or abandonment due to training with sonar and other transducers are unlikely to occur within the entire small and resident population area, let alone in the small sub-portion of the biologically important area that overlaps the proposed extension. Additionally, most of the modeled takes are for the Hawaii pelagic population of false killer whale (see Figure 3.7-46 and Table 3.7-31).
71	Organization: O04-19	iv. Humpback Whale Cautionary Area (Nov 15–April 15) Recommendations 2. Extend to year-round restrictions in the extended portion of the Humpback Whale Cautionary Area and the proposed extension into the Kaiwi Channel Humpback Whale Special Reporting Area The Humpback Whale Special Reporting Area in Kaiwi Channel encompasses important seasonal humpback whale breeding whale habitat (including the Hawaiian Islands Humpback Whale National Marine Sanctuary and part of the "Oʻahu, Molokaʻi, Lānaʻi, and Maui" breeding BIA) and an important year-round habitat area for the Main Hawaiian Islands insular population of false killer whales. The geographic boundaries of the Humpback	The Navy has renamed the Humpback Whale Cautionary Area to the 4-Islands Mitigation Area. The additional expansion requested in the comment is not expected to reduce adverse impacts to an extent that would outweigh the negative impacts if unit commanders were unable to conduct unit-level training and testing, especially as they pass over Penguin Bank while transiting between Pearl Harbor and other parts of the Study Area. Extending the Mitigation Area's seasonal mid-frequency active sonar restrictions to year-round is not operationally practicable, regardless of whether the Mitigation Area was expanded or not. Prohibiting mid-frequency active sonar would preclude the Submarine Command Course from meeting its objectives and

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
		Whale Cautionary Area should be extended to encompass the Special Reporting Area in Kaiwi Channel.	leveraging the important and unique characteristics of the 4-Islands Region, as described in multiple sections of Appendix K (e.g., Section K.3.1.6 [4-Islands Region and Penguin Bank Humpback Whale Reproduction Area, and Settlement Area 2-A and 2-B]). Penguin Bank is particularly used for shallow water submarine testing and anti-submarine warfare training because of its large expanse of shallow bathymetry. The conditions in Penguin Bank offer ideal bathymetric and oceanographic conditions allowing for realistic training and testing and serve as surrogate environments for active theater locations. Additionally, this mitigation would further increase reporting requirements. As discussed in Section 5.5.7 (Reporting Requirements), the Navy developed its reporting requirements in conjunction with NMFS, balancing the usefulness of the information to be collected with the practicability of collecting it. An increase in reporting requirements as a mitigation would draw the event participants' attentions away from the complex tactical tasks they are primarily obligated to perform (such as driving a warship), which would adversely impact personnel safety, public health and safety, and the effectiveness of the military readiness activity. Expanding the Mitigation Area and extending the restrictions to year-round therefore do not meet the Navy's criteria for geographic mitigation.
72	Organization: O04-20	iv. Humpback Whale Cautionary Area (Nov 15-April 15) Recommendations 3. Implement vessel speed restrictions within the Humpback Whale Cautionary Area	This mitigation measure was proposed to address impacts on humpback whales due to both ship noise and ship strikes. As described and detailed in the Draft EIS, the Navy already implements a number of ship-strike risk reduction measures for all vessels, in all locations and seasons, and for all marine mammal species. The Navy

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
		The Humpback Whale Special Reporting Area in Kaiwi Channel encompasses important seasonal humpback whale breeding whale habitat (including the Hawaiian Islands Humpback Whale National Marine Sanctuary and part of the "Oʻahu, Molokaʻi, Lānaʻi, and Maui" breeding BIA) and an important year-round habitat area for the Main Hawaiian Islands insular population of false killer whales. The geographic boundaries of the Humpback Whale Cautionary Area should be extended to encompass the Special Reporting Area in Kaiwi Channel.	cannot implement mitigation that restricts vessel speed during training or testing in the HSTT Study Area. Vessels must be able to maneuver freely as required by their tactics in order for training events to be effective. Imposition of vessel speed restrictions would interfere with the Navy's ability to complete tests that must occur in specific bathymetric and oceanic conditions and at specific speeds. Navy vessel operators must test and train with vessels in such a manner that ensures their ability to operate vessels as they would in military missions and combat operations (including being able to react to changing tactical situations and evaluate system capabilities). Furthermore, testing of new platforms requires testing at the full range of propulsion capabilities and is required to ensure the delivered platform meets requirements. Based on an analysis of Navy ship traffic in the HSTT Study Area between 2011 and 2015, median speed of all Navy vessels within Hawaii is typically already low, with median speeds between 8-16 knots (CNA, 2016). Speed restrictions in the Cautionary Area (renamed the 4-Islands Region Mitigation Area) are unwarranted given the movement of all social groups throughout the islands outside the Mitigation Area, the current lack of ship strike risk from Navy vessels in Hawaii (2010–2017), the already safe training and testing ship speeds the Navy uses within HSTT, and existing Navy mitigation measures, including provisions to avoid large whales by 500 yards where safe to do so. Implementing speed restrictions in the Mitigation Area does not meet the Navy's criteria of being biologically effective or operationally practicable to implement.

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
			Information on the response of baleen whales to vessel noise is presented in Section 3.7.3.1.1.5 (Behavioral Reactions) and Section 3.7.3.1.5 (Impacts from Vessel Noise). Impacts, if they did occur, would most likely be short-term masking and minor behavioral responses. Therefore, significant impacts on humpback whale reproductive behaviors from vessel noise associated with training activities are not expected. Navy vessels are intentionally designed to be quieter than civilian vessels, and ship speed reductions are not expected to reduce adverse impacts on humpback whales due to vessel noise.
73	Organization: O04-21	iv. Humpback Whale Cautionary Area (Nov 15-April 15) Recommendations 4. Prohibit use of air-deployed mid-frequency active sonar The Humpback Whale Special Reporting Area in Kaiwi Channel encompasses important seasonal humpback whale breeding whale habitat (including the Hawaiian Islands Humpback Whale National Marine Sanctuary and part of the "Oʻahu, Molokaʻi, Lānaʻi, and Maui" breeding BIA) and an important year-round habitat area for the Main Hawaiian Islands insular population of false killer whales. The geographic boundaries of the Humpback Whale Cautionary Area should be extended to encompass the Special Reporting Area in Kaiwi Channel.	The comment's request to prohibit "air-deployed" mid-frequency active sonar is based on one paper (Falcone et al., 2017), which is a Navy-funded project designed to study the behavioral responses of a single species, Cuvier's beaked whales, to mid-frequency active sonar. The Navy relied upon the best science that was available to develop behavioral response functions for beaked whales and other marine mammals in consultation with NMFS for the Draft EIS/OEIS. The article cited in the comment (Falcone et al., 2017) was not available at the time the Draft EIS/OEIS was published but does not change the current Draft EIS/OEIS criteria or conclusions. The new information and data presented in the article was thoroughly reviewed when it became available and further considered in discussions with some of the paper's authors following its first presentation in October 2017 at a recent scientific conference. Many of the confounding variables requiring further analysis for beaked whales and dipping sonar impact assessment are still being researched under continued Navy funding through 2019.

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
			There are no beaked whale biologically important areas in this Cautionary Area (renamed the 4-Islands Region Mitigation Area), and the Mitigation Area is generally shallower than beaked whales' preferred habitat. Behavioral responses of beaked whales from dipping and other sonars cannot be universally applied to other marine mammal species. Research indicates that there are distinct individual variations as well as strong behavioral state considerations that influence any response or lack of response (Goldbogen et al., 2013; Harris et al., 2017). Therefore, it is expected that other species would have highly variable individual responses ranging from some response to no response to any anthropogenic sound. This variability is accounted for in the Navy's current behavioral response curves described in the HSTT Draft EIS/OEIS and supporting technical reports. Furthermore, the potential effects of dipping sonar have been rigorously accounted for in the Navy's analysis. Parameters such as power level and propagation range for typical dipping sonar use are factored into HSTT acoustic impact analysis along with guild specific criteria and other modeling variables, as detailed in the Draft EIS/OEIS and associated technical reports for criteria and acoustic modeling. Further, due to lower power settings for dipping sonar, potential impact ranges of dipping sonar are significantly lower than surface ship sonars. For example, the HSTT average modeled range to TTS of dipping sonar for a 1-second ping on low-frequency cetacean (i.e., blue whale) is 77 m, and for mid-frequency cetaceans including beaked whales is 22 m (HSTT Draft EIS/OEIS Table 3.7-7). This range is easily monitored for marine mammals by a hovering helicopter and is

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
			accounted for in the Navy's proposed mitigation ranges for dipping sonars (200 yds. Or 183 m). Limited ping time (i.e., less dipping sonar use as compared to typical surface ship sonar use) and lower power settings therefore would limit the impact from dipping sonar to any marine mammal species. This is an area of extremely low use for air-deployed mid-frequency active sonar. Prohibiting air-deployed mid-frequency active sonar in the Mitigation Area would not be any more protective to marine mammal populations generally, or the Main Hawaiian Islands insular false killer whale in particular, than currently implemented procedural mitigation measures for air-deployed mid-frequency active sonar and does not meet the Navy's criteria of being biologically effective.
74	Organization: O04-22	iv. Humpback Whale Cautionary Area (Nov 15-April 15) Recommendations 5. Prohibit use of low-frequency active sonar The Humpback Whale Special Reporting Area in Kaiwi Channel encompasses important seasonal humpback whale breeding whale habitat (including the Hawaiian Islands Humpback Whale National Marine Sanctuary and part of the "Oʻahu, Molokaʻi, Lānaʻi, and Maui" breeding BIA) and an important year-round habitat area for the Main Hawaiian Islands insular population of false killer whales. The geographic boundaries of the Humpback Whale Cautionary Area should be extended to encompass the Special Reporting Area in Kaiwi Channel.	This was proposed because the commenters suggested that "Baleen whales are vulnerable to the impacts of low-frequency active sonar, particularly in calving areas where low-amplitude communication calls between mothers and calves can be easily masked." As described in Section 3.7.2.3.1 (Humpback Whale [Megaptera novaeangliae], Hawaii Distinct Population Segment), the best available science has demonstrated humpback whale population increases and an estimated abundance greater than some pre-whaling estimates. This data does not indicate any population-level impacts from decades of ongoing Navy training and testing in the Hawaiian Islands.
75	Organization: O04-23	(2) Additional habitat areas of importance i. Additional habitat areas of importance within the southern California portion of the HSTT Study Area a. Important beaked whale habitat in the Southern California Bight	The basis for this comment includes incorrect or outdated information or information that does not reflect the environment present in the HSTT Study Area, such as, "…beaked whale populations in the California Current have shown significant, possibly drastic declines

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
		At the same time, beaked whale populations in the California Current have shown significant, possibly drastic declines in abundance over the last twenty years.	in abundance over the last twenty years." The citation provided in the footnote to the comment and postulated "decline" was for beaked whales up until 2008 – so does not represent the last 20 years – and was a postulated trend for the entire U.S. West Coast, not data which is specific to the HSTT Study Area. As noted in Section 3.7.3.1.1.7 (Long-Term Consequences), the postulated decline was in fact not present within the Southern California portion of the HSTT Study Area where abundances of beaked whales have remained higher than other locations off the U.S. West Coast. In addition, the authors of the 2013 citation (Moore & Barlow, 2013) have published trends based on survey data gathered since 2008 for beaked whales in the California Current, which now includes the highest abundance estimate in the history of these surveys (Barlow 2016; Moore and Barlow 2017; Carretta et al. 2017). Also, when considering the portion of the beaked whale population within the Southern California portion of the HSTT Study Area and as presented in the Draft EIS/OEIS, multiple studies have documented continued high abundance of beaked whales and the long-term residency of documented individual beaked whales, specifically where the Navy has been training and testing for decades; see for example Debich et al., 2015a; Debich et al., 2015b; Falcone & Schorr, 2012, 2014; Hildebrand et al., 2009; Moretti, 2016; Širović et al., 2016; Smultea & Jefferson, 2014. There is no evidence that there have been any population-level impacts to beaked whales resulting from Navy training and testing in the Southern California portion of the HSTT Study Area. The Navy did provide analysis and consideration of additional geographic mitigation for beaked whales in the Southern

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
			California Bight in Section K.7.2 (Southern California Public Comment Mitigation Area Assessment) and specifically Section K.7.2.7 (Northern Catalina Basin and the San Clemente Basin) regarding the stated concern over the possible presence of Perrin's beaked whale. See Section 5.4.1.2 (Mitigation Area Assessment) for additional details regarding the assessments of areas considered for mitigation.
76	Organization: O04-24	San Nicholas Basin These findings indicate that the San Nicolas Basin represents important habitat for these whales, despite its high level of acoustic disturbance. It may be that the energetic costs of displacement into sub-optimal foraging habitat outweigh the costs of repeated sonar exposure for whale survival, while creating conditions of a population sink, such as has been seen on the Navy's AUTEC range. At a minimum, the Navy should carefully consider implementing the "refuge" during the next five-year operation period and should consider all possible habitat-based management efforts to address impacts on the population.	Within San Nicolas Basin, there is a documented, recurring number of Cuvier's beaked whales strongly indicating that the Navy is not having a population-level impact to this species. This is supported by repeated visual re-sighting rates of individuals, sightings of calves and, more importantly, reproductive females, and passive acoustic assessments of steady vocalization rates and abundance over at least the most recent 7-year interval. Also it is incorrect to consider as fact that there is a "population sink, such as has been seen on the Navy's AUTEC range." In the citation provided, that statement is merely a hypothesis, yet to be demonstrated. Navy did provide analysis and consideration of additional geographic mitigation for beaked whales in the San Nicolas Basin in Section K.7.2 (Southern California Public Comment Mitigation Area Assessment) and specifically Section K.7.2.1 (San Nicolas Basin). See Section 5.4.1.2 (Mitigation Area Assessment) for additional details regarding the assessments of areas considered for mitigation. The Navy has been funding Cuvier's beaked whale research specifically in San Nicolas Basin since 2006. This research is planned to continue for at least the next five years through the duration of the planned HSTT MMPA

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
			permit. Cumulative from 2006 to 2016, over 170 individual Cuvier's beaked whales have been catalogued within San Nicolas Basin. Schorr et al. (2018) state for the most recent field season from 2016 to 2017 that: Identification photos of suitable quality were collected from 69 of the estimated 81 individual Cuvier's beaked whales encountered in 2016–2017. These represented 48 unique individuals, with eight of these whales sighted on two different days, and another three on three different days during the study period. Nineteen (39%) of these whales had been sighted in previous years. Many more whales identified in 2016 had been sighted in a previous year (16/28 individuals, 57%), compared to 2017 (5/22 individuals, 23%), though both years had sightings of whales seen as early as 2007. There were three adult females photographed in 2016 that had been sighted with calves in previous years, one of which was associated with her second calf. Additionally, a fourth adult female, first identified in 2015 without a calf, was subsequently sighted with a calf. The latter whale was sighted for a third consecutive year in 2017, this time without a calf, along with two other adult females with calves who had not been previously sighted. These sightings of known reproductive females with and without calves over time (n = 45) are providing critically needed calving and weaning rate data for Population Consequences of Disturbance (PcoD) models currently being developed for this species on SOAR (Southern California Anti-submarine Warfare Range). In 2018, an estimate of overall abundance of Cuvier's beaked whales at the Navy's instrumented range in San Nicolas Basin was obtained using new dive-counting acoustic methods and an archive of passive acoustic

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
			M3R data representing 35,416 hours of data (Moretti 2017, DiMarzio 2018). Over the 7-year interval from 2010 to 2017, there was no observed change and perhaps a slight increase in annual Cuvier's beaked whale abundance within San Nicolas Basin (DiMarzio 2018). There does appear to be a repeated dip in population numbers and associated echolocation clicks during the fall centered around August and September (Moretti 2017, DiMarzio 2018). A similar August and September dip was noted by researchers using stand-alone off-range bottom passive acoustic devices in Southern California (Širović et al., 2016; Rice et al., 2017). This dip in abundance may be tied to some as yet unknown population dynamic or oceanographic and prey availability dynamics.
77	Organization: O04-25	Santa Catalina Basin This population is subject to regular acoustic disturbance due to the presence of the Shore Bombardment Area (SHOBA) and 3803XX; for two individuals satellite-tagged in the Santa Catalina Basin, 20% and 27% of locations fell within these two activity areas, respectively. At a minimum, the Navy should carefully consider implementing the "refuge" during the next five-year authorization period and should continue to consider all possible habitat-based management efforts to address impacts on the population.	The water space areas mentioned in the comment as "(SHOBA)" off the southern end of San Clemente Island are waters designated as federal Danger and Safety Zones via formal rule making (Danger Zone – 33 CFR 334.950 and Safety Zone – 33 CFR 165.1141) because they are adjacent to the shore bombardment impact area that is on land at the southern end of San Clemente Island. Waters designated as "3803XX," which are associated with the Wilson Cove anchorages and moorings, where ship calibration tests, sonobuoy lot testing, and special projects take place, are designated as federal Safety and Restricted Zones via formal rule making (Safety Zone – 33 CFR 165.1141 and Restricted Zone – 33 CFR 334.920). The comment states a concern that this population of Cuvier's beaked whale is, "subject to regular acoustic disturbance due to the presence of the Shore

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
			Bombardment Area," which is not correct. The SHOBA is a naval gun impact area located on land at the southern end of San Clemente Island. This area is an instrumented land training range used for a variety of bombardment training and testing activities. Based on a figure in the comment (labeled in part "SHOBA in red"), it appears the comment confuses the in-water administrative boundaries used for temporary exclusion of vessels for public safety, with the delineation of the land impact area where Navy training and testing activity may occur. The in-water administrative boundary for SHOBA does not delineate the locations where a ship firing at land targets must be located and does not represent where gunfire rounds are targeted. The water area in Santa Catalina Basin is a controlled safety zone in the very unlikely event a round goes over the island and lands in the water. With the modern advent of better precision munitions, computers, and advanced fire control, that probability is very, very remote. Navy vessels use the waters south of San Clemente Island (SHOBA West and SHOBA East) from which to fire into land targets on southern San Clemente Island (see the HSTT Draft EIS/OEIS Figure 2.1-7). Therefore, there would not be any underwater acoustic disturbance to Cuvier's beaked whales located within the Catalina Basin from in-water explosives or ship firing.
78	Organization: O04-26	Southernmost edge of California Current, west of Tanner and Cortez Banks 1. … we recommend assessing the designation of the southern offshore waters of the Southern California Bight as a seasonal time-area management area for Cuvier's beaked whales between November and June.	Analysis of the Southernmost Edge of the California Current, West of Tanner-Cortes Bank and the presence of Cuvier's beaked whales was addressed in Section K.7.2.4 (Southernmost Edge of California Current, West of Tanner-Cortes Bank) and Section K.7.2.6 (Cuvier's Beaked Whale Habitat Areas Mitigation Assessment). Also see Section 3.7.2.3.24 (Cuvier's Beaked Whale

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
			(*Ziphius cavirostris*)) for additional information regarding this species. As noted in Appendix K (Geographic Mitigation Assessment) and Section 5.3 (Procedural Mitigation to be Implemented), the Navy will continue to implement procedural mitigation measures throughout the Study Area. Baumann-Pickering et al. (2014a, b, 2015) did not specify this area as biologically important and the author's data only indicated there have been detections of the Cuvier's beaked whales within this area. Further, the species is widely distributed within Southern California and across the Pacific with almost all suitable deep water habitat >800 m in Southern California conceivably containing Cuvier's beaked whales. Only limited population vital rates exist for beaked whales, covering numbers of animals, populations vs. subpopulations determination, and residency time for individual animals (Schorr et al., 2017, 2018). The science of passive acoustic monitoring is positioned to answer some questions on occurrence and seasonality of beaked whales, but cannot as of yet address all fundamental population parameters including individual residency time. Furthermore, while passive acoustic monitoring within Southern California has been ongoing for 28 years, with many sites funded by the Navy, not all sites have been consecutively monitored for each year. All of the single bottom-mounted passive acoustic devices used for the analysis by Baumann-Pickering et al. (2014a, b, 2015), and used in the comment to support its argument, are not continuous and have various periodicities from which data have been collected. Specifically, devices have been deployed and removed from various locations with some sites having multiple years of data, others

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
			significantly less, with perhaps just a few months out of a year. For instance, Site E, located west of Tanner and Cortes Banks and used by the commenter to justify restrictions in this area, was only monitored for 322 days from September 2006 through July 2009 (obtaining slightly less than a full year's worth of data) over 28 years. Site E was also used again for another 63 days from Dec 2010 through February 2011. During this second monitoring period at Site E, Gassman et al. (2015) reported detection of only three Cuvier's beaked whales over six separate encounters with time intervals of 10–33 minutes. As sources of data associated with a single monitoring point, the two monitoring episodes conducted at Site E may not be indicative of Cuvier's beaked whale presence at other locations within Southern California, which lack comparable monitoring devices. Nor would they be indicative of overall importance or lack of importance of the area west of Tanner and Cortes Banks. This point is brought home by more recent acoustic sampling of bathymetrically featureless areas off Southern California with drifting hydrophones conducted by NMFS, which detected many beaked whales over abyssal plains and not associated with slope or seamount features. This counters a common misperception that beaked whales are primarily found over slope waters, in deep basins, or over seamounts (Griffins and Barlow 2016). Most importantly, older passive acoustic data prior to 2009 may not be indicative of current or future occurrence of beaked whales, especially in terms of potential impact of climate change on species distributions within Southern California. To summarize,

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
			these limited periods of monitoring (322 days in a 3-year period prior to 2010 and 63 days in 2011) may or may not be reflective of current beaked whale distributions within Southern California and into the future. Furthermore, passive acoustic-only detection of beaked whales, without additional population parameters, can only determine relative occurrence, which could be highly variable over sub-regions and through time. While Cuvier's beaked whales have been detected west of Tanner and Cortes Banks, as noted above this species is also detected in most all Southern California locations > 800 m in depth. Furthermore, the Navy has been training and testing in and around Tanner and Cortes Banks with the same basic systems for over 40 years, with no evidence of any adverse impacts having occurred. Further, there are no indications that Navy training and testing in the Southern California portion of the HSTT Study Area has had any adverse impacts on populations of beaked whales in Southern California. In particular, a re-occurring population of Cuvier's beaked whales co-exists within San Nicolas Basin to the east, an area with significantly more in-water sonar use than west of Tanner and Cortes Banks. To gain further knowledge on the presence of beaked whales in Southern California, the Navy continues to fund additional passive acoustic field monitoring, as well as research advancements for density derivation from passive acoustic data. For the 5-year period from 2013 to 2017, U.S. Pacific Fleet on behalf of the U.S. Navy funded $14.2 million in marine species monitoring within Hawaii and Southern California. Specifically, in terms of beaked whales, the Navy has been funding beaked whale population dynamics, tagging, and passive acoustic

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
			studies within HSTT since 2007 (Rice et al., 2017, Širović, et al., 2017; Schorr et al., 2017, 2018, Moretti 2017, DiMarzio et al., 2018). Variations of these efforts are planned to continue through the duration of the next HSTT MMPA permit cycle using a variety of passive acoustic, visual, tagging, photo ID, and genetics research tools. This Navy effort is in addition and complementary to any planned NMFS efforts for beaked whales and other marine mammals. For instance, the Navy is co-funding with NMFS and the Bureau of Ocean Energy Management a planned summer-fall 2018 visual and passive acoustic survey along the U.S. West Coast and off Baja Mexico. New passive detection technologies focusing on beaked whales will be deployed during these surveys (similar to Griffiths and Barlow, 2016). As noted in Appendix K (Geographic Mitigation Assessment), the waters west of Tanner and Cortes Banks are critical to the Navy's training and testing, and therefore it is not practicable to preclude activities within that water space in the Southern California portion of the HSTT Study Area. Reasonable mitigation measures, as discussed in Appendix K (Geographic Mitigation Assessment), would limit the impact of training and testing on marine mammals, and especially beaked whales, in this area. Given that there is no evidence that Navy training and testing activities are having significant impacts to population of beaked whales anywhere in the Southern California portion of the HSTT Study Area, the uncertainty of current use by Cuvier's beaked whales of the area west of Tanner and Cortes Banks, the fact that general occurrence of beaked whales in Southern California may not necessarily equate to factors typically

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
			associated with biologically important areas, and consideration of the importance of Navy training and testing in the areas around Tanner and Cortes Banks discussed in Appendix K (Geographic Mitigation Assessment), additional geographic mitigation specifically for the area west of Tanner and Cortes Banks is not warranted.
79	Organization: O04-27	Northern Catalina Basin and San Clemente Basin We recommend that the northern Catalina basin and the waters southeast of Santa Catalina Island (approximate coordinates of 33.28 N., -118.25 W.), and the San Clemente Basin (approximate coordinates of 32.52 N., -118.32 W.), both based on location of HARP deployments, be considered as management areas for Perrin's beaked whales.	The Santa Catalina Basin area and Perrin's beaked whales were addressed in Section K.7.2.3 (Catalina Basin) and K.7.2.7 (Northern Catalina Basin and the San Clemente Basin). Also see Section K.7.2.7.2 (Northern Catalina Basin and Waters Southeast of Catalina Island Perrin's Beaked Whale Habitat Mitigation Considerations) for additional information regarding this species. As noted in Appendix K (Geographic Mitigation Assessment) and Section 5.3 (Procedural Mitigation to be Implemented), the Navy will continue to implement procedural mitigation measures throughout the Study Area. All of the single bottom-mounted passive acoustic devices used for the analysis by Baumann-Pickering et al. (2014) and used by the commenter to support their argument are not continuous and have various periodicities for which data have been collected. As single point sources of data, these passive acoustic devices may not be indicative of Perrin's beaked whale presence at other locations within Southern California without comparable devices. Nor would older data prior to 2009 be indicative of current or future occurrence especially in terms of potential impact of climate change on species distributions. Navy-funded passive acoustic monitoring within the Southern California portion of the HSTT Study Area has

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
			been ongoing for the past 21 years, but not all areas are monitored continuously, and devices have been deployed and removed from various locations. Santa Catalina Basin was only monitored from August 2005 to July 2009. Santa Catalina Basin has not been monitored under Navy funding since 2009 because other areas in Southern California were prioritized for passive acoustic device placement by the researchers. For San Clemente Island, the single monitoring site "S" used in Baumann-Pickering et al. (2014) and cited as the source of the comment's claim for San Clemente Basin was only deployed for a limited time of approximately 1.5 years, resulting in 409 days of data (September 2009–May 2011). For both sites combined, only 41 hours of BW43 signal types were detected over a cumulative approximately five-and-a-half years of monitoring. The 41 hours of BW43 detections therefore only represents a small fraction of overall recording time (less than 1%). The beaked whale signal type detected called BW43 has been suggested as coming from Perrin's beaked whales (Baumann-Pickering et al. 2014), but not yet conclusively and scientifically confirmed. A different Navy-funded single site south of San Clemente Island within the San Clemente Basin has had a passive acoustic device in place from July 2014 through current. Širović et al. (2016) and Rice et al. (2017) contain the most current results from San Clemente Basin site "N." While Širović et al. (2016) and Rice et al. (2017) do report periodic passive acoustic detections of Mesoplodon beaked whales thought to be Perrin's beaked whale in San Clemente Basin, the overall detection rate, periodicity, and occurrence has not been high. Between May 2015 and June 2016, there were only

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
			seven weeks in which potential Perrin's beaked whale echolocation clicks were detected, with each week having less than 0.14 hours/ per week of detections. Acoustic sampling of bathymetrically featureless areas off Southern California with drifting hydrophones by NMFS detected many beaked whales over abyssal plains and not always associated with slope or seamount features, which counters a common misperception that beaked whales are primarily found over slope waters, in deep basins, or over seamounts (Griffins and Barlow 2016). One of these devices was deployed within the Southern California portion of the HSTT Study Area. In addition, analysis of NMFS visual survey data from 2014, the most recent year available, showed an increase in Mesoplodon beaked whales along the entire U.S. West Coast, which the authors attributed to an influx of tropical species of Mesoplodon during the unusually warm water condition that year (Barlow 2016; Moore & Barlow 2017). Perrin's beaked whale, part of the Mesoplodon guild, could be part of these sightings. In summary, San Clemente Basin and Santa Catalina Basin with similar low passive acoustic detection rates are likely to be part of Perrin beaked whale's general distribution along the U.S. West Coast and in particular Southern California and Baja Mexico. This distribution is likely to be wide ranging for Perrin's beaked whales as a species and highly correlated to annual oceanographic conditions. Santa Catalina and San Clemente basins do have infrequent suspected Perrin's beaked whale passive acoustic detections from a limited number of devices, but these areas may not specifically represent unique high occurrence locations warranting geographic protection beyond existing Navy protective measures.

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
			The Navy has been training and testing in and around the northern Catalina Basin and waters southeast of Catalina Island with the same systems for over 40 years, and there is no evidence of any adverse impacts having occurred and no indications that Navy training and testing has had any adverse impacts on populations of beaked whales in Southern California. The main source of anthropogenic noise in the Catalina Basin and waters south of San Clemente Island are associated with commercial vessel traffic concentrated in the northbound and southbound lanes of the San Pedro Channel that runs next to Catalina Island and leads to and from the ports of Los Angeles/Long Beach and other commercial traffic from San Diego and ports to the north and south of Southern California. These waters in and around northern Catalina Basin and waters southeast of Catalina Island are critical to the Navy's training and testing, and so it is not practicable to limit or reduce access or preclude activities within that water space in the Southern California portion of the HSTT Study Area. Additional limitations as discussed in Appendix K (Geographic Mitigation Assessment) would limit training and impact readiness. Given that there is no evidence of impacts to the population of beaked whales in the area, and low potential occurrence of Perrin's beaked whales in the Southern California portion of the HSTT Study Area, geographic mitigation would not effectively balance a reduction of biological impacts with an acceptable level of impact on military readiness activities.
80	Organization: O04-28	b. Important fin whale habitat off Southern California Since 2009, fin whales on the Southern California Range Complex have aggregated during the winter months in waters	As described and detailed in the EIS/OEIS, the Navy implements a number of ship-strike risk reduction

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
		just off the mainland shelf, between the 200 m and 1000 m isobaths (see Figure 3). This population is at particular risk of ship-strike on the naval range given their shallower-water foraging in relatively deep water, and they have been known to be struck by vessels in the recent past. As such, we recommend that the waters between the 200 m and 1000 m isobaths be assessed for time-area management so that, at minimum, ship-strike risk-reduction measures for fin whales can be implemented during the months of November through February, when the whales aggregate in the area.	measures for all vessels, in all locations and seasons, and for all marine mammal species. New research by Širović et al. (2017) supports a hypothesis that between the Gulf of California and Southern California, there could be up to four distinct sub-populations based on fin whale call types, including a Southern California resident population. There is also evidence that there can be both sub-population shifts and overlap within Southern California (Širović et al. 2017). Scales et al. (2017) also postulated two Southern California sub-populations of fin whales based on satellite tagging and habitat modeling. Scales et al. (2017) stated that some fin whales may not follow the typical baleen whale migration paradigm, with some individuals found in both warm, shallow nearshore waters < 500 m, and deeper cool waters over complex seafloor topographies. Collectively, the author's spatial habitat models with highest predicted occurrence for fin whales cover the entire core training and testing portion of the Southern California portion of HSTT, not just areas between 200 and 1000 m. Results from Navy-funded long-term satellite tagging of fin whales in Southern and Central California still shows some individual fin whales engage in wide-ranging movements along the U.S. West Coast, as well as large daily movements well within subareas (Mate et al. 2017). In support of further refining the science on Southern California fin whales, Falcone and Schorr (2014) examined fin whale movements through photo ID and short-to-medium term (days-to-several weeks) satellite tag tracking under funding from the Navy. The authors conducted small boat surveys from June 2010 through January 2014, approximately three-and-a-half years. Of interest in

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
			terms of the comment and the 200–1000 m isobaths occurrence, more fin whale tag locations were reported off the Palos Verdes Peninsula and off of the Los Angeles/Long Beach commercial shipping ports in fall, both areas north of and outside of the Navy's Southern California Range Complex. Compared to the above areas, there were not as many tag locations in the similar isobaths region off San Diego associated with the Navy range area. Falcone and Schorr (2014) did document an apparent inshore-off-shore distribution between winter-spring and summer-fall. Given the apparent resident nature of some fin whales in Southern California as discussed in Falcone and Schorr (2014), Scales et al. (2017), and Širović et al. (2017), it remains uncertain if the inshore-offshore seasonal pattern as well as sub-population occurrence will persist into the future, or if fin whales will change distribution based on oceanographic impacts on available prey (ex. El Nino, climate change, etc.). The efforts from Falcone and Schorr on fin whales began in 2010 and are planned to continue for the next several years under Navy monitoring funding to further refine fin whale population structure and occurrence within Southern California. The data from the various single bottom-mounted passive acoustic devices used in the analysis are not continuous and have various periodicities for which data have been collected. Many of these devices are purposely placed in 200–1000 m of water. Given these are point sources of data, they may or may not be indicative of fin whale calling or presence at other locations within Southern California without devices. Passive acoustic analysis is only useful for those

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
			individuals that are calling and may not indicate total population occurrence. Low-frequency fin whale calls by their very nature have relatively long underwater propagation ranges so detections at a single device could account for individuals 10–50 miles away if not further, depending on local propagation conditions. This would mean calling whales are not in the 200–1000 m area. Širović et al. (2015) acknowledge in discussing their data biases, that their use of "call index" may best indicate a period of peak calling. But fin whales produce multiple call types depending on behavioral state. Based on technology limitations, some fin whale call types were not included in Širović et al., (2015). The following observations regarding the comment are germane: 1. The study cited by NRDC (Širović et al., 2015) and used as the basis for "Figure 3" concerns trends seen within the Southern California Bight, not exclusively the SOCAL Range Complex; 2. The research used as the basis for Figure 3 was funded by the Navy to develop baseline information for the areas where Navy trains and tests and was by no means designed to or otherwise intended as a representative sample of all waters off California or the entire habitat of the fin whale population in the area; 3. It is not correct to assume detected vocalizations (a "call index") reported in Širović et al. (2015) for fin whales equates with where fin whales are aggregated in the Southern California Bight. For example, the acoustic monitoring data did not pick up or otherwise correspond to the observed seasonal distribution shift of fin whales indicated by visual survey data covering the same time periods (Campbell et al., 2015; Douglas et al., 2014);

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
			4. Širović et al. (2015) make no such claim of aggregations during the winter months but instead compare call index rates and state that the purpose for the paper was to demonstrate that passive acoustics can be a powerful tool to monitor population trends, not relative abundances; 5. There is no science to support the contention that fin whales are "at particular risk of ship-strike on the naval range." Two fin whales were struck by the Navy in 2009 in the Southern California portion of HSTT as Navy noted in Appendix K (Geographic Mitigation Assessment), but there have been no fin whales struck and in fact no whales of any species struck in the subsequent 9-year period despite a documented increase in the fin whale population inhabiting the area (Barlow, 2016; Moore & Barlow, 2011; Smultea & Jefferson, 2014). Furthermore, one of those vessel strikes occurred at the end of the recommended mitigation timeframe (February) and the other well outside the time period (May), so the proposed mitigation would only have been marginally effective, if at all. Neither of these Navy fin whale strike locations were close to shore (both >50–60 NM from shore), or associated with coastal shipping lanes. Based on an analysis of Navy ship traffic in the HSTT Study Area between 2011 and 2015, median speed of all Navy vessels within Southern California is typically already low, with median speeds between 5 and 12 knots (CNA, 2016). This includes areas within and outside of 200–1000 m within Southern California, with slowest speeds closer to the coast; and 6. As presented in the EIS/OEIS, fin whales are present off all the waters of Southern California year-round (Sirovic et al., 2017; Širović et al., 2015). Using available

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
			quantitative density and distribution mapping, the best available science, and expert elicitation, definitive areas of importance for fin whales could not be determined by a panel of scientists specifically attempting to do so (Calambokidis et al., 2015). Navy vessels already operate at a safe speed given a particular transit or activity need. This also includes a provision to avoid large whales by 500 yards, so long as safety of navigation and safety of operations is maintained. Previously, the Navy commissioned a vessel density and speed report for HSTT (CNA, 2016). Based on an analysis of Navy ship traffic in HSTT between 2011 and 2015, median speed of all Navy vessels within Southern California is typically already low, with median speeds between 5 and 12 knots (CNA, 2016). Slowest speeds occurred closer to the coast and islands. In conclusion, speed restrictions within 200–1000 m is unwarranted given the wide range of fin whale movements along the U.S. West Coast including areas within and outside of 200–1000 m contours, sometimes large-scale daily movements within regional areas as documented from Navy-funded satellite tagging, the current lack of ship strike risk from Navy vessels in Southern California (2010–2017), the already safe training and testing ship speeds Navy uses within HSTT, and existing Navy mitigation measures including provisions to avoid large whales by 500 yards where safe to do so.
81	Organization: O04-29	ii. Additional habitat areas of importance within the Hawai'an portion of the HSTT Study Area a. 'Alenuihāhā Channel	Analysis of the areas within and around the Alenuihaha Channel and the marine mammal species mentioned in the comment were provided in Section K.3.1.7 (Northwest Hawaii Island Humpback Whale Reproduction Area, Settlement Areas 1-B, 1-C, and 1-D),

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
		1. … the Navy should continue to implement the mitigation measures set forth in the Settlement Agreement for the ʻAlenuihāhā Channel	Section K.3.2 (Hawaii Island Dwarf Sperm Whale Small and Resident Population Area), Section K.3.3.1.3 (North and West of Hawaii Island False Killer Whale Small and Resident Population Area, Settlement Areas 1-A through 1-E, 2-E, and 2-A through 2-D), Section K.3.4 (Hawaii Island Pygmy Killer Whale Small and Resident Population Area), Section K.3.5 (Hawaii Island Short-Finned Pilot Whale Small and Resident Population Area), Section K.3.6 (Hawaii Island Melon-Headed Whales Small and Resident Population Area), Section K.3.7.6 (Hawaii Island Common Bottlenose Dolphin Small and Resident Population Area, Settlement Areas 1-A through 1-E, and 2-E), K.3.8.4 (Hawaii Island Pantropical Spotted Dolphins Small and Resident Population Area, Settlement Areas 1-C through 1-E and 2-E), K.3.9.4 (Hawaii Island Spinner Dolphins Small and Resident Population Area), Section K.3.10 (Hawaii Island Rough-Toothed Dolphins Small and Resident Population Area), Section K.3.11 (Hawaii Island Cuvier's Beaked Whale Small and Resident Population Area), Section K.3.1.2 (Hawaii Island Blainville's Beaked Whale Small and Resident Population Area), and Sections K.5.2 (Settlement Areas Within the Hawaii Portion of the HSTT Study Area) through K.5.4 (Proposed Mitigation Areas that Overlap the Hawaii Portion of the HSTT Settlement Agreement Areas) regarding the analysis of Settlement Areas within the Hawaii portion of the HSTT Study Area. Additional information on the marine mammals mentioned in the comment is also provided in the species-specific sub-sections in Section 3.7.2 (Affected Environment). Under the terms of the settlement agreement executed by the parties in September 2015, the Navy agreed to prohibit or restrict the use of certain hull-mounted active

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
			sonar and in-water explosives within defined areas until the current authorizations under MMPA and ESA expire on December 24, 2018. While certain time and area restrictions were agreed to in the HSTT settlement, these measures were not selected based on scientific or operational analyses, but instead were agreed to as temporary measures to settle the pending lawsuit. As such, the settlement and its terms were never intended to be a framework for how the Navy develops or implements future mitigation. More importantly, unlike the settlement agreement, the EIS/OEIS, consistent with the mandates of NEPA, contains a thorough discussion, using the best available science, of the underlying biological and scientific factors associated with possible mitigation for species within potential geographic areas. Specifically, in Appendix K, the Navy used scientific data on vulnerable or sensitive species such as beaked whales and main Hawaiian Islands insular false killer whales to derive the geographic mitigation areas in the Draft EIS/OEIS. This analysis is then compared against the operational needs of the Navy for its training and testing activities to develop mitigation procedures and areas that have the least practicable adverse impact on marine mammals and allow the Navy to meet its training and testing requirements. As reiterated throughout the many species-specific analyses presented in Section K.3 (Biologically Important Areas Within the Hawaii Range Complex Portion of the HSTT Study Area), the Alenuihaha Channel has unique attributes for training and testing that do not exist elsewhere in the Hawaiian Range Complex. Therefore, these mitigation measures set forth in the Settlement

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
			Agreement would not be practicable to continue to implement.
82	Organization: O04-30	ii. Additional habitat areas of importance within the Hawai'an portion of the HSTT Study Area a. 'Alenuihāhā Channel 2. the Navy should make efforts to further reduce potential impacts in this area by further prohibiting or restricting the use of air-deployed mid-frequency active sonar and all other sources of mid-frequency active sonar, used in major training exercises and by navy units (e.g., in unit-level training and in maintenance and system checks while in transit) in this area.	As noted above, analyses of the marine mammal species mentioned in the comment for additional geographic mitigation are discussed in Section K.3 (Biologically Important Areas within the Hawaii Range Complex Portion of the HSTT Study Area) Sections K.5.2 (Settlement Areas Within the Hawaii Portion of the HSTT Study Area) through K.5.4 (Proposed Mitigation Areas that Overlap the Hawaii Portion of the HSTT Settlement Agreement Areas) regarding the analysis of Settlement Areas within the Hawaii portion of the HSTT Study Area. Additional information on the marine mammals mentioned in the comment is also provided in the species-specific sub-sections in Section 3.7.2 (Affected Environment). Based on these analyses, the Navy will implement additional mitigation within the Hawaii Island Mitigation Area (which includes the formerly named West-side Hawaii Island Cautionary Area), which includes limits to the amount of surface ship hull-mounted mid-frequency active sonar and dipping sonar during all training and testing, and the prohibition of explosives that would potentially result in the take of marine mammals during training and testing (year-round) as detailed in Section 5.4.2 (Mitigation Areas for Marine Mammals in the Hawaii Range Complex). These mitigation measures are likely to result in an avoidance or reduction of impacts from active sonar and explosives from the Proposed Action The EIS/OEIS and Appendix K (Geographic Mitigation Assessment) discuss the Navy's analysis of further mid-frequency active sonar restrictions in the near- and offshore areas of Hawaii Island, including the Alenuihaha

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
			Channel. Other sonar systems are likely to be used less frequently in the vicinity than surface ship mid-frequency active sonars. Other mid-frequency active sonar systems for which the Navy is seeking authorization within the HSTT Study Area are used less frequently than surface ship sonars, and more importantly are of much lower power with correspondingly lower propagation ranges and reduced potential behavioral impacts. Further, only a small number of surface ships transit in the channel during major training exercises use mid-frequency active sonar due to spatial constraints. The entire strike group does not typically transit the Channel during RIMPAC or other integrated anti-submarine warfare training (e.g., Independent Deployer Certification). The Alenuihaha Channel is an actual channel that provides a vital and realistic analog for similar straits worldwide where the Navy could potentially and does operate. For example, transit training in the Alenuihaha Channel replicates these types of strait environments that meet the Navy's requirement to deploy Naval forces to ensure the free flow of commerce and the freedom of navigation by combatting piracy or mine threats. The comment's request to prohibit "air-deployed" mid-frequency active sonar is based on one paper (Falcone et al., 2017) which is a Navy-funded project designed to study behavioral responses of a single species, Cuvier's beaked whales, to mid-frequency active sonar. The Navy relied upon the best science that was available to develop behavioral response functions for beaked whales and other marine mammals in consultation with NMFS for the Draft EIS/OEIS. The article cited in the comment (Falcone et al., 2017) was not available at the

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
			time the Draft EIS/OEIS was published but does not change the current EIS/OEIS criteria or conclusions. The new information and data presented in the article was thoroughly reviewed when it became available and further considered in discussions with some of the paper's authors. Many of the confounding variables requiring further analysis for beaked whales and dipping sonar impact assessment are still being researched under continued Navy funding through 2019. However, the Navy is proposing new mitigation that includes a limit to the annual use of helicopter dipping sonar in the Hawaii Island Mitigation Area. Behavioral responses of beaked whales from dipping and other sonars cannot be universally applied to other marine mammal species. For example, Navy-funded behavioral response studies of blue whales to simulated surface ship sonar has demonstrated there are distinct individual variations as well as strong behavioral state considerations that influence any response or lack of response (Goldbogen et al., 2013). The same conclusion on the importance of exposure and behavioral context was stressed by Harris et al. (2017). Therefore, it is expected that other species would also have highly variable individual responses ranging from some response to no response to any anthropogenic sound. This variability is accounted for in the Navy's current behavioral response curves described in the HSTT Draft EIS/OEIS and supporting technical reports. Furthermore, the potential effects of dipping sonar have been accounted for in the Navy's analysis. Parameters such as power level and propagation range for typical dipping sonar use are factored into HSTT acoustic impact analysis along with guild-specific criteria and other

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
			modeling variables as detailed in the Draft EIS/OEIS and associated technical reports for criteria and acoustic modeling. Further, due to lower power settings for dipping sonar, potential impact ranges of dipping sonar are significantly lower than surface ship sonars. For example, the HSTT average modeled range to temporary threshold shift of dipping sonar for a 1-second ping on low-frequency cetaceans (i.e., blue whale) is 77 m, and for mid-frequency cetaceans including beaked whales is 22 m (HSTT Draft EIS/OEIS Table 3.7-7). This range is easily monitored for marine mammals by a hovering helicopter and is accounted for in the Navy's proposed mitigation ranges for dipping sonars (200 yd. or 183 m). Limited ping time (i.e., less dipping sonar use as compared to typical surface ship sonar use) and lower power settings therefore would limit the impact from dipping sonar to any marine mammal species. All locations within the HSTT Study Area have been used for Navy training and testing for decades. There has been no scientific evidence to indicate the Navy's activities are having adverse effects on populations of marine mammals, many of which continue to increase in number or are maintaining populations based on what regional conditions can support. Navy research and monitoring funding and the new science it supports continues within the HSTT Study Area under current NMFS MMPA and ESA permits, and is planned through the duration of any future permits. Given the lack of effects to marine mammal populations in the HSTT Study Area from larger, more powerful surface ship sonars, the effects from intermittent, less frequent use of lower powered mid-frequency dipping sonar or other mid-

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
			frequency active sonars would also not significantly affect small and resident populations. As reiterated throughout the species-specific analyses presented in Section K.3 (Biologically Important Areas Within the Hawaii Range Complex Portion of the HSTT Study Area), the Alenuihaha Channel has unique attributes for training and testing that do not exist elsewhere in the Hawaiian Range Complex. Any mitigation that limits or prohibits the use of other sources of mid-frequency active sonar would not be practicable to implement.
83	Organization: O04-31	b. Northeast Kaiwi Channel 1. At a minimum, the Navy should carefully consider implementing the mitigation measures set forth by the Settlement Agreement for the Northeast Kaiwi Channel	Analysis and consideration of Kaiwi Channel for additional geographic mitigation was provided in Section K.5.2.6 (Settlement Area 2-A), Section K.5.2.8 (Settlement Area 2-C), Section K.5.2.9 (Settlement Area 2-D), and Section K.3.3 (False Killer Whale Small and Resident Population Area: Main Hawaiian Island Insular Stock). The Navy is under no obligation to adopt all activity restrictions consistent with the terms of the settlement. Some of the settlement restrictions are not supported by the best available science, and others are not practicable to implement for the Navy's military readiness activities in the HSTT Study Area over a longer term. The Navy will implement additional mitigation within the Kaiwi Channel as detailed in Section 5.4.2 (Mitigation Areas for Marine Mammals in the Hawaii Range Complex) for the Humpback Whale Cautionary Area (renamed the 4-Islands Region Mitigation Area), to further avoid or reduce impacts on marine mammals from acoustic and explosive stressors and vessel strikes from the Proposed Action.
84	Organization: O04-32	b. Northeast Kaiwi Channel	Regarding the suggested prohibition or restriction of other acoustic sensors that have been in use for decades

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		2. In addition, the Navy should make efforts to further reduce potential impacts in this area by prohibiting or restricting the use of surface-ship hull-mounted mid-frequency active sonar, air-deployed mid-frequency active sonar, and all other sources of mid-frequency active sonar (i.e., not hull-mounted or helicopter-deployed), and to continue to consider all possible habitat-based management efforts to address impacts on the population.	(such as surface-ship hull-mounted mid-frequency active sonar, air-deployed mid-frequency active sonar, and all other sources of mid-frequency active sonar), the use of these sensors was considered. As detailed in Section K.4.1.6.1 (Navy Requirements for Area Specific Training and Testing), the recommendations in the comment would detrimentally impact the Navy's mission.
85	Organization: O04-33	c. Cross Seamount (Hawai'i) 1. … we recommend that the EIS assess the designation of a year-round management area to protect the seamount. 2. … the Navy should also consider habitat-based management measures for these other nearby seamounts.	Analysis and consideration of Cross Seamount and "other nearby seamounts" for additional geographic mitigation was provided in Section K.7.1 (Hawaii Public Comment Mitigation Area Assessment), including sub-sections K.7.1.1 (General Biological Assessment of Seamounts in the Hawaii Portion of the Study Area) and K.7.1.2 (Cross Seamount). As discussed in Section 4.7.1.3 (Mitigation Assessment), implementing new geographic mitigation measures in addition to ongoing procedural mitigation within the vicinity of Cross Seamount would not be effective at reducing adverse impacts on beaked whales or other marine mammal populations. The Navy has been training and testing in the broad ocean area around Cross Seamount with the same basic systems for over 40 years, and there is no evidence of any adverse impacts to marine species. Additionally, it would not be practicable to implement. The broad ocean area around Cross Seamount and the seamounts to the north are unique in that there are no similar broad ocean areas in the vicinity of the Hawaiian Islands that are not otherwise encumbered by commercial vessel traffic and commercial air traffic routes.
86	Organization: O04-34	d. Important habitat areas off O'ahu, Kaua'i, and Ni'ihau	In the Draft EIS/OEIS, the Navy considered the science, the Navy requirements, and the effectiveness of

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		In its evaluation of these areas, the DEIS presents several arguments as to why no Mitigation Areas have been identified on the western end of the Main Hawai'ian Islands. The primary reason is that many of the important habitat areas directly overlap with naval facilities … The Navy offers no scientific evidence to support its statements describing the minimal harm of their activities. We recommend that the Navy further consider the implementation of Mitigation Areas off O'ahu, Kaua'i, and Ni'ihau.	identified habitat areas off Oahu, Kauai, and Niihau as presented in Section K.3 (Biologically Important Areas within the Hawaii Range Complex Portion of the HSTT Study Area). This includes the five identified Biologically Important Areas off Oahu (false killer whale, humpback whale, pantropical spotted dolphin, bottlenose dolphin, and spinner dolphin) and three Biologically Important Areas off Kauai and Niihau (humpback whale, spinner dolphin, and bottlenose dolphin) as well as a discussion in Section K.1.1.5 (Mitigation Areas Currently Implemented) regarding the 4-Islands Region Mitigation Area. The primary reason for the rejection of additional mitigation is that, based on the Navy's analysis and as detailed in the sections referenced above, there is no scientific basis indicating the need for mitigation in the first place; see specifically the discussion in Section K.2.1.2 (Biological Effectiveness Assessment). As presented and reviewed in the Draft EIS/OEIS, the Navy has presented citations to research showing that in specific contexts (such as associated with urban noise, commercial vessel traffic, eco-tourism, or whale watching; see the Draft EIS/OEIS Section 3.7.2.1.5.2 [Commercial Industries]) and references (Dunlop, 2016; Dyndo et al., 2015; Erbe et al., 2014; Frisk, 2012; Gedamke et al., 2016; Hermannsen et al., 2014; Li et al., 2015; McKenna et al., 2012; Melcón et al., 2012; Miksis-Olds & Nichols, 2015; Nowacek et al., 2015; Pine et al., 2016; Williams et al., 2014c) (add Pirotta et al. 2018) or specifically for Hawaii (Heenehan et al., 2016a; Heenehan et al., 2016b; Heenehan et al., 2017a; Heenehan et al., 2017b; Tyne et al., 2014; Tyne, 2015; Tyne et al., 2015; Tyne et al., 2017), that chronic

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			repeated displacement and foraging disruption of populations with residency or high site fidelity can result in population-level effects. As also detailed in the Draft EIS/OEIS, however, the proposed Navy training and testing activities do not equate with the types of disturbance in the citations above nor do they rise to the level of chronic disturbance where such effects have been demonstrated. There is no evidence to suggest there have been any population-level effects in the waters around Oahu, Kauai, and Niihau or in the HSTT Study Area resulting from the same training and testing activities that have been ongoing for decades, which the comment recommends the need to stop, or at a minimum, be mitigated. In the waters around Oahu, Kauai, and Niihau, documented long-term residency by individuals and the existence of multiple small and resident populations precisely where Navy training and testing have been occurring for decades strongly suggests a lack of significant impact to those individuals and populations from the continuation of Navy training and testing.
87	Organization: O04-35	e. Critical habitat of insular false killer whales ...the Navy must protect this species, including by mitigating impacts within its critical habitat. ...we recommend that, at minimum, the Navy establish protective Mitigation Areas in all the BIAs identified for this species by NOAA, areas representing that portion of critical habitat where, based on tagging data, the whales' occurrence runs two standard deviations above the mean. This includes following the recommendations we have made elsewhere in these comments on Mitigation Areas, proposed in the DEIS, that include false killer whale BIAs (see section III.B.1.b), and ensuring that Mitigation Areas are established for the areas	As of July 24, 2018, the False Killer Whale Critical Habitat designation has been finalized (83 Federal Register 35062). The Navy was working with NMFS scientists and researchers during the identification of threats and development of the critical habitat. The critical habitat includes waters from the 45 m depth contour to the 3,200 m depth contour around the main Hawaiian Islands from Niihau east to Hawaii (82 FR 51186). With regard to the analysis of the identified Biologically Important Areas for the Main Hawaiian Islands insular false killer whales, see Section K.3.3 (False Killer Whale Small and Resident Population Area: Main Hawaiian

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		comprising the BIAs that are not currently afforded protection: i.e., the "False Killer Whale Hawaii Island" BIA in the 'Alenuihāhā Channel (see section III.B.2.ii.), and the "False Killer Whale Hawaii Island to Niihau" BIA that includes areas southeast of Lanai, southwest of Molokai, and to the northwest and northeast of Oahu.	Island Insular Stock). With regard to the identified threats to the species, see Section 3.7.2.2.7.5 (Species-Specific Threats) and specifically the documented incidental take by commercial fisheries (Bradford & Forney, 2016; Oleson et al., 2010; Reeves et al., 2009, West, 2016). NMFS has previously determined that Navy's current training and testing activities are not expected to have fitness consequences for individual MHI insular false killer whales and not likely to reduce the viability of the populations those individual whales represent. Notably, the Navy is proposing the Hawaii Island Mitigation Area and the 4-Islands Region Mitigation Area (which include the previously proposed Cautionary Areas and Planning Awareness Areas) that were developed largely based on beaked whales and on the Main Hawaiian Islands insular false killer whales.
88	Organization: O04-36	D. Identification of additional important habitat areas 1. … we therefore recommend that efforts are undertaken in an iterative manner by the Navy and NMFS to identify additional important habitat areas across the HSTT Study Area, using the full range of data and information available to them (e.g., habitat-based density models, NOAA-recognized BIAs, survey data, oceanographic and other environmental data, etc.).	Navy considered all suggested areas of potentially important habitat, as detailed in Appendix K (Geographic Mitigation Assessment) of the EIS/OEIS and in the responses to the previous comments above.
89	Organization: O04-37	(3) Stand-off distances The Navy should consider establishing stand-off distances around its Mitigation Areas to the greatest extent practicable, allowing for variability in size given the location of the Area, the type of operation at issue, and the species of concern.	The geographic and procedural mitigation areas are developed based on biological effectiveness and reducing the risk of adverse impacts to the maximum extent operationally practicable. The assessment of impacts and mitigation effectiveness considers quantitative analysis of species-specific and stressor-specific ranges to effects (see Chapter 3, Affected Environment and Environmental Consequences). Procedural and geographic mitigation areas vary in size,

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			taking into consideration location, operation, and species (e.g., the 4-Islands Region Mitigation Area is seasonal and activity- and location-specific procedural mitigation is provided via Protective Measures Assessment Protocol). The mitigation identified in Section 5.4 (Mitigation Areas to be Implemented) represents the maximum mitigation within mitigation areas and the maximum size of mitigation areas that are practical to implement under the Proposed Action. Implementing additional mitigation (e.g., stand-off distances that would extend the size of the mitigation areas) beyond what is described in Section 5.4 (Mitigation Areas to be Implemented) would be impractical due to implications for safety, sustainability, and the Navy's ability to continue meeting its requirements. The Navy's mitigation measures were reviewed and approved by a four-star Admiral, the Fleet Commander of all Navy forces in the Study Area, and Navy Senior Leadership.
90	Organization: O04-38	(4) National security exception The Navy should specify that authorization may be given only by high-level officers, consistent with the Settlement Agreement or with previous HSTT EISs.	As provided in the Draft EIS/OEIS on page 5-49, the Navy provided the technical analyses contained in Appendix K (Geographic Mitigation Assessment) that included details regarding changing the measure to the appropriate delegated Command designee (see specifically Appendix K, Section K.2.2.1 [Proposed Mitigation Areas within the HSTT Study Area], for each of the proposed areas). The commenter proposes "authorization may be given only by high-level officers" and therefore appears to have missed the designations made within the cited sections above since those do constitute positions that could only be considered "high level officers." The decision would be delegated to high-level officers. This delegation has

Table H-3: Comment Response Matrix (continued)

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			been clarified in the Final EIS/OEIS as "permission from the appropriate designated Command authority."
91	Organization: O04-39	(5) Integration of important habitat areas to improve resolution of operations While the DEIS, in assessing environmental impacts on marine mammals, breaks down estimated impacts by region, the resolution is seldom greater than range complex or homeport and is not specifically focused on areas of higher biological importance. Current and ongoing efforts to identify important habitat areas for marine mammals should be used by the Navy as a guide to the most appropriate scale(s) for the analysis of operations.	Due to the variability, the EIS/OEIS is structured to provide flexibility in training and testing locations, timing, and number. Information regarding the exact location of sonar usage is classified. Due to the variety of factors, many of which influence locations that cannot be predicted in advance (e.g., weather), the analysis is completed at a scale that is necessary to allow for flexibility. The analysis must take into account multiple Navy training and testing activities over large areas of the ocean for a 5-year period; therefore, analyzing activities in multiple locations over multiple seasons produces the best estimate of impacts/take to inform the EIS/OEIS and regulators. NMFS regulates Navy's impacts on the population of animals, not on some specific subset of the population or species. The scale at which spatially explicit density models are structured is determined by the data collection method and the environmental variables that are used to build the model. A number of variables that are meaningful to marine mammal species, such as sea surface temperature, do not vary or affect species on a fine scale. Expecting fine scale resolution from the Navy's density database may force artificial granularity on species for which it is not biologically meaningful at the population level. Therefore, given the variables that determines when and where the Navy trains and tests and the resolution of the density data, the analysis of potential impacts cannot be scaled to specific habitat areas, and is used to provide the EIS/OEIS and the regulator with the information necessary to determine potential impacts/take on a population of animals.

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92	Organization: O04-40	C. Other Mitigation and Mitigation-Related Research (1) Research into sonar signal modification 1. To our knowledge, the Navy is not presently investigating signal modification as a potential mitigation measure. Given the tangible management implications of this research, however, and the potentially broad benefits to multiple species through modification at the signal source, we strongly recommend that more research of this nature be carried out, in order to understand the extent to which these results in harbor porpoise can be generalized across species. In parallel, the feasibility of implementing signal modifications (such as those recommended above) into Navy operations should be explored. 2. We believe source modification requires greater validation across species and in more behavioral contexts before any decisions are made to alter signals—but given the preliminary data, and given the potential of this measure to reduce the instances and severity of behavioral harassment, we urge the Navy to aggressively sponsor that research.	Sonar signals are designed explicitly to provide optimum performance at detecting underwater objects (e.g., submarines) in a variety of acoustic environments. Although the Navy acknowledges that this very limited data set suggests up or down sweeps of the sonar signal may result in different animal reactions, this is a very small data sample, and this science requires further development. If future studies indicate this could be an effective approach, then Navy will investigate the feasibility and practicability to modify signals, based on tactical considerations and cost, to determine how it will affect the sonar's performance.
93	Organization: O04-41	(2) Thermal detection systems The Navy should therefore consider requiring thermal detection in optimal conditions, or, alternatively, establishing a pilot program for thermal detection, with annual review under the adaptive management system. According to the DEIS, the Navy "plans to continue researching thermal detection systems to determine their effectiveness and compatibility with Navy applications" (DEIS at 5-65). A pilot program would be consistent with that interest, while allowing for trial use as a monitoring measure. We further recommend that the Navy conduct a limited trial of thermal detection during the EIS preparation period, to determine the potential benefit for marine mammal detectability and to explore how such a system might be integrated into the Navy's present real-time marine mammal monitoring measures.	Analysis of the potential for thermal detection systems as a mitigation tool was presented in Section 5.5.2.3 (Increasing Passive Acoustic Monitoring and Visual Observations). The Office of Naval Research Marine Mammals and Biology program is currently funding an ongoing project (2013–2018) that is testing the thermal limits of infrared based automatic whale detection technology (Principal Investigators: Olaf Boebel and Daniel Zitterbart). This project is focused on (1) capturing whale spouts at two different locations featuring subtropical and tropical water temperatures, (2) optimizing detector/classifier performance on the collected data, and (3) testing system performance by comparing system detections with concurrent visual observations. In addition, Defense Advanced Research

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			Projects Agency (DARPA) has funded six initial studies to test and evaluate current technologies and algorithms to automatically detect marine mammals (IR thermal detection being one of the technologies) on an unmanned surface vehicle. Based on the outcome of these initial studies, follow-on efforts and testing are planned for 2018–2019. The Navy plans to continue researching thermal detection systems to determine their effectiveness and compatibility with Navy applications. If the technology matures to the state where thermal detection is determined to be an effective mitigation tool during training and testing, the Navy will assess the practicability of using the technology during training and testing events and retrofitting its observation platforms with thermal detection devices.
94	Organization: O04-42	(3) Mitigation and research on Navy ship speeds 1. the Navy does not meaningfully consider ship-strike mitigation in its San Diego Arc mitigation areas, to reduce risk to endangered blue whales in an area of manifest biological importance. We urge the Navy to conduct a practicability analysis and implement vessel speed mitigation in this and other areas. 2. we recommend that the Navy collect data on ship speed and report them to NMFS as part of the EIS process.	The Navy has considered ship strike mitigation in the San Diego Arc. This analysis is presented in Section K.4.1.6 (San Diego [Arc] Blue Whale Feeding Area; Settlement Areas 3-A through 3-C, California Coastal Commission 3 NM Shore Area, and San Diego Arc Area), Section K.5.5 (Settlement Areas within the Southern California Portion of the HSTT Study Area), and Section K.6.2 (San Diego Arc: Area Parallel to the Coastline from the Gulf of California Border to just North of Del Mar). See Section 5.3.4.1 (Vessel Movement) regarding the general procedural mitigation to be implemented regarding vessel speed and movement. The Navy will implement additional mitigation within the San Diego Arc, as detailed in Section 5.4.3 (Mitigation Areas for Marine Mammals in the Southern California Portion of the Study Area), to further avoid or reduce impacts on marine mammals from acoustic and explosive stressors and

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			vessel strikes from Navy training and testing in this location. There have been no Navy vessel strikes with blue whales in Southern California or anywhere in the Pacific in records that date back to 1995. The Navy conducted an operational analysis of potential mitigation areas throughout the Study Area to consider a wide range of mitigation options, including but not limited to vessel speed restrictions. The Navy has not imposed vessel speed restrictions in the San Diego Arc due to safety (ability to avoid potential hazards) and sustainability (military readiness). Regarding the recommended additional Navy collection of data on ship speed and reporting that data to NMFS, see the discussion in Section 5.5.7 (Reporting Requirements). The Navy developed its reporting requirements in conjunction with NMFS. As directed by the Chief of Naval Operations Instruction (OPNAVINST) 5090.1D, Environmental Readiness Program, Navy vessels report all marine mammal incidents worldwide.
95	Organization: O04-43	(4) On-range passive acoustic sensors 1. the Navy claims that it lacks the capacity to monitor instrumented ranges in real time for mitigation purposes. As the Commission notes, that capacity "clearly exists," and the Navy has made no serious effort in its DEIS to analyze what is plainly a viable, significant form of mitigation.	Although the U.S. Navy Marine Species Monitoring Program has sponsored numerous studies that have produced meaningful results on marine mammal occurrence, distribution, and behavior at its instrumented ranges (see Section 5.1.2.2.1, Marine Species Research and Monitoring Programs), the Navy's instrumented ranges were not developed for the purpose of mitigation. For example, beaked whales produce highly directed echolocation clicks that are difficult to simultaneously detect on multiple hydrophones within the instrumented range at PMRF; therefore, there is a high probability that a vocalizing animal would be assigned a false location on the range

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			(i.e., the Navy would not be able to verify its presence in a mitigation zone). Although the Navy is continuing to improve its capabilities to use range instrumentation to aid in the passive acoustic detection of marine mammals, at this time it would not be effective or practicable for the Navy to monitor instrumented ranges for the purpose of real-time mitigation for the reasons discussed in Section 5.5.3 (Active and Passive Acoustic Monitoring Devices).
96	Organization: O04-44	(5) Compensatory mitigation 1. the Navy should consider adopting compensatory mitigation to help improve the conservation status or habitat of affected populations. The Navy should consider compensatory mitigation for the adverse impacts of the permitted activity on marine mammals and their habitat that cannot otherwise be prevented or mitigated.	As indicated previously, the Navy has for years implemented a very broad and comprehensive range of measures to mitigate potential impacts on marine mammals from military readiness activities. As the EIS/OEIS documents in Chapter 5 (Mitigation), the Navy is increasing its mitigation measures to enhance marine mammal protections to the maximum extent practicable. The Navy would also assert that based on the analysis presented in the EIS/OEIS, Navy training and testing activities would not have significant adverse impacts to marine habitats, in general. In regards to species conservation, aside from direct mitigation, as noted by the comment, the Navy engages in an extensive spectrum of other activities that greatly benefit marine species in a more general manner that is not necessarily tied to just military readiness activities. As noted in Section 3.0.1.1 (Marine Species Monitoring and Research Programs), the Navy provides extensive investment for programs in basic and applied research. In fact, the U.S. Navy is one of the largest sources of funding for marine mammal research in the world, which has greatly enhanced the scientific community's understanding of marine species much more generally. The Navy's support and conduct of cutting-edge marine

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			mammal research includes marine mammal detection, including the development and testing of new autonomous hardware platforms and signal processing algorithms for detection, classification, and localization of marine mammals; improvements in density information and development of abundance models of marine mammals; and advancements in the understanding and characterization of the behavioral, physiological (hearing and stress response), and potentially population-level consequences of sound exposure on marine life. For the 5-year period from 2013–2017, U.S. Pacific Fleet on behalf of the U.S. Navy funded $14.2M in marine species monitoring within Hawaii and Southern California. This amount does not include several hundred thousand to million dollars per year funded by the Navy's basic research program under the Office of Naval Research or the Navy's advanced research Living Marine Resources program. Both of these programs fund marine species research with field efforts conducted in the HSTT Study Area. Annual expenditures from all Navy programs can be variable and are dictated by Congressional approved funds, and Pacific-wide monitoring commitments decided with NMFS during the adaptive management process. Regarding compensatory mitigation, as a matter of law compensatory mitigation is not required or authorized to be imposed upon federal agencies under the ESA. For federal agencies (which are not subject to Section 10 permits where applicants must minimize and mitigate impacts), FWS/NMFS can only require measures that comport with the minor change rule and seek to minimize take, not "mitigate" (in the sense of compensatory mitigation; see pages 4-19 and 4-50 of

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			Consultation Handbook). Similarly, there is no provision in the MMPA that provides for compensatory mitigation, and no NMFS policy that directs compensatory mitigation for any applicant. Additionally, the commenter did not recommend any specific measure(s), rendering it impossible to conduct any meaningful evaluation of their recommendation. The vast majority of Navy takes of marine mammals are relatively minor and temporary behavioral reactions that do not have measurable long-term or permanent impacts to stocks or species. The Navy is unaware of any proven or effective mechanisms for using compensatory mitigation for offsetting temporary behavioral reactions to marine mammals. Many of the methods of compensatory mitigation that have proven successful in terrestrial settings (purchasing or preserving land with important habitat, improving habitat through plantings, etc.) are not applicable in a marine setting with such far-ranging species. Thus, any presumed conservation value from such an idea would be purely speculative at this time. Given the level of current and future research on marine species within HSTT from multiple Navy programs, the Navy asserts that the most scientifically rigorous process is already in place in terms of HSTT species conservation.
97	Organization: O04-45	D. Long-term monitoring 1. In addition to continuing to make funds available to support long-term monitoring studies, we recommend that the Navy's monitoring program expand funding for projects that aim to quantify the impact of Navy activities at the individual, and, ultimately, population level. First, detailed, individual-level behavioral-response studies, such as focal follows and tagging using DTAGs, carried out before, during, and after Navy	The Navy established the Strategic Planning Process under the marine species monitoring program to help structure the evaluation and prioritization of projects for funding. Section 5.1.2.2.1.3 (Strategic Planning Process) provides a brief overview of the Strategic Planning Process. More detail, including the current intermediate scientific objectives, is available on the monitoring portal as well as in the Strategic Planning Process report. The

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		operations, can provide important insights for these species and stocks and we encourage the Navy to expand funding for certain of these projects. Second, recent studies using DTAGs have also been used to characterize social communications between individuals of a species or stock, including between mothers and calves; we recommend that the Navy prioritize funding studies that further characterize the suite of vocalizations related to social-interactions. Third, the use of unmanned aerial vehicles are also proving useful for surveying marine species, and may provide a less invasive approach to undertaking focal follows. Imagery from unmanned aerial vehicles can also be used to assess body condition and, in some cases, health of individuals. We recommend that the Navy make funds available to use these technologies for assessing marine mammal behavior before, during, and after Navy operations (e.g. swim speed and direction, group cohesion). In addition, studies into how these technologies can be used to assess body condition should be supported as this can provide an important indication of energy budget and health, which can inform the assessment of population-level impacts.	Navy's evaluation and prioritization process is driven largely by a standard set of criteria that helps the steering committee evaluate how well a potential project would address the primary objectives of the monitoring program. NMFS has opportunities to provide input regarding the Navy's intermediate scientific objectives as well as providing feedback on individual projects through the annual program review meeting and annual report. For additional information, please visit: https://www.navymarinespeciesmonitoring.us/about/strategic-planning-process/. Details on the Navy's involvement with future research will continue to be developed and refined by Navy and NMFS through the consultation and adaptive management processes, which regularly considers and evaluates the development and use of new science and technologies for Navy applications. The Navy will continue to be a leader in funding of research to better understand the potential impacts of Navy training and testing activities and to operate with the least possible impacts while meeting training and testing requirements.
98	Organization: O04-46	We therefore recommend the Navy expand funding to explore the utility of other, simpler modeling methods that could provide at least an indication of population-level effects, even if each of the behavioral and physiological mechanisms are not fully characterized. The modeling approach undertaken by researchers for beaked whales in the California Current offers one such example. Here a Bayesian hidden-process modeling approach was used to estimate abundance and population trends of beaked whales using sightings data from six ship-based, line-transect, cetacean abundance surveys between	The Office of Naval Research Marine Mammals and Biology program has invested in the Population Consequences of Disturbance (PcoD) model, which provides a theoretical framework and the types of data that would be needed to assess population-level impacts. Therefore, in the future, relevant data that is needed for improving the analytical approaches for population-level consequences resulting from disturbances will be collected during projects funded by the Navy's marine species monitoring program. General

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		1991 and 2008. Model results indicated that Cuvier's beaked whales were experiencing an average rate of decline at 2.9% per year... we encourage the Navy to contribute increased funds to studies aimed at exploring other potential proxy measures of changes in population-level abundance and demographics, in order to develop an early-detection system for populations that may be experiencing a decline as a result of Navy activities.	population-level trend analysis is conducted by NMFS through their stock assessment reports and regulatory determinations. The Navy's analysis of effects to populations (species and stocks) of all potentially exposed marine species, including marine mammals and sea turtles, is based on the best available science as discussed in Sections 3.7 (Marine Mammals) and 3.8 (Reptiles). PcoD models, similar to many fisheries stock assessment models, once developed, will be powerful analytical tools when mature. However, currently they are dependent on too many unknown factors for these types of models to produce a reliable answer. Additionally, the citation in the comment does not reflect the most recent or the best available science and does not acknowledge the extensive findings discussed in the Draft EIS/OEIS specific to the area where Navy has conducted training and testing for decades; see Section 3.7.2.3.24.3 (Populations Trends) for discussion of that citation (Moore and Barlow 2013). The citation postulated there was a "decline" for beaked whales over the entire U.S. West Coast; however, there is no evidence whatsoever that beaked whales were experiencing any decline in the HSTT Study Area. In fact, in 2016 one of the authors (see Barlow (2016)) now questions the previously postulated decline based on a more recent (2014) survey, when considering the portion of the beaked whale population within the Southern California portion of the HSTT Study Area, multiple Navy-funded studies have documented there is a continued high abundance of beaked whales specifically where Navy has been training and testing for decades; see Debich et al., 2015a; Debich et al., 2015b; Falcone & Schorr, 2012, 2014; Hildebrand et al., 2009;

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			Moretti, 2016; Širović et al., 2016; Smultea & Jefferson, 2014. While not available during the development of the HSTT Draft EIS/OEIS, additional new Navy-funded studies continue to point to a steady occurrence of beaked whales in HSTT (Rice et al., 2017; Širović, et al., 2017; Rice et al. 2018). Moore & Barlow (2017) incorporated NMFS' latest U.S. West Coast survey data through 2014 in a revised Bayesian beaked whale trend analysis. The authors commented that when including the 2014 data that "Cuvier's beaked whales appear to have decreased in abundance from high values in 1991-93, but that decline now appears to have leveled off." In addition, Moore & Barlow (2013, 2017) draw their Bayesian trend analysis from data along the entire U.S. West Coast including a significant portion of the U.S. EEZ and coast where the Navy does not conduct in-water training. This demonstrates a measured approach to population-level modeling is required, which is the approach Navy has taken as described in detail above. Navy training and testing have taken place in SOCAL for decades and there have been no indications of population-level impacts. The most recent survey findings (Moore and Barlow 2017) encountered the highest estimated abundance of beaked whales in the California Current since 1991 and multiple other survey, monitoring, and research efforts continue to encounter long-term resident individuals and populations of beaked whales in higher densities on the SOCAL Range Complex where active sonar has been in use for decades, than anywhere else off California; see for example citation in the Draft EIS/OEIS to Debich et al., 2015a; Debich et al., 2015b; Falcone & Schorr, 2012, 2014; Hildebrand et al., 2009; Moretti, 2016; Širović et al., 2016; Smultea &

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
			Jefferson, 2014. Additionally, the Navy has provided significant monitoring and research funding regarding beaked whales in SOCAL for more than 15 years, resulting in significant advancements in understanding beaked whale ecology and potential effects of Navy's activities. Although not available at the time of the Draft EIS/OEIS, the newest Navy-funded reporting on SOCAL beaked whales documents steady Cuvier's beaked populations co-existing in Navy training and testing areas (Schorr et al., 2018, Moretti 2017, DiMarzio et al., 2018). In terms of marine mammal research, including beaked whales, for the 5-year period from 2013 to 2017, U.S. Pacific Fleet on behalf of the U.S. Navy funded $14.2M in marine species monitoring within HSTT (Hawaii and Southern California). This amount does not include several hundred thousand to million dollars per year funded by the Navy's basic research program under the Office of Naval Research or the Navy's advanced research Living Marine Resources program. Both of these programs fund marine species research with field efforts conducted in the HSTT Study Area. These efforts are planned to continue through the duration of the next HSTT MMPA permit cycle using a variety of passive acoustic, visual, tagging, photo ID, and genetics research tools. This effort is in addition and complementary to any planned NMFS efforts for beaked whales and other marine mammals along the US West Coast including Southern California. For additional information on Navy's monitoring program visit: https://www.navymarinespeciesmonitoring.us.
99	Organization: O04-47	A. Impact assessment from individual stressors (1) Post-modeling analysis of Level A injury and mortality	Sound levels diminish quickly below levels that could cause PTS. Studies have shown that all animals observed avoid areas well beyond these zones; therefore, the vast

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
		While it's certainly true that some marine mammals will flee the sound, there are no data to inform us how many would do so, let alone that 95% would move as expeditiously as the Navy presumes. Marine mammals may remain in important habitat, and the most vulnerable individuals may linger in an area, notwithstanding the risk of harm; marine mammals cannot necessarily predict where an exercise will travel; and Navy vessels engaged in certain activities may move more rapidly than a marine mammal that is attempting to evacuate.	majority of animals are likely to avoid sound levels that could cause injury to their ear. Behavioral response literature, including the recent 3S and SOCAL BRS studies, indicate that the multiple species from different cetacean suborders do in fact avoid approaching sound sources by a few hundred meters or more, which would reduce received sound levels for individual marine mammals to levels below those that could cause permanent threshold shift (PTS). A detailed analysis, including information on swim speeds, is provided in the technical report *Quantifying Acoustic Impacts on Marine Mammals and Sea Turtles: Methods and Analytical; Approach for Phase III Training and Testing*. Nevertheless, some animals could be caught off-guard at the beginning of, or after a pause in a training or testing event. Therefore, the Navy acknowledges that some animals could receive permanent threshold shift and has estimated these impacts in the analysis. Avoidance adjustments to the raw output from the Navy Acoustic Effects Model are necessary because, as described in the EIS/OEIS in Section 3.7.3.1.2.1 (Methods for Analyzing Impacts from Sonars and Other Transducers) and Section 3.7.3.2.2.1 (Methods for Analyzing Impacts from Explosives), animats (i.e., computer representations of individual marine mammals) in the model are not programmed to avoid sound sources or move horizontally in any way.
100	Organization: O04-48	The Navy's adjustment of injury and mortality numbers for "mitigation effectiveness" is also problematic. The DEIS starts with the species-specific g(0) factors applied in professional marine mammal abundance surveys, then multiplies them by a simple factors to reflect the relative effectiveness of its lookouts in routine operating conditions. Yet the Navy's sighting	Information about the quantitative analysis process, including the consideration of mitigation effectiveness, is described in detail in the technical report *Quantifying Acoustic Impacts on Marine Mammals and Sea Turtles: Methods and Analytical Approach for Phase III Training and Testing*. The Navy quantitatively assessed the

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
		effectiveness is likely to be much poorer than that of experienced biologists dedicated exclusively to marine mammal detection, operating under conditions that maximize sightings. As one recent paper observed, for example, abundance survey rates declined significantly as sea states rose above Beaufort 1,133 and average Beaufort sea states in areas proximate to Navy activities within the HSTT Study Area averaged Beaufort 4-5 throughout the year (see Table 1). Given this, and given that most Navy activities would be allowed to occur in all sea conditions and hours of day, it seems seldom that Navy visual surveys can approximate the sighting effectiveness of a large-vessel abundance survey.	effectiveness of its mitigation measures on a per-scenario basis for four factors: (1) species sightability, (2) a Lookout's ability to observe the range to permanent threshold shift (for sonar and other transducers) and range to mortality (for explosives), (3) the portion of time when mitigation could potentially be conducted during periods of reduced daytime visibility (to include inclement weather and high sea-state) and the portion of time when mitigation could potentially be conducted at night, and (4) the ability for sound sources to be positively controlled (e.g., powered down). The g(0) values used by the Navy for their mitigation effectiveness adjustments take into account the differences in sightability with sea state, and utilize averaged g(0) values for sea states of 1–4 and weighted as suggested by Barlow (2015). This helps to account for reduced sightability in varying conditions, as does the fact that, during active sonar activities, Navy lookouts tend to look in the water near the vessel, within 1 km, rather than out to the horizon as marine mammal observers do, and they only need to see one animal to effectively mitigate for all animals in the mitigation zone. During the conduct of training and testing activities, there is typically at least one, if not numerous, support personnel involved in the activity (e.g., range support personnel aboard a torpedo retrieval boat or support aircraft). In addition to the Lookout posted for the purpose of mitigation, these additional personnel observe for and disseminate marine species sighting information amongst the units participating in the activity whenever possible as they conduct their primary mission responsibilities. However, as a conservative approach to assigning mitigation effectiveness factors,

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
			the Navy elected to account only for the minimum number of required Lookouts used for each activity; therefore, the mitigation effectiveness factors may underestimate the likelihood that some marine mammals and sea turtles may be detected during activities that are supported by additional personnel who may also be observing the mitigation zone.
101	Organization: O04-49	(2) Behaviorally-mediated injury and mortality For purposes of this analysis, the Navy should assume that beaked whales are subject to both acute and chronic injury from gas-bubble formation under certain conditions of sonar exposure.	Nitrogen decompression is discussed in the EIS/OEIS in Section 3.7.3.1.1.1 (Marine Mammals – Injury – Nitrogen Decompression). This section discusses the background of potential impacts to marine mammals—and specifically beaked whales—from Acoustic stressors, such as sonar, and outlines the literature currently available with regards to this potential impact.
102	Organization: O05-05	Further, the DEIS is deficient in addressing the following significant issues: • it lacks a process for verifying the independence of its observer program and a fire wall to insure the objectivity and independence of the observer reports;	The U.S. Navy does not have an "observer program" similar to that of NOAA fisheries. Section 5.5.2.3 (Increasing Passive Acoustic Monitoring and Visual Observations) states the reasons why independent observers are generally not present on U.S. Navy vessels. However, independent scientists are and have been an integral part of the research program that has been ongoing for over a decade in Hawaii as presented in Section 3.0.1.1 (Marine Species Monitoring and Research Programs) and Section 5.1.2.2.1 (Marine Species Research and Monitoring Programs).
103	Organization: O07-05	A few of these flawed assumptions are: • Mitigation measures are adequate and will effectively protect marine mammals and sea turtles during Navy HSTT activities.	The Navy's mitigation represents the maximum mitigation that is likely to be effective and practicable to implement while still meeting the purpose and need of the Proposed Action. The mitigation measures that will be implemented for Phase III includes a continuation of 2015 HSTT-related settlement agreement measures that are biologically supported and practical to implement relative to Navy training and testing requirements, as

Table H-3: Comment Response Matrix (continued)

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			well as the development of several new mitigation areas, and an expansion of the Humpback Whale Cautionary Area (renamed the 4-Islands Region Mitigation Area). These mitigation areas were designed based on the best available science covering marine mammal densities and monitoring and research data, and overlap with the biologically important areas identified by Van Parijs et al. (2015) for numerous species and stocks, including small and resident populations of various marine mammals. Overall, the mitigation measures that will be implemented for Phase III represents an increase over what was developed for Phase II and, in some cases, those measures set forth in the 2015 HSTT-related settlement agreement. In addition to mitigation areas, the Navy will implement procedural mitigation for acoustic sources (including active sonar), explosives, and physical disturbance and strike stressors whenever and wherever these activities take place within the Study Area, as described in Section 5.3 (Procedural Mitigation to be Implemented). The Navy determined that implementing mitigation beyond what is described in Section 5.3 (Procedural Mitigation to be Implemented) and Section 5.4 (Mitigation Areas to be Implemented) would be impracticable due to implications for safety, sustainability, and Title 10 requirements for the reasons that are more fully described in Appendix K (Geographic Mitigation Assessment) and Chapter 5 (Mitigation).
104	Organization: O07-10	Mitigation Measures The Navy continues to make much of its mitigation measures. However, in the real world, these measures can only be seen as thoroughly ineffective. The effectiveness of visual detection, either from trained observers aboard ships and surfaced submarines, or from	The use of Lookouts or other similar observers to detect marine mammals within a mitigation zone is a standard practice across many industries, including within the field of acoustic research. In coordination with NMFS, the Navy developed its procedural mitigation to avoid or reduce injurious impacts to the maximum extent

Table H-3: Comment Response Matrix (continued)

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		trained observers in aircraft, is extremely limited by a number of factors. It is well known that many marine mammal species can remain submerged below the surface of the water, some for quite extended periods of time. Sperm whales, for example, can remain submerged for well over an hour. Dive times of 87 minutes have been recorded for Cuvier's beaked whales (Baird et al., 2004; Baird et al., 2005b). When below the water's surface, marine mammals (and sea turtles) can become impossible to visually detect from ships, submarines, and aircraft. While submerged, these animals do not necessarily remain in the same location. So, even if they have been visually detected while at the surface, once submerged, visual detection of these animals ceases to be effective, and their location is unknown. Given the duration periods a number of these species can remain submerged, and the distances they can travel while submerged, visual detection is an extremely unreliable method for determining whether or not these animals are in a given area even under the very best of ocean and weather conditions. In choppy or rough seas, it is often extremely difficult to visually detect marine mammals even when they are at the surface. Weather conditions can further contribute to this difficulty. It is estimated for example, that sighting rates for beaked whales are only about two percent (Barlow and Gisiner, 2004). Additionally, HSTT activities will be conducted both day and night. During night time, visibility is obviously decreased dramatically, even if Night Lookout Techniques are employed. Because of these factors, visual detection of marine mammals, as well as sea turtles, is extremely unreliable even for highly trained and highly motivated individuals. Because the Navy's mitigation measures depend to such a large extent on visual detection of marine mammals and sea turtles, a method that is clearly unreliable, they can in no way reasonably be seen as being effective.	practicable. The size of the mitigation zones for each stressor or activity category were determined by numerous factors, including but not limited to the ranges to potential injury and the largest areas within which Lookouts can safely and effectively maintain situational awareness while visually observing the mitigation zones during typical activity conditions. As discussed in Chapter 5 (Mitigation) of the Final EIS/OEIS, the Navy's quantitative analysis assumes that Lookouts will not be 100 percent effective at detecting all species for every activity. This is due to the inherent limitations of observing marine species and because the likelihood of sighting individual animals is largely dependent on observation conditions (e.g., time of day, sea state, mitigation zone size, observation platform) and animal behavior (e.g., the amount of time an animal spends at the surface of the water). This is particularly true for sea turtles, small marine mammals, and marine mammals that display cryptic behaviors (e.g., surfacing to breathe with only a small portion of their body visible from the surface). Information about the quantitative analysis process, including the consideration of mitigation effectiveness, is described in detail in the technical report titled *Quantifying Acoustic Impacts on Marine Mammals and Sea Turtles: Methods and Analytical Approach for Phase III Training and Testing*. The Navy quantitatively assessed the effectiveness of its mitigation measures on a per-scenario basis for four factors: (1) species sightability, (2) a Lookout's ability to observe the range to permanent threshold shift (for sonar and other transducers) and range to mortality (for explosives), (3) the portion of time when mitigation could potentially be conducted

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			during periods of reduced daytime visibility (to include inclement weather and high sea-state) and the portion of time when mitigation could potentially be conducted at night, and (4) the ability for sound sources to be positively controlled (e.g., powered down). The g(0) values used by the Navy for their mitigation effectiveness adjustments take into account the differences in sightability with sea state, and utilize averaged g(0) values for sea states of 1–4 and weighted as suggested by Barlow (2015). This helps to account for reduced sightability in varying conditions, and species-specific dive profiles and behaviors. In addition to implementing procedural mitigation, the Navy is expanding the existing Phase II Humpback Whale Cautionary Area (renamed the 4-Islands Region Mitigation Area) and developing several new mitigation areas to avoid or reduce potential impacts to marine mammals. The Navy determined that implementing mitigation beyond what is described in Section 5.3 (Procedural Mitigation) and Section 5.4 (Mitigation Areas to be Implemented), such as increasing mitigation zone sizes to encompass the predicted ranges to behavioral impacts, would be impracticable due to implications for safety, sustainability, and Title 10 requirements for the reasons that are more fully described in Appendix K (Geographic Mitigation Assessment) and Chapter 5 (Mitigation).
105	Organization: O07-11	In those cases where marine mammals or sea turtles are actually detected, the mitigation zones are simply far too small to provide those animals adequate protection, especially when considering the fact that on a number of occasions, animals have been injured and have died as a result of their exposer to sonar noise at far greater distances from the source than these	The Navy and NMFS determined that the mitigation zones for active sonar are adequate and will avoid or reduce injurious impacts to the maximum extent practicable. The Navy mitigation zones represent the maximum surface area the Navy can effectively observe based on the platform involved, number of personnel

Table H-3: Comment Response Matrix (continued)

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		zones. These so-called mitigation zones are entirely inadequate, and do not offer marine mammals or sea turtles any real protection against harm.	that will be involved, and the number and type of assets and resources available. As mitigation zone sizes increase, the potential for observing marine mammals and thus reducing impacts decreases, because the number of observers can't increase although the area to observe increases. For instance, if a mitigation zone increases from 1,000 to 2,000 yd., the area that must be observed increases four-fold. The Navy mitigation measures balance the need to reduce potential impacts with the ability to provide effective observations throughout a given mitigation zone. In this way, while it is technically feasible to instruct lookouts to attempt to cover double the range, it would not have mitigation value. The mitigation zones for active sonar extend beyond the average ranges to Permanent Threshold Shift (PTS) for all functional hearing groups for the sonar sources with the longest predicted ranges to PTS. For instance, for a hull-mounted surface ship sonar, range to PTS is 71 yards for low-frequency cetaceans such as baleen whales and 17 yards for mid-frequency cetaceans such as a beaked whales or dolphins. Implementing the mitigation will likely also help avoid or reduce threshold shifts that are recoverable (i.e., Temporary Threshold Shift [TTS]). Range to TTS for low-frequency cetaceans is 987 yards and for mid-frequency cetaceans 230 yards. The mitigation would be even more protective for active sonar sources used at lower source levels or that fall within lower source bins with shorter impact ranges. Furthermore, implementation of procedural mitigation is most effective when mitigation zones are appropriately sized to be realistically observed during typical training and testing activity conditions. The Navy determined that increasing the mitigation zone sizes for active sonar

Table H-3: Comment Response Matrix (continued)

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			activities beyond what is described in Section 5.3 (Procedural Mitigation to be Implemented) would be impracticable due to implications for safety, sustainability, and Title 10 requirements for the reasons more fully described in Chapter 5 (Mitigation).
106	Organization: O07-12	As is well known, one of the most effective mitigation measures that can be implemented is to simply avoid carrying out sonar and explosives training and testing activities in important habitats for vulnerable species. And yet, even though the Navy has, to a degree done this, for the last several years under the settlement agreement that came about as a result of Conservation Council for Hawaii v. National Marine Fisheries Service, and without ever claiming that doing so interfered with military readiness, it now wishes to do away with some habitat protections altogether as well as reducing protections in other areas. There is no justification for this. As has occurred in the past in other sonar-related EISs, the Navy, in this Draft EIS/OEIS, simply eliminates a number of mitigation measures, generally offering only very weak arguments as to how these measures would have an unacceptable Impact on its training and testing activities. Essentially, the Navy wants to train and test exactly as it wishes, and any measure that might alter this in even a minute manner is simply dismissed, even if that measure would dramatically reduce negative impacts. This failure of mitigation does not achieve the least practicable adverse impact on marine mammals. For all these reasons, the Navy's mitigation measures remain unnecessarily ineffective, and will most likely result in far greater negative impacts than estimated and need be.	Following the publication of the 2013 Hawaii-Southern California Final EIS/OEIS, a 2015 HSTT-related settlement agreement prohibited or restricted Navy activities within specific areas in the HSTT Study Area. Under the terms of the settlement agreement executed by the parties in September 2015, the Navy agreed to prohibit or restrict the use of certain hull-mounted active sonar and in-water explosives within defined areas until the current authorizations under MMPA and ESA expire on December 24, 2018, or the earlier issuance of superseding environmental compliance documents. While certain time and area restrictions were agreed to in the HSTT settlement, these measures were not selected based on scientific or operational analyses, but instead were agreed to as temporary measures. As such, the settlement and its terms were never intended to be a framework for how the Navy develops or implements future mitigation (including for Phase III). To develop mitigation for Phase III of the HSTT EIS/OEIS (i.e., the environmental compliance document that supersedes the 2015 HSTT-related settlement agreement), the Navy completed a biological assessment and operational analysis of potential mitigation areas throughout the entire Study Area. During the Phase III mitigation development process, the Navy determined that implementing all settlement agreement measures under the Proposed Action would be impracticable due to implications for safety, sustainability, and Title 10

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
			requirements for the reasons more fully described in Appendix K (Geographic Mitigation Assessment). The mitigation that will be implemented for Phase III includes a continuation of some settlement agreement measures, as well as the development of several new mitigation areas, and an expansion of the Humpback Whale Cautionary Area (renamed the 4-Islands Region Mitigation Area). Overall, the mitigation that will be implemented for Phase III represents an increase over what was developed for Phase II and, in some cases, those measures set forth in the 2015 HSTT-related settlement agreement. The Navy's procedural mitigation and mitigation areas for marine mammals are specifically designed to have the least practicable adverse impact on marine mammal populations or stocks, ensuring a negligible impact on marine mammal species and stocks (as required under the Marine Mammal Protection Act), and ensuring that Navy training and testing activities do not jeopardize the continued existence of endangered or threatened species, or result in destruction or adverse modification of critical habitat (as required under the Endangered Species Act). The Navy will implement procedural mitigation for 19 stressors or activity categories and will implement numerous mitigation areas within the Study Area to further avoid or reduce impacts on marine mammals. The emphasis for mitigation development is that a measure must meet the appropriate balance of being effective at avoiding or reducing impacts from the Proposed Action while being practicable to implement. The criteria considered when determining practicability of implementation are detailed in Section 5.2.3 (Practicability of Implementation) and discussed

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
			throughout Chapter 5 (Mitigation). The Navy determined that increasing the mitigation zone sizes for active sonar activities beyond what is described in Section 5.3 (Procedural Mitigation to be Implemented) would be impracticable due to implications for safety, sustainability, and Title 10 requirements for the reasons more fully described in Chapter 5 (Mitigation).
107	Organization: O15-05	There are over twenty different marine mammals that live in the Hawaiian waters. Many are endangered, some on the brink of extinction. Posting an observer on the deck and calling it mitigation for active sonar, is so absurd that it is silly. The Hawaiian Islands are no place for active sonar practice. RIMPAC should be canceled because mitigation cannot be done to obey the Marine Mammal Preservation Act. Here in Hawai'i on the island of Kaua'i, we would like a specific EIS for the activities of the Pacific Missile Range Facility (PMRF.) It is a known training range for submarines, yet the public knows next to nothing about what goes on there from year to year. This is especially true during the RIMPAC exercises. Everything the Navy does is, in the long run, designed to kill or maim. The citizens of Kaua'i, especially tour boat operators and fishermen have a right to know the environmental impacts in their neighborhood.	As described in Chapter 5 (Mitigation) of the EIS/OEIS (especially Section 5.2, Mitigation Development), the Navy evaluated the effectiveness and practicability of numerous potential mitigation measures. Note that Navy does not employ only visual monitoring, but also makes use of passive acoustic detection when available and appropriate. On Navy ships, hand-held binoculars are always available and pedestal mounted binoculars, very similar to those used in marine mammal surveys, are generally available to Navy Lookouts on board vessels over 60 feet. Also like marine mammal observers, Navy Lookouts are trained to use a methodical combination of unaided eye and optics as they search the surface around a vessel. In addition to designated Lookouts, there are always additional bridge watch personnel observing the water around the vessel. Finally, visual mitigation has been demonstrated to be an effective component of the Navy's mitigation measures over years of monitoring associated with Navy training and testing at sea in publically available reports submitted to NMFS since 2006 and accessible on the NMFS Office of Protected Resources website. The Navy is consulting with NOAA under the Marine Mammal Protection Act (MMPA) and Endangered Species Act (ESA) for marine mammals, including monk seals and USFWS for sea turtles and seabirds. Those

Table H-3: Comment Response Matrix (continued)

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			consultations will result in a Final Rule and a Letter of Authorization under MMPA and a Biological Opinion (containing an Incidental Take Permit) or Letter of Concurrence under ESA.
108	Individual: HOLGR-01	Fishermen have been concerned about being told to leave the Middle Bands 80 mi. NW of Kauai. It takes 10 hours to reach this location and once there is nowhere to go except Niihau or Kaula 50 miles away. Our trips are $1,500 in expenses and this is very impactful on our lives. Please find a way to exclude this Bank from your bombing range.	The Navy strives to conduct training and testing in a manner compatible with commercial and recreational ocean users. The waters described in the comment are not restricted waters, and the Navy does not prevent fishing boats or other non-Navy vessels from operating in the area. As stated in the Draft EIS/OEIS in Section 3.12.3.3 (Physical Interactions), "Both Navy and public vessels operate under maritime navigational rules requiring them to observe and avoid other vessels. In addition, Notices to Mariners advise vessel operators about when and where Navy training and testing activities are scheduled. Finally, Navy personnel are required to verify that the range is clear of non-participants before initiating any potentially hazardous activity. Together, these procedures minimize the potential for adverse interactions between Navy and non-participant vessels."
109	Individual: HOLGR-02	Could you set up an email notification for military activity at Kaula Island so we can know of any target practice activities before we go out. This would help both the fishermen and military have less issues with clearing the area.	Per 33 CFR 334.1325, there is a continuous 3 nautical mile exclusion area around Kaula Island. It is restricted at all times, so the Navy's activities would not change that.
110	State: S05-01	The Division of Aquatic Resources (DAR) for the State of Hawaii Department of Land and Natural Resources (DLNR) recommends that the Department of the Navy take further steps to reduce, minimize or eliminate the proposed behavioral, TTS (temporary threshold shifts) or PTS (permanent threshold shifts) takes, in biologically important areas (identified in the DEIS), for all cetaceans listed in order to reduce the risk of mortality to these cetaceans as a result of these activities.	The Navy has taken further steps to avoid or reduce potential impacts to marine mammals under the Proposed Action. The mitigation that will be implemented for Phase III includes a continuation of some 2015 HSTT-related settlement agreement measures, as well as the development of several new mitigation areas, and an expansion of the Humpback Whale Cautionary Area (renamed the 4-Islands Region

Table H-3: Comment Response Matrix (continued)

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		Although mitigative steps have been proposed, the exposure of certain populations to sonar and other transducers is predicted to occur at rates that are detrimental to vulnerable populations. Select vulnerable populations are discussed below, but DAR recommends adjustments to the utilization of areas that overlap biologically important areas and/or modifications to the training and testing of certain acoustic and explosive weapons and detection or navigational aids.	Mitigation Area). These mitigation areas were designed based on marine mammal densities and monitoring and research data, and overlap with the biologically important areas identified by Van Parijs et al. (2015) for numerous species and stocks, including small and resident populations. Overall, the mitigation that will be implemented for Phase III represents an increase over what was developed for Phase II and, in some cases, the measures set forth in the 2015 HSTT-related settlement agreement. In addition to mitigation areas, the Navy will implement procedural mitigation for acoustic sources (including active sonar), explosives, and physical disturbance and strike stressors whenever and wherever these activities take place within the Study Area, as described in Section 5.3 (Procedural Mitigation to be Implemented). The Navy determined that implementing mitigation beyond what is described in Section 5.3 (Procedural Mitigation to be Implemented) and Section 5.4 (Mitigation Areas to be Implemented) would be impracticable due to implications for safety, sustainability, and Title 10 requirements for the reasons more fully described in Appendix K (Geographic Mitigation Assessment) and Chapter 5 (Mitigation). As described in Section 3.7.3.1.2.3 (Impacts from Sonar and Other Transducers Under the Action Alternatives) of the HSTT Final EIS/OEIS, the best available science does not indicate that active sonar activities under the Proposed Action will result in mortality or population-level impacts on marine mammals. The vast majority of Navy takes of marine mammals under the MMPA are Level B harassment takes involving relatively minor and temporary behavioral reactions that do not have

Table H-3: Comment Response Matrix (continued)

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			measurable long-term or permanent impacts to stocks or species.
111	State: S05-04	Cascadia Research Collective's work in Hawaii has identified ten (10) resident populations/species off Hawaii Island versus only four (4) off Kauai and Niihau, as well as the high-density area for the ESA listed false killer whales. Such a large number of resident populations of odontocetes around an island area is not known anywhere else in the world. In the DEIS, a variety of geographic mitigation areas (planning and cautionary area) have been proposed, and while some of these restrictions will be beneficial to the populations (e.g., excluding explosive use in the west side cautionary area), overall these exclusions will likely be ineffective for providing protection to these populations, for several reasons. Details on the geographic mitigation are presented in Appendix K of the DEIS particularly pages K-20 to K26 (HSTT DEIS: Appendix K: Geographic Mitigation Assessment October 2017). The "restrictions" to sonar use in these areas are not as restrictive as biologists would recommend, i.e., as presented, a certain amount of sonar will still be used in these planning areas, exposing populations to unnecessary levels of risk. The planning awareness areas do not prohibit the use of hull-mounted sonar, they only limit the number of major training exercises that may use them (i.e., these areas continue to allow sonar use during unit level training, maintenance and system checks while in transit). The number of major training exercises allowed (4) is actually likely higher than existing number of exercises in the area (even prior to the 2015 settlement) thus these restrictions do not actually result in a reduction in sonar exposure.	Overall, the mitigation that will be implemented for Phase III represents an increase over what was developed for Phase II and, in some cases, the measures set forth in the 2015 HSTT-related settlement agreement. The Navy considered numerous data inputs when developing mitigation areas, including but not limited to operational data on the projected future locations and numbers of major training exercises throughout the Study Area. Therefore, the mitigation provides an avoidance or reduction of potential impacts relative to the level of impact that would occur if the mitigation areas were not developed (i.e., the mitigation benefit is comparative to the potential impacts of the Proposed Action, not to the potential impacts of past actions). The Navy specifically developed its mitigation areas based in part on known high-use areas of false killer whales and beaked whales in the Hawaii Range Complex. The newly developed mitigation areas will reduce the number and level of impacts on marine mammal species and stocks, including false killer whales, humpback whales, Cuvier's beaked whales, Blainville's beaked whales, pygmy killer whales, dwarf sperm whales, melon-headed whales (including the Kohala resident stock), short-finned pilot whales, and dolphin species occurring within the area without compromising military readiness. Implementing mitigation within mitigation areas beyond what is described in Section 5.4 (Mitigation Areas to be Implemented) would be impracticable due to implications for safety, sustainability, and Title 10 requirements for the reasons more fully described in Appendix K (Geographic

Table H-3: Comment Response Matrix (continued)

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			Mitigation Assessment). Furthermore, the Navy will continue to implement procedural mitigation throughout the Study Area wherever and whenever applicable activities occur, such as active sonar used during major training exercises. As described in the discussion for all odontocetes, even a few minor to moderate TTS or behavioral reactions to an individual over the course of a year are unlikely to have any significant costs or long-term consequences for that individual. Significant impacts on marine mammal natural behaviors or abandonment due to training with sonar and other transducers are unlikely to occur within the Study Area.
112	State: S05-05	Importantly, the areas do not include any restrictions for helicopter dipping sonar, and a recent paper shows that this type of sonar can result in similar or greater behavioral changes for beaked whales (Falcone et al., Diving behavior of Cuvier's beaked whales exposed to two types of military sonar, 2017).	Regarding Falcone et al. (2017), the Navy relied upon the best science that was available to develop the behavioral response functions in consultation with NMFS. The Navy's current beaked whale behavioral response function (BRF) acknowledges and incorporates the increased sensitivity observed in beaked whales during both behavioral response studies and during actual Navy training events. This article was not available at the time the behavioral response functions were developed. The new information and data presented in the new article was recently reviewed by the Navy and will be quantitatively incorporated into the Navy's future behavioral response functions as appropriate. However, the Navy's current beaked whale BRF covers the responses observed in the new article since the beaked whale risk function is more sensitive than the other risk functions at lower received levels. Thus far, no new information has been published or otherwise conveyed that would fundamentally change the assessment of impacts or conclusions of this EIS/OEIS. Watwood et al. (2017) found that the durations of

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
			helicopter dipping events were generally short (< two hours), while hull-mounted sonar events, or events with both types of sonar present, lasted much longer. The number of group vocal periods were similarly reduced during the periods of helicopter-dipping and hull-mounted sonar activity, and then returned to pre-sonar levels in the periods just after the events, although there was significantly less of a decline in group vocal periods for helicopter-dipping sonar than there was for hull-mounted sonar. In addition, during periods of hull-mounted sonar the beaked whales not only decreased their dives but moved to the edges of the range, as observed at Pacific Missile Range Facility (PMRF) by Manzano-Roth et al. (2017). In contrast, although there were fewer group vocal periods during helicopter-dipping sonar than before or after, the dives that did occur remained in the same general area on the range. This may be why there were more changes to beaked whale dive behavior for helicopter-dipping sonar than for hull-mounted sonar found in Falcone et al. (2017); since the locations of helicopter-dipping sonar events are random across the range and of short duration, beaked whales respond by increasing the durations of their dives rather than moving off the range to avoid the area. Due to lower power settings for dipping sonar, potential impact ranges of dipping sonar are significantly lower than surface ship sonars. For example, the HSTT average modeled range to temporary threshold shift of dipping sonar for a 1-second ping on low-frequency cetacean (i.e., blue whale) is 77 m, and for mid-frequency cetaceans including beaked whales is 22 m (HSTT Draft EIS/OEIS Table 3.7-7). Limited ping time and lower power settings therefore would limit the impact

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
			from dipping sonar to any marine mammal species. There are mitigation measures for helicopter-deployed mid-frequency active sonar as described in Section 5.3.2.1 (Active Sonar). The Navy will implement procedural mitigation for mid-frequency active sonar activities whenever and wherever these activities occur in the Study Area (including activities involving the use of rotary-wing aircraft). Implementing procedural mitigation beyond what is described in Section 5.3 (Procedural Mitigation), such as increasing the mitigation zones for mid-frequency active sonar to encompass the predicted ranges to behavioral impacts, would be impracticable due to implications for safety, sustainability, and Title 10 requirements for the reasons more fully described in Chapter 5 (Mitigation). As described in Appendix K (Geographic Mitigation Assessment), new proposed mitigation measures include limiting the annual use of helicopter dipping sonar in the Hawaii Island Mitigation Area.
113	State: S05-13	In conclusion, the Division recommends that the Department of the Navy reevaluate potential areas to conduct certain kinds of training in order to attain lower behavioral, TTS and PTS takes. DAR recommends that the Navy integrate consideration of the vulnerable state of some cetacean populations as discussed above (in reference to the Main Hawaiian Islands (MHI) Insular Stock False Killer Whales (FKW), Kohala Resident Melon Headed Whales, cetaceans with deeper depth profiles that are more vulnerable to PTS takes) and potentially other species, while planning certain training or testing and work to reduce further, or eliminate entirely, the overlap of sonar or other transducer testing or training in the biologically important areas for cetaceans identified in Biologically Important Areas for	The Navy has done what the Division recommends, which is to conduct an evaluation of all potential mitigation areas throughout the Study Area in order to avoid or reduce potential impacts to marine mammals from the Proposed Action to the maximum extent practicable. The analysis included an assessment of the biologically important areas identified by Baird et al. (2015), which is included in Appendix K (Geographic Mitigation Assessment). The Navy developed several mitigation areas specifically to avoid or reduce impacts to the species that inhabit these areas, including but not limited to known high-use areas of false killer whales and the small and resident population of the Kohala resident stock of melon-headed whales. The Navy determined

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
		Cetaceans Within U.S. Waters – Hawai'I Region (Baird et al., Aquatic Mammals, 2015). DAR recommends that the Department of the Navy consult with local cetacean researchers (that conduct Hawaiian cetacean studies currently) to receive constructive input and feedback on potential ways to minimize or reduce the proposed takes on any other cetaceans of concern. The division was not able to research the full potential impact to each species at this time, with an abbreviated review period, and the following researchers may have the most current and contemporary information related to the status and health of each species. These researcher include but are not limited to: Robin Baird (Cascadia Research Collective), Ed Lyman (Hawaiian Island Humpback Whale National Marine Sanctuary), Adam Pack (University of Hawaii at Hilo), Rachel Cartwright (Keiki Kohola Project), Jim Darling (Whale Trust), Joseph Mobley (University of Hawaii), Whitlow Au (University of Hawaii-HIMB), Ann Zoidis (Cetos Research Organization), Christine Gabriele (Hawaii Marine Mammal Consortium), Jason Turner (University of Hawaii- Hilo), Greg Kauffman (Pacific Whale Foundation), and Bruce Mate (Oregon State University-Marine Mammal Institute). Thank you for providing us the opportunity to review and comment on the Notice of Availability of the Hawaii-Southern California Training and Testing Draft Environmental Impact Statement. Should there be any changes, amendments or modifications to the current plans, DAR requests the opportunity to review and comment on those changes. DAR also requests the opportunity to review and comment on the Hawaii-Southern California Training and Testing Final Environmental Impact Statement (FEIS).	that implementing mitigation beyond what is described in Section 5.3 (Procedural Mitigation to be Implemented) and Section 5.4 (Mitigation Areas to be Implemented) would be impracticable due to implications for safety, sustainability, and Title 10 requirements for the reasons described in Appendix K (Geographic Mitigation Assessment) and Chapter 5 (Mitigation). Through its marine species monitoring program, the Navy continuously collaborates with researchers in Hawaii and funds research on marine mammals in Hawaiian waters. The Navy uses the best available science, including data collected from researchers in Hawaii, to inform its environmental assessments and mitigation development. The Navy funds much of the ongoing noise impact analysis work currently being conducted, and works in collaboration with many researchers, including those in Hawaii, in order to obtain the best noise impact data to use in its EISs. For additional information on the U.S. Navy Marine Species Monitoring Program and access to technical reports and publications from Navy-funded projects in Hawaii, visit https://www.navymarinespeciesmonitoring.us/.

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
Consultation concerns under ESA, MMPA, CZMA, MBTA, NHPA, etc.			
114	State: S01-01 S08-01 Individuals: ANONY1	It would appear from the DEIS that the Navy intends to submit a consistency determination to the California Coastal ("Commission") for this activity, based on the Navy's past practice of having submitted consistency determinations for the last three iterations of the California portions of HSTT activities (Consistency Determinations CD-086-06, CD-049-08, and most recently, CD-008-13). We use the term "appear" because, while the DEIS indicates in Chapter 6 the Navy will comply to the maximum extent practicable with California Coastal Management Program ("CCMP"), the DEIS does not overtly state in Chapter 6 that a consistency determination will be submitted to the Commission. Moreover, it is not clear to us why the listing of applicable federal laws in Chapter 1 of the DEIS does not mention the Coastal Zone Management Act ("CZMA") as among the applicable federal statutes. We are therefore requesting that the Navy eliminate any ambiguities and specify the mechanism by which it intends to comply with the CZMA. The proposed actions listed in the HSTT EIS/OEIS will affect uses and resources of Hawaii's CZM area. Therefore, a Coastal Zone Management Act consistency determination must be submitted to the Hawaii CZM Program for review.	The Navy revised Chapter 1 (Purpose and Need) to include CZMA as part of the applicable federal statutes and has clarified in Chapter 6 (Regulatory Considerations) that a Consistency Determination was submitted in March 2018.
115	Native American Tribes: N01	The project area may contain many sacred sites to the Kumeyaay people: We request that these sacred sites be avoided with adequate buffer zones. Additionally, Viejas is requesting, as appropriate. the following • All NEPA/CEQA/NAGPRA laws be followed • Immediately contact Viejas on any changes or inadvertent discoveries.	All of the activities proposed in the HSTT EIS/OEIS would occur at sea, most of which occur greater than 12 nautical miles from the coast of Southern California, and well distant from any Kumeyaay historic sites. The Navy complies with all NEPA and NAGPRA laws.
116	Organization: S01-02	Such differences have involved questions of which marine species were to be considered "coastal zone resources," the	A Consistency Determination was submitted to the California Coastal Commission in March 2018. In that

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
		litigation that has ensued over these differences, which activities were considered to involve effects on coastal zone resources, what thresholds should be relied upon in the determination of effects to marine mammals, and, most importantly, what minimization and mitigation measures should be employed to reduce such impacts.	Consistency Determination, the Navy describes all its proposed activities and evaluates impacts to all coastal resources, whether those impacts could occur outside or within the coastal zone. The Navy's proposed mitigation measures are described in Appendix C (Mitigation) of the Consistency Determination and Chapter 5 (Mitigation) in the EIS/OEIS.
117	Individuals: LILTE-03	The US Endangered Species Act is very clear. If anyone wishes to have an action in the habitat of endangered species that has the likelihood of altering the habitat of those endangered species, then they must do a federal environmental study before that action takes place! That study is called a "Habitat Conservation Plan." The Navy needs to do this plan and get an "Incidental Take Permit" from NOAA and the US Fish and Wildlife Service to kill sea turtles, monk seals and their coral reef habitat before they do ANY of their war testing operations here in Kauai.	The Navy is consulting with NOAA under the Marine Mammal Protection Act (MMPA) and Endangered Species Act (ESA) for marine mammals including monk seals, and USFWS for sea turtles and seabirds. The Navy is not requesting authorization to kill sea turtles, monk seals, or coral in Hawaii. Those consultations will result in a Final Rule and a Letter of Authorization under MMPA and a Biological Opinion (containing an Incidental Take Permit) or Letter of Concurrence under ESA. The EIS/OEIS is the appropriate environmental study and is what's required for Federal Agencies under the National Environmental Policy Act. Habitat Conservation Plans apply only to private entities.
118	State: S02-03	3. If the Applicant's project involves work in, over, or under waters of the United States, it is highly recommended that they contact the Army Corp of Engineers, Regulatory Branch (Tel: 835-4303) regarding their permitting requirements.	The Navy's proposed activities addressed in the HSTT EIS/OEIS do not require permitting with the Army Corp of Engineers.
119	State: S04	1) If any actions related to this project impact lands or the shoreline of Maui County, to include the islands of Maui, Molokai, and Lanai, please contact me for further guidance regarding any potential required permits for your actions; and 2) Please keep me informed by sharing any relevant actions or documents as this EIS process moves forward.	The Navy's proposed activities addressed in the HSTT EIS/OEIS would not impact lands or the shoreline of Maui County. The Navy continued to provide updates to the Maui Department of Planning throughout the EIS/OEIS process.

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
Concerns about alternatives/expansion of alternatives			
120	Organization: O02-04	4 comments were submitted asserting that the Navy did not consider a full range of alternatives, and/or that the alternatives were not adequate for the NEPA process.	As required by the CEQ regulations, the Navy included the No Action Alternative. In Appendix K (Geographic Mitigation Assessment), the Navy analyzed time and area restrictions to ensure decision makers take into account all possible approaches which would mitigate environmental impacts. Pursuant to 40 CFR 1502.14(f) appropriate mitigation measures can be considered outside the context of reasonable alternatives. The Navy used scientific data on vulnerable or sensitive species such as beaked whales and main Hawaiian Islands insular false killer whales to derive the geographic mitigation areas in the EIS/OEIS. As the Navy intends to apply selected mitigation measures to either alternative, the EIS/OEIS adequately discusses mitigation and does consider all possible measures to minimize environmental impacts. The Navy's alternatives were developed in order to satisfy the Navy's purpose and need related to fulfilling its Title 10 requirements. Consistent with 40 C.F.R. 1502.14, the Navy has included a robust suite of mitigation measures, which will be implemented in both action alternatives (i.e., regardless of which alternative is selected). These mitigation measures, as well as standard operating procedures that Navy routinely employs, are discussed in detail and specifically inform the decision maker and the public how the Navy can avoid or minimize adverse impacts. NEPA identifies the application of mitigation measures, such as those suggested by the comment, to the alternatives "when not already included in the proposed action or alternative" (40 C.F.R. 1502.14). Details regarding the

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
			development of reasonable alternatives are provided in Section 2.4, (Action Alternative Development). The Alternatives carried forward meet the Navy's purpose and need (see Section 1.4, Purpose of and Need for Proposed Military Readiness Training and Testing Activities) to ensure that it can fulfill its obligation under Title 10. See Section 2.4 (Action Alternative Development) for more detailed information on the development of alternatives. The Navy complied with NEPA requirements in the development and consideration of alternatives. This EIS/OEIS analyzes all alternatives in Section 2.5 (Alternatives Carried Forward) and explains why the Navy has eliminated other alternatives in Section 2.4.3 (Alternatives Eliminated from Further Consideration). The selection of an alternative by the decision-maker will be based on a review of all relevant facts, impact analyses, and comments received via the EIS/OEIS public participation process.
121	Organization: O06-03	3. The National Environmental Policy Act (NEPA) requires that the DoN evaluate a range of "reasonable alternatives which would avoid or minimize adverse impact". The DEIS/OEIS fails to do that. The DoN needs to analyze alternatives that would be more protective of marine mammals, including--but not limited to--alternatives involving all of the restrictions from the 2015 settlement as well as additional alternatives that consider protecting biologically important areas that were not addressed in the 2015 settlement. For example, the DoN should examine alternatives involving protecting areas around Oʻahu and Kauaʻi, which the National Marine Fisheries Service (NMFS) recently proposed as critical habitat for endangered Insular False Killer Whales.	The Alternatives carried forward meet the Navy's purpose and need (see Section 1.4, Purpose and Need for Proposed Military Readiness Training and Testing Activities) to ensure that it can fulfill its obligation under Title 10. See Section 2.4 (Action Alternative Development) for more detailed information on the development of alternatives. The Navy complied with NEPA requirements in the development and consideration of alternatives. This EIS/OEIS analyzes all alternatives in Section 2.5 (Alternatives Carried Forward) and explains why the Navy has eliminated other alternatives in Section 2.4.3 (Alternatives Eliminated from Further Consideration). All Navy alternatives carried forward contain both procedural and geographic

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
		4. The DEIS/OEIS makes qualitative statements that restricting training and testing in various biologically important areas would not confer much benefit on marine mammals and then refuses to consider alternatives imposing limitations in those areas. The DEIS/OEIS needs to analyze such alternatives and provide rigorous, quantitative analysis of the benefits that restrictions in various areas would confer. Without such an analysis, there is no opportunity for meaningful public comment--including expert comment--on the DoN's analysis and, further, the public has no way of knowing if the DoN has taken a serious look at ways to minimize impacts.	mitigation measures. The selection of an alternative by the decision-maker will be based on a review of all relevant facts, impact analyses, and comments received via the EIS/OEIS public participation process. To consider the benefits of procedural mitigation to marine mammals and sea turtles within the MMPA and ESA impact estimates, the Navy conservatively factored mitigation effectiveness into its quantitative analysis process, as described in the technical report titled Quantifying Acoustic Impacts on Marine Mammals and Sea Turtles: Methods and Analytical Approach for Phase III Training and Testing. The benefits of mitigation areas are discussed qualitatively and have not been factored into the quantitative analysis process or reductions in take for MMPA and ESA impact estimates. Marine mammal mitigation areas are designed to help avoid or reduce potential impacts during biologically important life processes within particularly important habitat areas. Therefore, the mitigation benefit is discussed in terms of the context of impact avoidance or reduction.
122	Organization: O04-03	We urge the Navy to provide more information on its preferred alternative, which otherwise, based on the information presented in the DEIS, appears to have been designed on the basis of factors unrelated to avoiding or minimizing adverse impacts. To satisfy NEPA, the Navy should develop a fuller range of reasonable alternatives, such as by considering enhancements to its proposed time-area management measures.	The Navy's alternatives were developed in order to satisfy the Navy's purpose and need related to fulfilling its Title 10 requirements. The Navy has explored and evaluated all reasonable alternatives. Details regarding the development of reasonable alternatives are provided in Section 2.4 (Action Alternative Development) and Section 2.5 (Alternatives Carried Forward). Consistent with 40 C.F.R. 1502.14, the Navy has included a robust suite of mitigation measures, which will be implemented in both action alternatives (i.e., whichever alternative is selected). These mitigation measures, as well as standard operating procedures that the Navy routinely employs, are discussed in detail and specifically inform

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
			the decision maker and the public how the Navy can avoid or minimize adverse impacts. NEPA identifies the application of mitigation measures, such as those suggested by the comment, to the alternatives "when not already included in the proposed action or alternative" (40 C.F.R. 1502.14).
123	Organization: O05-07 Individuals: MONNI-10	The EIS fails to discuss alternatives to active sonar or other ways to detect submarines	The alternatives carried forward meet the Navy's purpose and need (Section 1.4, Purpose and Need for Proposed Military Readiness Training and Testing Activities) to ensure that it can fulfill its obligation under Title 10. The Navy complied with NEPA requirements in the development and consideration of alternatives. See Section 2.4 (Action Alternative Development), Section 2.5 (Alternatives Carried Forward) and Section 2.4.3 (Alternatives Eliminated from Further Consideration). The selection of an alternative by the decision-maker will be based on a review of all relevant facts, impact analyses, and comments received via the EIS/OEIS public participation process.
124	Organization: O02-02	The DEIS fails, however, to provide any meaningful analysis of the benefits to the environment associated with cessation of the Navy's HSTT activities [under the "No Action" Alternative]. Instead, for nearly every category of potential environmental impact, the DEIS merely asserts in a cursory, conclusory manner that "baseline conditions of the existing environment would either remain unchanged or would improve slightly after cessation of ongoing training and testing activities."	As required by the CEQ regulations, the Navy included the No Action Alternative. The Draft EIS/OEIS analyzed the impacts associated with Alternative 1 and Alternative 2 resulting from the Navy's actions. In many cases, impacts are anticipated to range from minimal to undetectable. Given that the impacts are anticipated to be minimal to undetectable, conclusions regarding the impacts of the No Action Alternative would logically remain unchanged or improve slightly.

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
125	Organization: O02-07	The proposed seasonal limitation on in-water explosives in the San Diego Arc Cautionary Area is an improvement that should be incorporated into the alternatives analyzed.	The EIS/OEIS has incorporated seasonal limitations on in-water explosives in the San Diego Arc Mitigation Area. This mitigation measure is in both Alternative 1 and Alternative 2.
126	Individual: STRSx-02	(2) We wish for the Navy to minimize its testing/firing, and move much further out to sea, away from island reefs and channels, whale migration pathways that ammo and sonar and drone testing be moved hundreds of miles out to sea and halted if any sea life activity is actively present. Please halt all overzealous activity and immediately reverse all destructive environmental decremation. *Advocate for Pease and Environmental Health.	As stated in Section 2.4.3.1 (Alternative Training and Testing Locations), Navy ranges allow for the entire spectrum of training and testing to occur in a given range complex. The Study Area has attributes necessary to support effective training and testing, some of which require activities to occur near shore. For example, activities benefit from being near shore-based facilities and infrastructure, because of the logistical support provided for training and testing activities. Also, the presence of unique ranges, which include instrumented deep and shallow ranges offer training and testing capabilities not available elsewhere in the Pacific. Finally, environmental conditions (e.g., bathymetry, topography, and weather) found in the Study Area maximize the training realism and testing effectiveness.
Commercial/Socioeconomic concerns			
127	Individuals: HOLWI-03	(3) Species of migratory fishes supports sustainability and puts food on the table.	As stated in the Draft EIS/OEIS in Section 3.11 (Socioeconomics), Navy activities would not impact the availability of target species for commercial, recreational, or subsistence fishing.
128	Federal: F01-01	Navy Should Consider Impacts of the Proposed Action on Future Energy Production Currently, the Navy has determined that offshore wind is incompatible with current training activities offshore of both Hawai‘i and California. In light of the developments noted in Hawai‘i and California in areas that overlap with the Study Area, the Navy should consider how its Proposed Action affects future energy production. If the Proposed Action involves continued limitation and incompatibility between the Navy mission and	Since the Proposed Action does not involve constructing new infrastructure or creating additional restrictions to shared uses of the Study Area, further assessment of impacts to specific energy development potential was not needed.

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
		offshore wind energy production, then the Proposed Action will have impacts on future energy production offshore of both Hawaii and California. Therefore, DOI requests that the Navy consider these potential impacts on long-term energy production beyond 2018.	
129	Federal: F01-02	DOI has comments on section ES.6.2.11, long-term impacts to socioeconomic resources. Specifically, section ES.6.2.11 states the following: "ES.6.2.11 Socioeconomics The analysis indicates that the Proposed Action is not expected to result in long-term impacts to socioeconomic resources in the Study Area, including energy production and distribution, mineral extraction, commercial transportation and shipping, commercial and recreational fishing, aquaculture, and tourism. […] No impacts on sources for energy production and distribution, mineral extraction, and aquaculture are anticipated. Short-term impacts, should they occur, would not contribute incrementally to cumulative socioeconomic impacts." [emphasis added] The Proposed Action is defined in the EIS/OEIS, section ES.4 Proposed Action and Alternatives as: "The U.S. Navy proposes to conduct military readiness training activities and research, development, testing, and evaluation (hereinafter referred to as "testing") activities in the HSTT Study Area, as represented in Figure ES-1. These military readiness activities include the use of active sonar and explosives at sea off the coasts of Hawaii and Southern California, on the high seas where training and sonar testing and maintenance may occur during vessel transit between these areas, in the Temporary Operating Area north and west of the Hawaii Operating Area, and at select Navy pierside and harbor locations. These military readiness activities are generally consistent with those analyzed in the HSTT EIS/OEIS completed	The Navy reviews proposals for offshore energy production as they are presented. In each case, the Navy provides inputs as to how those activities would affect the Navy's plans for continuing training and testing activities in the HSTT Study Area. However, should any offshore development occur, the Navy would then consider them in its future planning. Such offshore facilities would be avoided by the Navy as it does existing offshore facilities, in such a manner as to avoid any impact to the offshore facilities. Therefore, the Navy's activities would not impact any of the offshore proposals mentioned in the comment.

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
		in December 2013 and are representative of training and testing that the Navy has been conducting in the HSTT Study Area for decades." [emphasis added] However, DOI notes developments since the 2013 EIS/OEIS. While DOI appreciates that the Proposed Action is generally consistent with prior year analyses, the human resources and socioeconomic landscape in close proximity to the Study Area is different now than it was in December 2013. Developments in offshore wind energy planning in both Hawaii and California, in close coordination with BOEM, indicate that the Navy should consider and identify impacts associated with its Proposed Action on this changed landscape. In 2015, the State of Hawaii passed legislation requiring significant increases in renewable energy electricity generation. In 2016, Hawaiian Electric Company (HECO), the only utility on the island of Oahu, identified offshore wind in its long-term energy planning, the 2016 Power Supply Improvement Plan (PSIP). In 2017, the Hawaii Public Utilities Commission (PUC) accepted the PSIP. It is important for the Navy to evaluate (1) this new direction in energy production planning by the State and local utility offshore of Oahu since the Navy last conducted its 2013 EIS/OEIS HSTT analyses, and (2) to identify impacts of its Proposed Action on future energy production in the Study Area. The California Clean Energy and Pollution Reduction Act of 2015 (Senate Bill [SB] 350, Chapter 547, Statutes of 2015) and SB 32 (Chapter 249, Statutes of 2016) establish State policies to reduce Greenhouse Gas (GHG) emissions to 40 percent below the 1990 statewide GHG levels and request that the California electricity portfolio planning process focus on resource mixes that can reduce GHG emissions. SB 350 establishes a policy of meeting at least 50 percent of California's electricity needs with renewable energy sources by 2030.	

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
		The State of California and the U.S. Department of Interior signed a memorandum of understanding in December 2016 to collaborate and engage in a multi-phase process to collect data to inform planning efforts and identify possible areas offshore California that are suitable for potential offshore renewable energy projects. BOEM, is actively engaging with the State of California in an extensive stakeholder outreach process to identify one or more areas offshore California that will be the subject of a Call for Information and Nominations (Call) regarding wind energy leasing. Since the Navy last conducted its 2013 EIS/OEIS, BOEM received commercial interest to develop renewable energy in BOEM-jurisdictional areas that overlap with the Study Area. Specifically, BOEM received interest from five offshore wind developers (three in Hawaii and two in California) to develop offshore wind energy. Navy Should Consider Impacts of the Proposed Action on Future Energy Production Currently, the Navy has determined that offshore wind is incompatible with current training activities offshore of both Hawai‘i and California. In light of the developments noted in Hawai‘i and California in areas that overlap with the Study Area, the Navy should consider how its Proposed Action affects future energy production. If the Proposed Action involves continued limitation and incompatibility between the Navy mission and offshore wind energy production, then the Proposed Action will have impacts on future energy production offshore of both Hawaii and California. Therefore, DOI requests that the Navy consider these potential impacts on long-term energy production beyond 2018.	
130	Federal: F01-03	Potential impacts to Hawai‘i Volcanoes National Park DOI, through the National Park Service, is concerned with the potential for impacts from aviation activities over the Hawai‘i	The Navy's proposed activities addressed in the HSTT EIS/OEIS do not include aircraft or unmanned aerial

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
		Volcanoes National Park. Noise could potentially travel across park lands and impact park resources and values including visitor experience, cultural resources including cultural landscapes, Congressionally designated wilderness, and threatened and endangered wildlife. The DEIS states it does not address any land-based activities, however at Hawai'i Volcanoes National Park, whenever there is training in the area, Navy aircraft 'sightsee' in the park. We request that you develop guidelines for education of pilots to prohibit this kind of behavior. We appreciate your willingness to enforce the standard military restriction for aircraft over national parks and request that you also consider prohibiting flights over the park. The DEIS discusses unmanned aerial systems. Please be aware that there are specific rules and regulations regarding unmanned aerial systems in national park units and each park unit may have additional policies regarding their use. While the cumulative impact of the proposal over the entire study area may not be significant, increases in flights, particularly at low level altitudes, is a considerable impact to park resources such as wilderness, visitor experience, soundscapes, and threatened and endangered species. When added to potential impacts from other military activities in Hawai'i that impact the park, it could become a significant impact. Section 3.11.3.2.1.1 (Socioeconomics - Airborne Acoustics; Tourism) discusses impacts to tourism from aircraft in transit, yet subsequently discounts any impact by stating that 'most activities occur out at sea'. It does not address those flights that do not fall under the 'most' category. The proposed activities may have negative impacts on tourism, particularly in areas where natural quiet and solitude are an important visitor experience. Hawai'i Volcanoes National Park is the premier	systems flights over or near the Hawaii Volcanoes National Park.

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
		tourism destination for visitors to Hawaii, receiving approximately 1.9 million visitors annually who are here for a once in a lifetime experience. The EIS describes that noise as short term and temporary, but to visitors to a national park, even temporary noises can negatively affect their experience. See below for recommended mitigation measure to prevent this. Mitigation Measures DOI would like the Navy to consider adding two mitigation measures to reduce impacts of the proposed action. First, observe a voluntary standoff over Hawai'i Volcanoes National Park for all aircraft. Second, the National Park Service would appreciate the opportunity to participate in any future pilot briefings and consultations regarding natural and cultural resource issues, particularly for Hawai'i Island. Hawai'i Volcanoes National Park has unique issues related to park resources, as well as the NOTAMs for Kīlauea Volcano.	
Pollutants			
131	State: S06-01 S08-03 Organization: O07-03 O18-02 Individuals: HOLWI-04 MOTPU-02 MONNI-05 SHABE-02	6 comments were submitted with concerns for pollutants and entanglement of military expended materials into the water.	The Navy is concerned with the health of coastal communities, fisheries, and ecosystems. Section 3.2 (Sediments and Water Quality) concludes, based upon the best available science, that chemical, physical, and biological changes to sediment or water quality would be measurable but below applicable standards, regulations, and guidelines, and would be within the existing conditions or designated uses. The Navy's training and testing activities are in compliance with all applicable laws and regulations concerning the impact of military expended materials and associated chemical constituents in the ocean environment. The Navy conducted a thorough analysis of potential impacts from entanglement in the Draft EIS/OEIS. This

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
			analysis can be found in various sections in Chapter 3 (e.g., Sections 3.6.3.5, Entanglement Stressors [Fishes]; 3.7.3.5, Entanglement Stressors [Marine Mammals]; and 3.8.3.5, Entanglement Stressors [Reptiles]). Any unexploded munition settles to the ocean bottom in very deep water, making it extremely impractical to recover. The fate of these military munitions in the marine environment is analyzed in Section 3.2.3.1 (Explosives and Explosives Byproducts) of the Draft EIS/OEIS.
132	State: S08-04 Organization: O03-02 O05-03 Individual: CUCJU-02	There needs to be a more robust discussion on marine debris and related impacts such as increased entanglement and unexploded ordinance removal.	The Navy analyzed potential impacts from military expended materials and entanglement in the EIS/OEIS. This analysis can be found in various sections in Chapter 3 (e.g., Sections 3.6.3.5, Entanglement Stressors [Fishes]; 3.7.3.5, Entanglement Stressors [Marine Mammals]; and 3.8.3.5, Entanglement Stressors [Reptiles]). Also, in Appendix F (Military Expended Material and Direct Strike Impact Analyses), the Navy quantifies the material expended by the Navy and describes the potential disturbance footprint of those items. Any unexploded munition settles to the ocean bottom in very deep water, making it impractical to recover. The fate of these military munitions in the marine environment is analyzed in Section 3.2.3.1 (Explosives and Explosives Byproducts).
133	State: S02-01	1. Any project and its potential impacts to State waters must meet the following criteria: a. Antidegradation policy (HAR, Section 11-54-1.1), which requires that the existing uses and the level of water quality necessary to protect the existing uses of the receiving State water be maintained and protected. b. Designated uses (HAR, Section 11-54-3), as determined by the classification of the receiving State waters.	The Navy is concerned for the health of coastal communities, fisheries, and ecosystems. Section 3.1 (Sediments and Water Quality) concludes, based upon the best available science, that chemical, physical, and biological changes to sediment or water quality would be measurable but below applicable standards, regulations, and guidelines, and would be within the existing conditions or designated uses. The Navy's training and

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
		c. Water quality criteria (HAR, Sections 11-54-4 through 11-54-8).	testing activities are in compliance with all applicable laws and regulations concerning potential impacts on water quality in the ocean environment.
134	State: S02-02	2. The Applicant may be required to obtain National Pollutant Discharge Elimination System (NPDES) permit coverage for discharges of wastewater, including storm water runoff, into State surface waters (HAR, Chapter 11-55). Please note that all discharges related to the project construction or operation activities, whether or not NPDES permit coverage and/or Section 401 WQC are required, must comply with the State's Water Quality Standards. Noncompliance with water quality requirements contained in HAR, Chapter 11-54, and/or permitting requirements, specified in HAR, Chapter 11-55, may be subject to penalties of $25,000 per day per violation.	The Navy's proposed activities addressed in the HSTT EIS/OEIS do not include discharges of wastewater into State surface waters.
Ship Strikes			
135	Organization: O04-57	5) Offsets for undetected and unreported collisions in assessing ship-strike risk This approach, however, fails to account for the likelihood that ship strikes since 2009 were unintentionally underreported.	The Navy does not underreport ship strikes. The Navy found that use of historical data was more appropriate for the analysis. The strike probability analysis completed in this EIS/OEIS is based upon actual data collected from historical use of vessels and represents a more realistic approach to account for military missions and combat variables. NRDC's assertion that Navy ships cannot detect ship strikes is categorically incorrect. In the extremely few instances where Navy ships have struck whales, these ships ranged in size from small to aircraft carrier size. Additionally, Navy ships have multiple lookouts, including on the aft part of the ship that can visually detect a hit whale (which has occurred), in the unlikely event the ship does not feel the strike. The commenter otherwise provides no evidence demonstrating Navy vessels are striking whales and not reporting these strikes.

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
Cumulative Impacts			
136	Organization: O09-04 O07-06	2 comment were submitted requesting cumulative impacts analysis in the EIS/OEIS.	The Navy used the best available science and a comprehensive review of past, present, and reasonably foreseeable actions to develop its Cumulative Impacts analysis found in Chapter 4 (Cumulative Impacts).
137	Organization: O04-59 O04-60 O04-61	Nor does the Navy's treatment of cumulative impacts, adding the impacts of other reasonably foreseeable activities to its own projected training and testing, result in an adequate analysis. The DEIS begins by listing numerous other military, commercial, and industrial activities in the region (DEIS at 4-4 to 4-29), including pier replacements, Air Force training, commercial fishing, and oil and gas development, which the administration's April 2017 Executive Order intends to accelerate and expand. Unfortunately, in assessing the additive and synergistic impacts of its own activities, the Navy provides only abstract rationalization. With respect to acoustic impacts, for example, the Navy asserts that its activities are not a "significant portion of the overall ocean noise budget" (DEIS at 4-49), which not only appears incorrect on its face, but ignores the basic fact that transient activities can degrade acoustic habitat for some species regardless of their contribution to total energy output. It then acknowledges that its activities could compound the adverse effects of other stressors, but states, without support or analysis, that its mitigation measures render its incremental impact insignificant (DEIS at 4-49). Finally, it suggests that NMFS' stock assessment reports, which track Potential Biological Removal, and take authorization and adaptive management processes provide a sufficient safeguard against population-level harm (DEIS at 4-50), yet Potential Biological Removal considers only mortality, not sublethal	The commenters' assertion regarding the analysis is incorrect. The Navy, in cooperation with NMFS, has taken a hard look at the cumulative effects of the incremental impact of its proposed actions when added to other past present and future actions, against the appropriate resources and regulatory baselines. The Navy used the best available science and a comprehensive review of past, present, and reasonably foreseeable actions to develop its Cumulative Impacts analysis. As required under NEPA, the level and scope of the analysis is commensurate with the potential impacts of the action as reflected in the resource-specific EIS, discussions in Chapter 3 (Affected Environment and Environmental consequences). The EIS/OEIS considered its activities alongside other actions in the region when those impacts are cumulatively significant. Past and present actions are also included in the analytical process as part of the affected environment baseline conditions presented in Chapter 3. The Navy has done so in accordance with the Council on Environmental Quality 1997 guidance. Per the guidance, a qualitative approach and best professional judgment are appropriate where precise measurements are not available. Where precise measurements and/or methodologies were available they were used. Guidance from the Council on Environmental Quality states it "is not practical to analyze cumulative effects of an action on the universe; the list of environmental effects must focus on those

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
		effects, and, given the difficulty of tracking population trends in long-lived marine wildlife, NMFS biologists have stated that population surveys would usually fail to detect even catastrophic declines in the vast majority of cetaceans. Hildebrand, J.A. (2006). Impacts of anthropogenic sound, in Reynolds, J.E. III, Perrin, W.F., Reeves, R.R., Montgomery, S., and Ragen, T.J. (eds.), Marine Mammal Research: Conservation beyond Crisis. New, L.F., Moretti, D.J., Hooker, S.K., Costa, D.P. and Simmons, S.E. (2013). Using energetic models to investigate the survival and reproduction of beaked whales (family Ziphiidae). PloS ONE, 8(7), e68725).	that are truly meaningful." Further, the U.S. EPA has reviewed the Draft EIS/OEIS and rated the document as LO - lack of objections - which means it has not identified any environmental impact requiring substantive changes to the proposal. Information on the Navy's analysis is provided in Section 4.1.1. (Determination of Significance). Lastly, all of the potential effects on marine mammals from Navy training and testing were analyzed in Section 3.7 (Affected Environment and Environmental Consequences - Marine mammals). Based on the best available science, it was determined that population-level impacts would not occur. The commenter otherwise has provided no evidence that demonstrates stock or population-level consequences resulting from Navy training and testing activities have occurred, activities that have occurred in these areas at similar levels of intensity, for more than 70 years. The commenters' characterization of the Hildebrand 2006 citation is incorrect. In this paper, the author clearly states that the comparison of potential sound energy does not consider other important factors such as the distribution of the sound sources in space and time. Therefore, the findings in the paper do not represent how Navy activities are conducted, or represent how sound from those activities realistically interacts in the natural environment. As clearly stated throughout the AFTT Final EIS/OEIS, the Navy's activities are typically of short duration (minutes to hours) and widely dispersed throughout the study are in space and time. The commenters' characterization of the New et al 2013 paper is also incorrect. New presents a modeling approach that considers many factors, sound being one, to establish a process that could be used to investigate

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
			potential effects to beaked whales when data for the biological factors required by the model becomes available. New 2013 is thoroughly discussed throughout Section 3.7.3 (Environmental Consequences). Lastly, the authors note the need for more data on prey species and reproductive parameters including gestation and lactation duration, as the model results are particularly affected by these assumptions. Through the consultation and permitting processes with NMFS, which also considered the Stock Assessment Reports and ensure any potential effect does not exceed PBR, it was determined that the Navy's Proposed Action would not have measurable, long-term effects on marine mammals. PBR is one tool NMFS uses to ensure population-level harm does not occur. The Navy's monitoring program has also demonstrated no evidence of population-level harm to marine mammals in the HSTT Study Area.
138	Organization: O04-58	B. Cumulative Impacts As with past analyses, the present DEIS tabulates exposures and takes of marine mammal species but has not adequately assessed the aggregate impacts. On the contrary, it assumes, without explanation, that the accumulated annual mortalities, injuries, energetic costs, temporary losses of hearing, chronic stress, and other impacts would not affect vital rates in individuals or populations, even though the Navy's activities would affect the same populations over time. This assumption seems predicated, for many species, on the unsupported notion that transient activity will not accumulate into population-level harm.	Intense monitoring on Navy ranges, areas that have been used for training and testing for decades, has demonstrated no evidence of population-level impacts. Based on best available research from NMFS and Navy-funded marine mammal studies, there is no evidence that "population-level harm" to marine mammals, including beaked whales, is occurring in the HSTT Study Area. Through the LOA process the Navy works with NMFS to assure that the aggregate or cumulative impacts do not have negative population consequences. The marine mammal analysis in Section 3.7 (Marine Mammals), based on best available science, thoroughly discusses potential effects to marine mammals and provides the supporting science behind Navy's conclusions. The presence of numerous small, resident

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
			cetacean individuals, documented high abundances, and populations trending to increase for many marine mammals species in the area does not indicate there are any population-level consequences resulting from decades of ongoing Navy training and testing activities.
139	Organization: O07-13	Cumulative Impacts When addressing the issue of cumulative impacts, this Draft EIS/OEIS has, not surprisingly, taken a similar approach to other Navy sonar EISs in the past. While this Draft EIS/OEIS does list a number of other actions, both federal and non-federal that will or already are affecting the environment, it utterly fails to properly assess how the effects of these other actions, when combined with the effects of the proposed action, will impact the environment. Given the fact that some of the animals that will be impacted by HSTT activities are individuals from endangered and critically endangered species and stocks, some of whose numbers are extremely low, it is very difficult to understand how the Navy can possibly conclude that "the incremental stressors anticipated from the Proposed Action are not anticipated to be significant". If even one of those animals from an endangered species or stock is impacted in such a way as to make it unable to successfully reproduce or care for its young, or if that animal dies as a direct or indirect result of those activities, that will have a very significant impact on the remaining population. It may well directly contribute to the eventual extinction of that species or stock. The Draft EIS/OEIS assertion that "incremental stressors anticipated from the Proposed Action are not anticipated to be significant'' is unscientific and unjustified.	In accordance with Council on Environmental Quality guidance, the cumulative impacts analysis focused on impacts that are "truly meaningful." This was accomplished by reviewing the direct and indirect impacts that would occur on each resource under each of the alternatives. Key factors considered were the current status and sensitivity of the resource and the intensity, duration, and spatial extent of the impacts of each potential stressor. In general, long-term rather than short-term impacts and widespread rather than localized impacts were considered more likely to contribute to cumulative impacts. Those impacts to a resource that were considered to be negligible were not considered further in the analysis. The level of analysis for each resource was commensurate with the intensity of the impacts identified in Chapter 3 (Affected Environment and Environmental Consequences).
Improving communication with public			
140	Organization: O07-07	National Environmental Policy Act (NEPA) NEPA mandates that the Navy take a "hard look" at the environmental consequences of its proposed actions, through	The Navy complies with all applicable environmental laws, including its requirements under NEPA when developing this EIS/OEIS.

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
		an unbiased and rigorous investigation. While the Navy, in this Draft EIS/OEIS, may have improved on its past efforts in regard to somewhat more accurately assessing some impacts to the environment that will occur as a result of its activities, it still falls far short of engaging in an unbiased and rigorous investigation. COAST also believes that the Navy has not met its NEPA obligations in another important way. One of the core principles of NEPA is that of public participation. This helps promote the fundamental principle of our democracy by allowing citizens a voice in the decision making process of federal agencies. This aspect of NEPA reflects the belief that citizens have a right to know, and be heard, when their government proposes actions that will affect them. Scoping meetings, public hearings and comments are the means through which the public participates in the NEPA process. But, if the public's ideas, comments, and concerns fall on deaf ears, if the federal agency will not seriously consider what the public has to offer, then the public's involvement ceases to have any real meaning, and the NEPA process becomes hollow, and is nothing but a sham. For years now, concerned citizens, members of the scientific community, and organizations have been submitting comments on sonar related EISs. What has emerged is a very noticeable and distinct pattern in which the Navy avoids directly addressing some comments, or dismisses or outright ignores others. In some cases when the Navy does respond to a comment, it mischaracterizes the comment, often omitting important elements, the result being again avoidance of actually addressing the comment. This pattern holds true not only in regards to COAST's comments, but also for numerous other comments from members of the public, including some very knowledgeable on the issues involved. Many of the comments which have been avoided, dismissed, or ignored by	NEPA requires federal agencies to provide opportunities for meaningful public involvement. Comments received during the scoping period were considered in the development of the Draft EIS/OEIS. Comments received on the Draft EIS/OEIS have been considered in the development of this Final EIS/OEIS.

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
		the Navy are specific and raise valid questions and concerns about particular content in the EIS. NEPA requires that the Navy address the public's concerns, and not just cast them aside. In doing this, the Navy blocks the ability of the public to have meaningful input into governmental actions that will impact them, thereby obstructing the NEPA process, and therefore, our democratic process as well. Essentially, the NEPA process, as undertaken by the Navy in this and other sonar-related EISs, while outwardly going through the motions. Is hollow. It is a sham.	
Density Estimates			
141	Federal: F02-02	Therefore, the Commission recommends that the Navy specify whether and how it incorporated uncertainty in the pinniped density estimates into its animat modeling and if it did not, use measures of uncertainty inherent in the abundance data (i.e., CV, SD, SE) similar to the methods used for cetaceans.	As noted in the cited technical report *Quantifying Acoustic Impacts on Marine Mammals and Sea Turtles: Methods and Analytical Approach for Phase III Training and Testing* (U.S. Department of the Navy, 2017a), statistical uncertainty was not applied outside the survey boundaries into non-surveyed areas, since that would not be meaningful. The Navy also notes there are no measures of uncertainty (i.e., no CV, SD, or SE) provided in NMFS Pacific Stock Assessment Report (SAR) Appendix 3 (Carretta et al., 2017) associated with the abundance data for any of the pinniped species present in Southern California or for monk seals in Hawaii. Although some measures of uncertainty are presented in some citations within the SAR and in other relevant publications for some survey findings, it is not appropriate for the Navy to attempt to derive summations of total uncertainty for an abundance when the authors of the cited studies and the SAR have not. For additional information regarding use of pinniped density data, see the cited Navy's Marine Species Density Database technical report Section 11 (U.S. Department of the Navy, 2017b). As a result of the lack of published applicable measures of uncertainty for

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
			pinnipeds, the Navy did not incorporate measures of uncertainty into the pinniped density estimates.
142	Federal: F02-03	Therefore, the Commission recommends that the Navy amend its pinniped density estimates by— (1) using the extent of the coastal range (e.g., from shore to 80 km offshore) of harbor seals as the applicable area, 23.3 percent of the California abundance estimate based on Lowry et al. (2008), and an at-sea correction factor of 65 percent based on Harvey and Goley (2011) for both seasons;	The Navy has and will continue to consult with subject matter experts in academia, the NMFS Science Centers, and the National Marine Mammal Laboratory in the development of density estimates. Based on the results from satellite tracking of harbor seals at Monterey, California and the documented dive depths (Eguchi & Harvey, 2005), the extent of the range for harbor seals in the HSTT Study Area used by the Navy (a 50 nautical mile buffer around all known haul-out sites; approximately 93 km) is more appropriate than the suggested 80 km offshore suggested by MMC. The comment is incorrect in its claim that the Navy did not use the best available science. Regarding the appropriate percentage of the CCE abundance to assign to the Navy' Study Area, the 22% Navy used is based on the most recent of the two years provided in Lowry et al. (2008) rather than the mean of two years. Additionally, since approximately 74% of the harbor seal population in the Channel Islands (Lowry et al., 2017) is present outside and to the north of the HSTT Study Area, it is a reasonable assumption that the 22% used already provides a conservative overestimate and that it would not be appropriate to apply a higher percentage of the overall population for distribution into the Navy's modeling areas. Again the comment is incorrect in its claim that the correction factors applied to population estimates were either unsubstantiated or incorrect. Regarding MMC recommended use of an at-sea correction factor of 65 percent for both seasons based on Harvey and Goley (2011), that correction factor was specifically meant to

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
			apply to the single molting season when harbor seals are traditionally surveyed (see discussion in Lowry et al. (2017)). Additionally, the authors of that study provided a correction factor (CF = 2.86; 35 percent) for Southern California but left open the appropriateness of that factor given the limited data available at the time. For these reasons, having separate correction factors for each of the seasons is more appropriate as detailed in Section 11.1.5 (*Phoca vitulina*, Pacific Harbor Seal) of the Navy's density technical report (U.S. Department of the Navy, 2017b).
143	Federal: F02-04	(2) using the 2015 monk seal abundance estimate from Baker et al. (2016) and an at-sea correction factor of 63 percent for the MHI based on Baker et al. (2016) and 69 percent for the NWHI based on Harting et al. (2017);	As detailed in Section 11.1.4 (*Neomonachus schauinslandi*, Hawaiian Monk Seal) of the Navy's density technical report (U.S. Department of the Navy, 2017b), the Navy consulted with the researchers and subject matter experts at the Pacific Science Center and the Monk Seal Recovery Team regarding the abundance estimates, at sea correction factors, and distribution for monk seals in the Hawaiian Islands during development of the Draft EIS/OEIS throughout 2015 and the summer of 2016. The Navy incorporated the results of those consultations, including unpublished data, into the analysis of monk seals. Additional details in this regard to monk seal distributions and population trends as reflected by the abundance in the Hawaiian Islands are presented in the Draft EIS/OEIS in Section 3.7.2.2.9.2 (Habitat and Geographic Range) and Section 3.7.2.2.9.3 (Population Trends). The Navy has continued ongoing communications with researchers at the Pacific Islands Science Center and elsewhere, has accounted for the findings in the citations noted by MMC (Baker et al. 2016; Harting et al. 2017) as well as information in forthcoming publications provided ahead of publication

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
			via those researchers (cited as in prep), and specifically asked for and received concurrence from subject matter experts regarding specific findings presented in the Draft EIS/OEIS regarding monk seals. The Navy also considered (subsequent to publication of the Draft EIS/OEIS) the new Main Hawaiian Islands haulout correction factor presented in the publication by Wilson et al. (2017, which would be inconsistent with the use of the Baker et al. (2016) correction factors suggested by MMC), or the Harting et al. (2017) correction factor, and has considered the new abundance numbers presented in the Draft 2016 Stock Assessment Report, which first became available in January 2018. It is the Navy's assessment that a revision of the monk seal at-sea density would only result in small changes to the predicted effects and certainly would not change the conclusions presented in the Draft EIS/OEIS regarding impact on the population or the impact on the species. The Navy assumes that as part of the ongoing regulatory discussions with NMFS, changes to estimates of effects can be best dealt with given Wilson et al. (2017) has now also provided a totally new haulout correction factor for the Main Hawaiian Islands that was not considered in Baker et al. (2016), Harting et al. (2017), or the new draft 2016 SAR. The Navy would note that the driver behind the potential need for this revision is that monk seals have continued to increase in number in Hawaii and faster in areas where Navy has been conducting more frequent training and testing.
144	Federal: F02-05	(3) using the same representative area for elephant seals, northern fur seals, Guadalupe fur seals, and California sea lions;	Navy has consulted with various subject matter experts regarding the abundances and distributions used in the Draft EIS/OEIS analyses for these species and based on those consultations and the literature available, the Navy

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
			believes that the findings presented in the Draft EIS/OEIS and supporting technical reports provides the most accurate assessments available for these species. Given the demonstrated differences in the at-sea distributions of elephant seals, northern fur seals, Guadalupe fur seals, and California sea lions (Gearin, Melin, DeLong, Gosho, & Jeffries, 2017; Lowry et al., 2014; Lowry, Nehasil, & Jaime, 2017; Norris, 2017; Norris, DeRango, DiGiovanni, & Field, 2015; Robinson et al., 2012; University of California Santa Cruz and National Marine Fisheries Service, 2016), it would not be appropriate to use the same representative area for distributions of these species population abundances. For example, California sea lions forage predominantly within 20 nautical miles from shore (Lowry & Forney, 2005), while tag data shows that many elephant seals (Robinson et al., 2012) and Guadalupe fur seals (Norris, 2017) seasonally forage in deep waters of the Pacific well outside the boundaries of the HSTT Study Area.
145	Federal: F02-06	(4) using an increasing trend of 3.8 percent annually for the last 15 years for elephant seals as part of the California population and at least 31,000 as representative of the Mexico population based on Lowry et al. (2014); and	As detailed in Section 11.1.3 (*Mirounga angustirostris*, Northern Elephant Seal) of the Navy's density technical report (U.S. Department of the Navy, 2017b), the Navy considered a number of factors in the development of the data for this species including the fact that not all of the elephant seal population is likely to occur exclusively within the Southern California portion of the HSTT Study Area. Given that the three main rookeries considered in this analysis are located at the northern boundary of the Study Area, that elephant seals migrate northward after the breeding season, and in consultation with subject matter experts, the Navy believes the current abundance used is the analysis represents a conservative overestimate of the number of elephant seals likely to be

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
			effected by Navy activities in the HSTT Study Area, and is based on the best available science.
146	Federal: F02-07	(5) using an at-sea correction factor of 44 percent for the cold season and 48 percent for the warm season for California sea lions based on Lowry and Forney (2005).	The citation (Lowry & Forney, 2005) used as the basis for this recommendation specifically addressed the use of the Central and Northern California at-sea correction factor elsewhere, with the authors stating; "In particular, it would not be appropriate for regions where sea lions reproduce, such as in the Southern California Bight (SCB) and in Mexico, …" Given the waters of the Southern California Bight and off Mexico overlap the HSTT Study Area and since the authors of the cited study specifically recommended not using the correction factor in the manner MMC suggests, the Navy does not believe use of that correction factor for the HSTT Study Area would be appropriate.
147	Federal: F02-08	In addition, the Commission recommends that the Navy (1) specify the assumptions made and the underlying data that were used for the at-sea correction factors for Guadalupe and northern fur seals and	Guadalupe fur seal – Additional detail regarding the data used for the analysis of Guadalupe fur seals has been added to the HSTT Final EIS/OEIS Section 3.7.2.2.8 (Guadalupe Fur Seal (*Arctocephalus townsendi*)). The Navy had integrated the latest (September 2017) unpublished data for Guadalupe fur seals from researchers in the U.S. and Mexico into the at-sea correction factor and density distribution of the species used in the modeling, but consultations with experts in academia and at the NMFS Science Centers and their recommendations had not been finalized before release of the Draft EIS/OEIS. The Navy did not consider this revision of the text critical for the draft NEPA document since the new data did not provide any significant change to the conclusions reached regarding the Guadalupe fur seal population. In fact, the data indicates an increase in the population and expansion of their

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
			range concurrent with decades of ongoing Navy training and testing in the SOCAL range complex. Northern Fur Seal – As presented in Section 11.1.2 (*Callorhinus ursinus*, Northern Fur Seal) of the Navy's density technical report (U.S. Department of the Navy, 2017b), the correction factor percentages for northern fur seals potentially at sea were derived from the published literature as cited (Antonelis, Stewart, & Perryman, 1990; Ream, Sterling, & Loughlin, 2005; Roppel, 1984).
148	Federal: F02-09	(2) for all future DEISs, consult with experts in academia and at the NMFS Science Centers to develop more refined pinniped density estimates that account for pinniped movements, distribution, at-sea correction factors, and density gradients associated with proximity to haul-out sites or rookeries.	Navy did and will continue to consult with authors of the papers relevant to the analyses as well as other experts in academia and at the NMFS Science Centers during the development of the Navy's analyses. During the development of the HSTT Draft EIS/OEIS and as late as September 2017, the Navy had ongoing communications with various subject matter experts and specifically discussed pinniped movements, the distribution of populations within the study area to support the analyses, the pinniped haulout or at-sea correction factors, and the appropriateness of density gradients associated with proximity to haul-out sites or rookeries. As shown in the references cited, the seminal personal communications with researchers have been made part of the public record, although many other informal discussions with colleagues have also assisted in the Navy's approach to the analyses presented. Navy acknowledges that there have been previous MMC comments on other Navy range complex documents regarding the use of satellite tag movement and location data to derive at-sea pinniped density data, but that Navy's previous responses to those comments remain valid. Additionally, the MMC has noted that the, "…

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
			Commission continues to believe that data regarding movements and dispersion of tagged pinnipeds could yield better approximations of densities than the methods the Navy currently uses." The Navy acknowledges that in comments to previous Navy EIS/OEIS analyses, the MMC has recommended this untried approach and notes that responses to those previous comments were provided. The Navy notes that there have been papers suggesting the future application of Bayesian or Markov chain techniques for use in habitat modeling (e.g., (Redfern et al., 2006)) and overcoming the bias introduced by interpretation of population habitat use based on non-randomized tagging locations (e.g., (Whitehead & Jonsen, 2013)). However, the use of satellite tag location data in a Bayesian approach to derive cetacean or pinniped densities at sea has yet to be accepted, implemented, or even introduced in the scientific literature. This issue was in fact recently discussed as part of the Density Modeling Workshop associated with the October 2017 Society for Marine Mammalogy conference. The consensus of the marine mammal scientists present was that while pinniped tag data could provide a good test case, it realistically was unlikely to be a focus of the near-term research. The working group determined that a focused technical group should be established to specifically discuss pinnipeds and data available for density surface modelling in the future. Therefore, consistent with previous assessments and based on recent discussions with subject matter experts in academia, the NMFS Science Centers, and the National Marine Mammal Laboratory, and given there is no currently established methodology for implementing

Table H-3: Comment Response Matrix (continued)

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			the approach suggested by MMC, the Navy believes that attempting to create and apply a new density derivation method would introduce additional levels of uncertainty into density estimations. For these reasons, the Navy will not, at the present time, attempt to provide density estimates based on pinniped tracking data. Publications reporting on satellite tag location data have been and will continue to be used to aid in the understanding of pinniped distributions and density calculations as referenced in the Draft EIS/OEIS and Navy's Marine Species Density Database Technical Report. The Navy will continue, as it has in the past, to refine pinniped density and distributions using telemetry data and evolving new techniques (such as passive acoustic survey data) in development of the Navy's analyses.
Foreign Navies			
149	Organizations: O15-01 O15-02 O03-03 O16-01 Individuals: MONNI-03	There were 5 comments submitted questioning the specifics or lack thereof in numbers for foreign military participants in events such as RIMPAC and other future activities as analyzed in the EIS/OEIS.	As stated in Appendix A (A.2.1.2 – Rim of the Pacific Exercise) of the HSTT Draft EIS/OEIS, "Rim of the Pacific includes participation by multiple nations (in 2016 included 26 nations, 45 ships, 5 submarines, more than 200 aircraft, and 25,000 personnel)." RIMPAC exercises are comprised of a number of individual events, such as live-fire gunnery and missile exercises, maritime interdiction and vessel boarding, surface warfare, undersea warfare, naval maneuvers, air defense exercises, as well as explosive munitions disposal, diving and salvage operations, mine clearance operations, and an amphibious landing. These activities are the same type of activities the Navy conducts throughout the year, but as individual, unrelated events. The number and location of all of the individual activities included during RIMPAC can be found in Table 2.6-1 and

Table H-3: Comment Response Matrix (continued)

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			are described in detail in Appendix A (Navy Activity Descriptions). The Navy routinely predicts the activities it will be conducting years in the future, to be analyzed for environmental and regulatory compliance. This includes future RIMPAC exercises. It is important to note that the Navy is then bound by the limits of its expected types and levels of activities. If a need arises that exceeds those predicted activities, the Navy would be required to conduct additional environmental analysis.
150	Organizations: O05-04	There are insufficient details on the actual training activities making it difficult for the public and decision makers to adequately assess the potential impacts. For example the DEIS should include information on all Navies and the number of all ships involved in RIMPAC activities. There is no evidence that activities covered under the DEIS are inclusive of those of foreign navies.	Appendix A (Navy Activity Descriptions) describes all of the Navy's proposed activities, including RIMPAC. While RIMPAC varies each year, participation in 2016 included "26 nations, 45 ships, 5 submarines, more than 200 aircraft, and 25,000 personnel" as described in Appendix A (Navy Activity Descriptions). The Navy's analysis of RIMPAC considers the activities proposed to be undertaken by all participants including foreign navies that are in furtherance of the RIMPAC exercise. Under international law, a foreign naval vessel does not have a legal obligation to follow domestic U.S. regulations. However, before a foreign navy participates in RIMPAC, the U.S. Navy request foreign vessels to comply with U.S. protective measures and standards within the U.S. territorial sea and the international waters that comprise the U.S. Exclusive Economic Zone.
Section 106/Impacts to Hawaiian Sovereignty/Hawaiian Culture			
151	Individuals: DAYPA-01 STESH-02	Interested in section 106; Cultural.	The Navy completed Section 106 consultation and conducted several Section 106 meetings across the main Hawaiian Islands (Oahu, Hawaii, Maui, and Kauai), as part of the Section 106 process.
152	Organization: O09-02	A number of individuals expressed concerns as native Hawaiians that the proposed activities are illegal.	The Navy thanks you for your comment and we appreciate your interest in this project and its

Table H-3: Comment Response Matrix (continued)

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	Individuals: BENKA FERHA GASNO-02 GUMKA HARIS HOLWI-01 MOTPU-04 PISKE SANDA-02 STERO-01 WAIMA		accompanying environmental documentation. However, the information you have presented on territory and sovereignty is beyond the scope of this document and should be directed to the U.S. Department of State. Thank you again for taking the time to comment.
Modeling			
153	Federal: F02-01	Accordingly, the Commission suggests that, if the computation time is not overly burdensome, the Navy consider increasing the iterations from 30 to at least 200 for activities that have yet to be modeled for Phase III and for all activities in Phase IV.	The 30 iterations used in NAEMO represent the number of iterations run for each of the four seasons analyzed in HSTT Phase III, which results in a total of 120 iterations per year for each event analyzed. For other areas where only warm and cold seasons are analyzed, the number of iterations per season is increased to 60 so that the same 120 iterations per year are maintained. The Navy reached this number of iterations by running two iterations of a scenario and calculating the mean of exposures, then running a third iteration and calculating the running mean of exposures, then a fourth iteration and so on. This is done until the running mean becomes stable. Through this approach, it was determined 120 iterations was sufficient to converge to a statistically valid answer and provides a reasonable uniformity of exposure predictions for most species and areas. There are a few exceptions for species with sparsely populated distributions or highly variable distributions. In these cases, the running mean may not flatten out (or become stable). However, there were so few exposures in these

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
			cases that while the mean may fluctuate; the overall number of exposures did not result in significant differences in the totals. In total, the number of simulations conducted for HSTT Phase III exceeded six million simulations and produced hundreds of terabytes of data. Increasing the number of iterations, based on the discussion above, would not result in a significant change in the results, but would incur a significant increase in resources (e.g., computational and storage requirements). This would divert these resources from conducting other more consequential analysis without providing for meaningfully improved data. The Navy is continually looking at ways to improve NAEMO and reduce data and computational requirements. As technologies and computational efficiencies improve, the Navy will evaluate these advances and incorporate them where appropriate.
154	Federal: F02-10	Therefore, the Commission again recommends that the Navy use its spatially and temporally dynamic simulation models (e.g., randomly-generated munition trajectories and animat simulations) rather than simple probability calculations to estimate strike probabilities and numbers of takes from expended munitions and non-explosive materials.	The recommendation of the Marine Mammal Commission to use a dynamic simulation model to estimate expended munitions and non- explosive materials strike probability was considered, but the Navy found that the current analysis used in the EIS/OEIS is more conservative and over estimates the potential impacts to marine mammals. An analysis of direct strike resulting from expended materials conducted in a dynamic simulation model such as NAEMO would also be a probability analysis, however it would be conducted in a different manner. The current analysis provides an overestimation of the probability of a strike for the following reasons: (1) calculates the probability of a single military item (of all the items expended over the course of the year) hitting a single animal at its species' highest seasonal density; (2) does not take into account

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
			the possibility that an animal may avoid military activities; (3) does not take into account the possibility that an animal may not be at the water surface; (4) does not take into account that most projectiles fired during training and testing activities are fired at targets, and not all projectiles would hit the water with their maximum velocity and force; and (5) does not quantitatively take into account the Navy avoiding animals that are sighted through the implementation of mitigation measures. In order to be more conservative, the Navy has will continue using this method.
155	Federal: F02-11	For all of these reasons, the Commission recommends that the Navy refrain from using cut-off distances in conjunction with the Bayesian BRFs and re-estimate the numbers of marine mammal takes based solely on the Bayesian BRFs. Use of cut-off distances could be perceived as an attempt to reduce the numbers of takes, which is discussed in a subsequent section of this letter.	The consideration of proximity (cut-off distances) was part of the criteria developed in consultation with NMFS and was applied within the Navy's acoustic effects model. Cut-off distances were used to better reflect the take potential for military readiness activities as defined in the MMPA. As stated in Draft EIS/OEIS Section 3.7.3.1.2.1 (Methods for Analyzing Impacts from Sonar and Other Transducers), the derivation of the behavioral response functions and associated cut-off distances is provided in the technical report titled *Criteria and Thresholds for U.S. Navy Acoustic and Explosive Effects Analysis (Phase III)*. Briefly, much of the data used to derive the behavioral response functions was from nearby, scaled sources, thereby potentially confounding results since it is difficult to tell whether the focal marine mammal is reacting to the sound level or the proximity of the source and/or vessel amongst other potentially confounding contextual factors that are unlike actual Navy events for which the BRF's are being derived. To account for these non-applicable contextual factors, all available data on marine mammal reactions to actual Navy activities and

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
			sound sources (or other large-scale activities such as seismic surveys when information on proximity to sonar sources is not available for a given species group, e.g., harbor porpoises) were reviewed to find the farthest distance to which significant behavioral reactions were observed. These distances were rounded up to the nearest 5 or 10 km interval, and for moderate to large scale activities using multiple or louder sonar sources, these distances were greatly increased—doubled in most cases. The Navy's BRF's applied within these distance is currently the best known method for providing the public and regulators with a more realistic (but still conservative where some uncertainties exist) estimate of impact and potential take under military readiness for the proposed actions within this EIS/OEIS.
156	Federal: F02-13	The Commission recommends that the Navy (1) explain why the constants and exponents for onset mortality and onset slight lung injury thresholds for Phase III have been amended, (2) ensure that the modified equations are correct, and (3) specify whether any additional assumptions were made.	As stated in Section 3.7.3.2.2.1 (Methods for Analyzing Impacts from Explosives), the derivation of the explosive injury equations is provided in the technical report titled *Criteria and Thresholds for U.S. Navy Acoustic and Explosive Effects Analysis (Phase III)*.
157	Federal: F02-17	The Navy should have been able to query the dosimeters of the animats to verify whether its 5-percent assumption was valid, but on its face that assumption has no scientific basis. Given that sound sources are moving, it may not be until later in an exercise that the animal is close enough to experience PTS and it is those few close pings that contribute to the potential to experience PTS. Since both sources and animals are moving during an exercise, whether an animal is initially beyond the PTS zone has no bearing on whether it will later come within close range. In addition, Navy vessels may move faster than the speed animals are capable of moving to evacuate the area.	As stated in the Draft EIS/OEIS Section 3.7.3.1.2.1 (Methods for Analyzing Impacts from Sonar and Other Transducers), the consideration of marine mammals avoiding the area immediately around the sound source is provided in the technical report *Quantifying Acoustic Impacts on Marine Mammals and Sea Turtles: Methods and Analytical Approach for Phase III Training and Testing*. This report was provided as supporting documentation to the Draft EIS/OEIS. As the commenter correctly articulates: "For avoidance, the Navy assumed that animals present beyond the range to onset PTS for the first three to four pings are assumed to avoid any additional exposures at levels that could cause PTS. That

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
			equated to approximately 5 percent of the total pings or 5 percent of the overall time active; therefore, 95 percent of marine mammals predicted to experience PTS due to sonar and other transducers were instead assumed to experience TTS." As discussed in the *Quantifying Acoustic Impacts on Marine Mammals and Sea Turtles: Methods and Analytical Approach for Phase III Training and Testing*, animats in the Navy's acoustic effects model do not move horizontally or "react" to sound in any way, necessitating the additional step of considering animal avoidance of close-in PTS zones. This approach is fully supported by the best available science. Based on a growing body of behavioral response research, animals do in fact avoid the immediate area around sound sources to a distance of a few hundred meters or more depending upon the species. Avoidance to this distance greatly reduces the likelihood of impacts to hearing such as temporary and permanent threshold shift (TTS and PTS, respectively). Specifically, the ranges to PTS for most marine mammal groups are within a few tens of meters and the ranges for the most sensitive group, the HF cetaceans, average about 200 m, to a maximum of 270 m in limited cases; however, HF cetaceans such as harbor porpoises have been observed reacting to anthropogenic sound at greater distances than other species and are likely to avoid their zones to hearing impacts (TTS and PTS) as well. Querying the dosimeters of the animats would not produce useful information since, as discussed previously, the animats do not move in the horizontal and are not programmed to "react" to sound or any other stimulus.

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
158	Federal: F02-19	Therefore, the Commission recommends that the Navy (1) specify what modeling method and underlying assumptions were used to estimate the PTS and TTS zones for pile-driving activities and (2) clarify why those zones were estimated to be the same for LF and HF during impact pile driving.	As stated in Section 3.7.3.1.4.1 (Methods for Analyzing Impacts from Pile Driving), the Navy used measured values for source levels and transmission loss from pile driving of the Elevated Causeway System, the only pile driving activity included in the Proposed Action of this EIS/OEIS. These recorded source waveforms were weighted using the auditory weighting functions. Low-frequency and high-frequency cetaceans have similar ranges for impact pile driving since low-frequency cetaceans would be relatively more sensitive to the low-frequency sound which is below high-frequency cetaceans best range of hearing. Neither the NMFS user spreadsheet nor Navy Acoustic Effects Model (NAEMO) were required for calculations. An area density model was developed in MS Excel that calculated zones of influence to thresholds of interest (e.g., behavioral response) based on durations of pile driving and the aforementioned measured and weighted source level values. The resulting area was then multiplied by density of each marine mammal species that could occur within the vicinity. This produced an estimated number of animals that could be impacted per pile, per day, and overall during the entire activity for both the impact pile driving and vibratory removal phases.
159	Individual: HARCO-06	The Navy's refined analysis of anti-submarine warfare activities results in reduced levels of active sonar analyzed. The new presentation of anti-submarine warfare activities more accurately reflects the variability in the number of certification related events ... conducted per year... This new analysis also better accounts for a portion of unit level surface ship Tracking Exercise requirements being met during coordinated/integrated anti-submarine warfare training and major training exercises, or	For a complete description of the approach taken by the Navy to estimate impacts, including an explanation of the Navy's acoustic model, see the technical report, *Quantifying Acoustic Impacts on Marine Mammals and Sea Turtles: Methods and Analytical Approach for Phase III Training and Testing*, available on the HSTT project website at https://hstteis.com/Documents/2017-Hawaii-

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
		through synthetic training. These refinements to the analysis result in fewer hours of acoustic sources, such as hullmounted mid-frequency active acoustic systems, when estimating marine mammal exposures from training events. Cite evidence to demonstrate that this theoretical model accurately reflects impacts, especially in years when impacts are greater.	Southern-California-Training-and-Testing-Draft-EIS-OEIS/Supporting-Technical-Documents.
160	Organization: O05-08 Individual: MONNI-09	2 comments stated that take limits are arbitrarily high.	The number of marine mammal takes estimated in the Navy's analysis result from years of research and application of the best available science in acoustic modeling. The Navy has consulted with NMFS under the MMPA and ESA with respect to the number of takes estimated to occur.
161	Organization: O04-50	Thresholds and weighting systems for auditory impacts The criteria that SPAWAR has produced to estimate temporary and permanent threshold shift in marine mammals are erroneous and non-conservative. Wright (2015) has identified several statistical and numerical faults in the Navy's approach, such as pseudo-replication and inconsistent treatment of data, that tend to bias the proposed criteria towards an underestimation of effects. Similar and additional issues were raised by a dozen scientists during the public comment period on the draft criteria held by NMFS. At the root of the problem is the Navy's broad extrapolation from a small number of individual animals, mostly bottlenose dolphins, without taking account of what Racca et al. (2015b) have succinctly characterized as a "non- linear accumulation of uncertainty." The auditory impact criteria should be revised.	The permanent threshold shift/temporary threshold shift criteria and thresholds, as set by NMFS, include numerous conservative assumptions, such as (1) Navy assumes no recovery of hearing during time intervals between intermittent exposures. However, multiple studies from humans, terrestrial mammals, and marine mammals have demonstrated less temporary threshold shift from intermittent exposures compared to continuous exposures with the same total energy because hearing is known to experience some recovery in between noise exposures. Therefore, the Navy's approach is known to over-estimate the effects of intermittent noise sources such as tactical sonars. (2) Marine mammal temporary threshold shift data have shown that, for two exposures with equal energy, the longer duration exposure tends to produce a larger amount of temporary threshold shift. Since most marine mammal temporary threshold shift data have been obtained using exposure durations of tens of seconds up to an hour, much longer than the durations of many

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
			tactical sources, the use of the existing marine mammal temporary threshold shift data tends to over-estimate the effects of sonars with shorter duration signals. Since marine mammal hearing and noise-induced hearing loss data are limited, both in the number of species and in the number of individual's available, attempts to minimize pseudoreplication would further reduce these already limited data sets. Specifically, with marine mammal behavioral temporary threshold shift studies, behaviorally derived data are only available for two mid-frequency cetacean species (bottlenose dolphin, beluga) and two phocids in water pinniped species (harbor seal and northern elephant seal), with OW pinnipeds and high-frequency cetaceans only having behaviorally derived data from one species (harbor porpoises and California sea lions). Arguments from Wright (2015) regarding pseudo replication within the temporary threshold shift data are therefore largely irrelevant in a practical sense because of limited data. Multiple data points were not included for the same individual at a single frequency; if multiple data existed at one frequency, the lowest temporary threshold shift onset was always used. There is only a single frequency where temporary threshold shift onset data exist for two individuals of the same species: 3 kHz for dolphins. Their temporary threshold shift (unweighted) onset values were 193 and 194 Db re 1 µPa2s. Thus, the Navy believes that the current approach makes the best use of the given data. Appropriate means of reducing pseudoreplication may be considered in the future, if more data become available. Many other comments from Wright (2015) and the comments from Racca et al. (2015) appear to be erroneously based on the idea that

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
			the shapes of the auditory weighting functions and temporary threshold shift/permanent threshold shift exposure thresholds are directly related to the audiograms; i.e., that changes to the composite audiograms would directly influence the threshold shift/permanent threshold shift exposure functions [e.g., Wright (2015) describes weighting functions as "effectively the mirror image of an audiogram" (p. 2) and states "The underlying goal was to estimate how much a sound level needs to be above hearing threshold to induce temporary threshold shift." (p. 3) — both statements are incorrect and suggest a fundamental misunderstanding of the criteria/threshold derivation.] This would require a constant (frequency-independent) relationship between hearing threshold and temporary threshold shift onset that is not reflected in the actual marine mammal temporary threshold shift data. Attempts to create a "cautionary" outcome by artificially lowering the composite audiogram thresholds would not necessarily result in lower temporary threshold shift/permanent threshold shift exposure levels, since the exposure functions are to a large extent based on fitting mathematical functions to the existing temporary threshold shift data.
162	Organization: O04-51	(4) Behavioral response thresholds (a) Data sources For example, two of the proposed behavioral response functions rely substantially on captive animal studies, even though it is generally accepted that captive animals, especially (but not limited to) those that have previously been trained, are likely to be less responsive to intrusive sound.144 Every data point that informs the pinniped function, and nearly two-thirds of the data points informing the odontocete function (30/49),	Please see the *Criteria and Thresholds for U.S. Navy Acoustic and Explosive Effects Analysis (Phase III)* technical report (U.S. Department of the Navy, 2017a) for details on how the Navy accounted for the differences in captive and wild animals in the development of the behavioral response functions. The Navy uses the best available science in the analysis which has been reviewed by external scientists and approved by NMFS. The Navy has utilized all available

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
		are derived from a captive animal study. In the case of the odontocete function, the reliance on captive studies exacerbates that function's heavy dependence on the bottlenose dolphin, a species that is generally considered relatively insensitive, to represent a diverse set of taxa with divergent sensitivity and reactiveness to mid- frequency anthropogenic noise.	data for the development of updated criteria and threshold, and limiting the data to the small number of field studies would not provide enough data with which to develop the new risk functions. In addition, the Navy accounts for the fact that captive animals may be less sensitive, and the scale at which a moderate-to-severe response was considered to have occurred is different for captive animals than for wild animals, as the Navy understands those responses will be different.
163	Organization: O04-52	Additionally, the risk functions do not incorporate (nor does the Navy apparently consider) a number of relevant studies on wild marine mammals, such as a passive acoustic study on blue whale vocalizations and a tagging study on behavioral responses to dipping sonar, for which received levels are either available or can be estimated.	The new risk functions were developed in 2016 before several recent papers were published and before any data from ongoing efforts were available. The Navy had to finalize the 2016 risk functions in order to meet regulator deadlines required for the HSTT EIS and NMFS consultations. Part of this finalization also included a thorough review and approval by leading subject matter experts at NMFS.. The Navy continues to evaluate the information as new science is made available. The criteria have been rigorously vetted within the Navy community, among scientists during expert elicitation, and then reviewed by the public before being applied. It is unreasonable to revise and update the criteria and risk functions every time a new paper is published without more substantive review across the same spectrum of expertise. However, it remains the Navy's opinion that to date nothing has been published that changes the fundamental scientific principles of the Navy's 2016 criteria and risk functions. These new and future papers provide additional valuable qualitative information, and the Navy has already begun to consult them for updates to the criteria in the future, when the next round of updated criteria will be developed. Regarding consideration of research findings involving passive

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
			acoustic study on blue whale vocalizations and behavior, the Navy considered multiple recent references (including but not limited to (DeRuiter et al., 2017; Friedlaender et al., 2016; Lesage, Omrane, Daniol-Valcroze, & Mosnier, 2017; Lomac-MacNair & Smultea, 2016; B. R. Mate et al., 2016; B. R. Mate et al., 2015; Paniagua-Mendoza, Gendron, Romero-Vivas, & Hildebrand, 2017)). Thus far, no new information has been published or otherwise conveyed that would fundamentally change the assessment of impacts or conclusions of this EIS/OEIS. To be included in the behavioral response function, data sets needed to relate known or estimable received levels to observations of individual or group behavior. Melcón (2012) does not relate observations of individual/group behavior to known or estimable received levels [at that individual/group]. In Melcón (2012), received levels at the HARP buoy averaged over many hours are related to probabilities of D-calls, but the received level at the blue whale individuals/group are unknown. This was the reason Melcón (2012) did not have the necessary information to use in the Navy's new risk functions. The research that generated a 2017 paper on beaked whale response to dipping sonar is still ongoing under Navy funding. There are several important caveats to this data set (such as proximity to source, source levels, etc.) that are still being evaluated by the researchers with additional field experiments and analysis through 2020. The Navy will reassess any new information at the study's completion for inclusion in future risk function development.
164	Organization: O04-53	For this reason and others, and given the obvious importance of this analysis for future acoustic impact analyses, we ask the	As stated in EIS/OEIS Section 3.7.3.1.2.1 (Methods for Analyzing Impacts from Sonar and Other Transducers),

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
		Navy to make additional technical information available, including expert elicitation and peer review (if any), so that the public can fully comment pursuant to NEPA.	the derivation of the behavioral response functions is provided in the technical report titled *Criteria and Thresholds for U.S. Navy Acoustic and Explosive Effects Analysis (Phase III)*. The appendices to this report detail the specific data points used to generate the behavioral response functions. Data points come from published data that is readily available and cited within the technical report.
165	Organization: O04-55	I Use of distance-based "cut-offs" Not only does this adjustment make no sense theoretically (again as the Commission observes) since distance is already incorporated in the responses functions as a contextual factor; not only are the chosen cut-offs based for each function on little to no data; but the results are inconsistent with the available data, including but not limited to blue whale feeding response, blue whale vocalization response, and opportunistic data from strandings. As the Commission notes, "Use of cut-off distances could be perceived as an attempt to reduce the numbers of takes." We urge the Navy to abandon this arbitrary, highly concerning element in its new analysis.	The consideration of proximity (cut-off distances) was part of the criteria developed in consultation with NMFS and was applied within the Navy's acoustic effects model. Cut-off distances were used to better reflect the take potential for military readiness activities as defined in the MMPA. As stated in the Draft EIS/OEIS Section 3.7.3.1.2.1 (Methods for Analyzing Impacts from Sonar and Other Transducers), the derivation of the behavioral response functions and associated cut-off distances is provided in the technical report titled *Criteria and Thresholds for U.S. Navy Acoustic and Explosive Effects Analysis (Phase III)*. Navy considered the data presented in the comment's footnoted references (Goldbogen et al., 2013; Melcón et al., 2012; Southall et al., 2006) as well as all other applicable data. Briefly, much of the data used to derive the behavioral response functions was from nearby, scaled sources, thereby potentially confounding results since it is difficult to tell whether the focal marine mammal is reacting to the sound level or the proximity of the source and/or vessel amongst other potentially confounding contextual factors that are unlike actual Navy events for which the BRF's are being derived. To account for these non-applicable contextual factors, all available data on marine mammal reactions to actual Navy activities and sound sources (or other

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
			large-scale activities such as seismic surveys when information on proximity to sonar sources is not available for a given species group, e.g., harbor porpoises) were reviewed to find the farthest distance to which significant behavioral reactions were observed. These distances were rounded up to the nearest 5 or 10 km interval, and for moderate-to large-scale activities using multiple or louder sonar sources, these distances were greatly increased—doubled in most cases. The Navy's BRF's applied within these distances is currently the best known method for providing the public and regulators with a more realistic (but still conservative where some uncertainties exist) estimate of impact and potential take under military readiness for the proposed actions within this EIS/OEIS.
166	Organization: O05-02 O03-01	Unfortunately, the DEIS falls far short of these mandates and fails to satisfy the Navy's legal obligations under NEPA. Specifically the DEIS should include more transparency regarding species specificity on threshold modeling.	A technical report, *Criteria and Thresholds for U.S. Navy Acoustic and Explosive Effects Analysis (Phase III)* (U.S. Department of the Navy, 2017a), is cited many times throughout the EIS/OEIS and is available on the HSTT EIS/OEIS website. This report includes detailed information on how the criteria and thresholds were developed for the Phase III EISs. Additionally, information on the auditory weighting functions and exposure functions for marine mammals can be found in the EIS/OEIS in Section 3.7.3.1.2.1 (Methods for Analyzing Impacts from Sonar and Other Transducers) and Section 3.7.3.2.2.1 (Methods for Analyzing Impacts from Explosives). The same information for sea turtles can be found in Sections 3.8.3.1.2.1 and 3.8.3.2.2.1.
167	Organization: O07-04	• By the Navy's own estimates some 12.6 million takes of whales and dolphins will occur over the 5 year period as a result of HSTT activities, including over 3,300 instances of Level A harassment and 13 mortalities. Some of these "takes", including	The commenter implies that the estimated 24 million takes of marine mammals will result in physical harm to marine mammals. The vast majority of takes under the MMPA noted in the Draft EIS/OEIS are Level B

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
		injuries and mortalities, will be inflicted on individuals from critically endangered species and stocks, and yet, this will not affect those species or stock's annual rates of recruitment or survival.	harassment involving behavioral response which have the "potential to disturb behavioral patterns," and involve no physical harm or injury. As noted in Appendix E (Estimated Marine Mammal and Sea Turtle Impacts from Exposure to Acoustic and Explosive Stressors Under Navy Training and Testing Activities) and in the species breakdown in Chapter 3.7 (Marine Mammals), these instances of Level B harassment take place over many species, many stocks, and many locations; not to specific populations or critically endangered species in particular. While the Navy does model all of its activities in order to estimate the potential number of takes of marine mammals, this is an overestimation due to various reasons listed in the EIS/OEIS. Actual impacts to marine mammals are further reduced by mitigation that will be implemented. For example, the Navy's estimated impacts to the Kohala resident stock do not take into consideration that the Navy has developed mitigation areas, one of which (the Hawaii Island Mitigation Area) overlaps the small and resident population area of the Kohala resident stock of melon-headed whales identified by Baird et al. (2015). These mitigation areas are likely to result in an avoidance or reduction of impacts from active sonar and explosives on several species of marine mammals within these areas, including the Kohala resident stock of melon-headed whales.
NEPA Compliance/Process			
168	Individual: HARCO-01 HARCO-02	A hearing needs to be held in Kona.	The decision on where to host public meetings is based on a variety of factors, including range of the Study Area and public interest in the project. Based on these factors, the Navy determined that a meeting in Hilo was the most efficient and effective at providing and receiving relevant information from the public.

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
169	Individual: MONNI-02	The EIS is insufficient for the following reasons: Missing comprehensive research on cetacean mass stranding deaths due to the following factors: panic, bubble formation and/or decompression sickness from Naval sonar: 1) Sonar caused panic reactions leading to strandings followed by death 2) Sonar caused decompression sickness (the bends) followed by death 3) The bends caused by sonar even in the absence of panic In relation to the above mentioned marine mammal deaths caused by panic reactions, decompression sickness and the bends caused sonar, in June 2012 I requested you include the following scientific literature in the EIS. As far as I can see they have not been included. I am again stating the findings in the following papers MUST be included in the EIS: D.S. Houser, R. Howard and S. Ridgway, 'Can Diving-Induced Tissue Nitrogen Supersaturation Increase the Chance of Acoustically Driven Bubble Growth in Marine Mammals?' 213 Journal of Theoretical Biology 183, 190 (2001). L.A. Crum, M.R. Bailey, J. Guan, P.R. Hilmo, S.G. Kargl, T.J. Matula, and O.A. Sapozhnikov, 'Monitoring Bubble Growth in Supersaturated Blood and Tissue ex vivo and the Relevance to Marine Mammal Bioeffects.' 6(3) Acoustics Research Letters Online 214 (2005). J. R. Potter, 'A Possible Mechanism for Acoustic Triggering of Decompression Sickness Symptoms in Deep-Diving Marine Mammals' Paper presented at the IEEE International Symposium on Underwater Technology 2004, Taipei Taiwan, April 2004.	The EIS/OEIS fully complies with NEPA and the extensive studies and analysis, in light of the best available science, exceeds the required hard look at impacts to marine mammals. All of the potential effects from Navy training and testing activities were analyzed in Chapter 3 (Affected Environment and Environmental Consequences) of the EIS/OEIS. See for example the discussion on nitrogen decompression in Section 3.7.3.1.1.1 (Injury, Nitrogen Decompression).
170	Individual: MORKI	Att: HSTT EIS/OEIS Project Manager, • The Navy EIS is insufficient for the following reasons.–. - More transparency/species specificity on threshold modeling - Information presented in the EIS needs to be more species	The EIS/OEIS fully complies with NEPA and the extensive studies and analysis, in light of the best available science, exceeds the required hard look at impacts to marine mammals. All of the potential effects from Navy training

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
		specific - Cleanup debris left behind - e.g., Unexploded ordinance - Insufficient details on training activities - Include information on all Navy (and other countries) involved in RIMPAC activities - No evidence that activities covered under the EIS are inclusive of those of foreign navies - Must require independent observe–s - Show that Navy is consulting with other science/ state of the art acoustic studies - e.g., warning sound - Look into alternatives to active sonar/ other ways to detect submarines - Take limits should be reduced as they are arbitrarily high • Lumping of the species and areas between Hawaii and California are a concern. Need two separate EIS for the two separate areas. • High seas migratory (highly migratory species) species, how are they impacted? Not just marine mammals but also the other species in the area need to be considered. Not sufficient detail on this. • Affirmative duty to protect under MMPA, a failure to minimize impact to "the least practicable adverse impact". Quote from MMPA-Section 1371(a)(5)(A)(i)(II)(aa). • Monitoring techniques including aerial surveys are not the best way to analyze the impacts and are unacceptable • Given these concerns, I support the no action alternative. Mahalo for listening to my concerns, Kirstin Morris 6335 Waipouli Rd. unit B Kapaa, HI. 96746	and testing activities were analyzed in Chapter 3 (Affected Environment and Environmental Consequences) of the EIS/OEIS. Appendix A (Navy Activity Descriptions) describes all of the Navy's proposed activities, including RIMPAC, which includes participation by other nations. Section 5.5.5 (Third-Party Observers) of the EIS/OEIS states the reasons why independent observers are generally not present on U.S. Navy vessels. The Navy believes the scope of this project is appropriate. Our analysis does take into account specific areas and species for both Southern California and Hawaii. All of the potential effects from Navy training and testing activities were analyzed in Chapter 3 (Affected Environment and Environmental Consequences) of the EIS/OEIS.
171	Organization: O02-01	For the reasons set forth below, similar fatal flaws persist in the DEIS for this latest round of HSTT activities. Moreover, the DEIS fails to take a "hard look" at impacts to marine mammals that NEPA mandates.	The Draft EIS/OEIS fully complies with NEPA and the extensive studies and analysis, in light of the best available science, exceeds the required hard look at impacts to marine mammals.
172	Organization: O02-09	the Navy must prepare a revised DEIS that considers alternatives that incorporate the time/area restrictions imposed by the 2015 Settlement, providing data and analysis that detail the benefits from continuing the protections the 2015 Settlement provides.	The Draft EIS/OEIS is current and sufficient. If the Proposed Action or environmental impacts change significantly, the Navy will supplement the EIS/OEIS at that time. Pursuant to 40 CFR 1502.14(f) appropriate mitigation measures can be considered outside the context of reasonable alternatives. As the Navy intends to apply selected mitigation measures to either

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
			alternative, the EIS/OEIS adequately discusses mitigation and considers all possible measures to minimize environmental impacts.
173	Organization: O02-20	To comply with NEPA, the Navy's revised analysis must take the requisite hard look at the impacts of HSTT activities causing permanent hearing loss more than 3,000 times and physically injuring over 100 marine mammals. While the DEIS acknowledges these harms will occur, it fails to include any population viability analyses or any other scientifically accepted inquiry to evaluate whether injury at these high levels would cause population-level harm.	With regard to population viability analyses or other scientifically accepted inquiry, the Navy did look at long-term impact to populations and concluded there would not be any. The Navy is currently in consultation with NMFS, whom will make determinations of whether the Navy's proposed actions will have a negligible impact on affected species and stocks. Further, the Navy is currently consulting with NMFS on mitigation measures to reduce any likely effect to population or stocks such that Navy training and testing will have the least practicable adverse impact on affected species and stocks.
174	Organization: O03-01	Unfortunately, the DEIS falls far short of these mandates and fails to satisfy the Navy's legal obligations under NEPA. Specifically the DEIS should include more transparency regarding species specificity on threshold modeling.	A technical report, Criteria and Thresholds for U.S. Navy Acoustic and Explosive Effects Analysis (Phase III) (U.S. Department of the Navy, 2017), is cited many times throughout the EIS/OEIS and is available on the HSTT EIS/OEIS website. This report includes detailed information on how the criteria and thresholds were developed for the Phase III EISs. Additionally, information on the auditory weighting functions and exposure functions for marine mammals can be found in the EIS/OEIS in Section 3.7.3.1.2.1 (Methods for Analyzing Impacts from Sonar and Other Transducers) and Section 3.7.3.2.2.1 (Methods for Analyzing Impacts from Explosives). The same information for sea turtles can be found in Sections 3.8.3.1.2.1 and 3.8.3.2.2.1.
175	Organization: O05-01	The DEIS is insufficient as it does not comply with both the letter and spirit of the law. Full compliance with the National Environmental Policy Act ("NEPA"), 42 U.S.C. 4321 et seq., is vital to ensuring that marine mammals and other marine life are	The Navy complied with all applicable environmental laws, including NEPA, and has used the best available science in the development of this EIS/OEIS.

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
		protected from unnecessary harm. As Congress intended when it passed NEPA, the Navy is required to employ rigorous standards of environmental review, including a comprehensive analysis of all practical alternatives, a full explanation of potential impacts, a reasonable and objective accounting of cumulative impacts, and a thorough description of mitigation measures that will significantly lessen environmental impacts.	
176	Organization: O09-03	At the public scoping meetings the people were only allocated 3 minutes to comment on a document that was hundreds of pages long. This was absolutely unreasonable. No one can make any rational oral comments on such a voluminous document in only 3 minutes. This make the process appear less then genuine and perfunctory. This is beneath the Navy and we expect better from the good people of the Navy.	From past experience, the Navy has concluded that the public hearing format used during the public hearings is the most conducive to effective dialogue. Speakers were initially allotted 3 minutes to make sure everyone had the opportunity to speak. Additional time for each speaker would not have allowed every speaker an opportunity to speak/share comments before the end of the meeting. However, those who wanted to speak again were given another 3 minutes while time permitted at the meeting.
177	Organization: O09-05	Lastly, we request that you extend the deadline for public comment. The time allocated for comments is much too short given the extent and size of the document. The public needs to have a reasonable time to consider and comment regarding such important decisions. If you do not extend the comment period then we wish to reserve our rights to comment further as we complete our review of the whole lengthy document.	The Navy understands that the EIS/OEIS is lengthy, however production and review of the final EIS/OEIS in order to maintain the timeline for Endangered Species Act (ESA) and Marine Mammal Protection Act (MMPA) permitting limits the amount of time possible for review. The Navy provided a 60-day review period, which is 15 days longer than the minimum recommended time.
178	Organization: O15-02	Doing an environmental impact statement (E.I.S.) for activities that will take place five years from now in Hawai'i and California is simply not possible.	The Navy routinely predicts the activities it will be conducting years in the future, to be analyzed for environmental and regulatory compliance. It is important to note that the Navy is then bound by the limits of its expected types and levels of activities. If a need arises that exceeds those predicted activities, the Navy would be required to conduct additional environmental analysis.

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
179	Organization: O15-04	The D.E.I.S. simply needs to be specific to be useful. It must cover a much shorter duration than five years. The decision-maker in this case is the US Navy, which makes the whole process absurd since the Navy both pays for the E.I.S. and approves it. The Navy must not be able to certify its own EIS. It perverts the spirit of N.E.P.A. we would challenge the D.E.I.S. on this basis.	As described in the Code of Federal Regulations (40 CFR 1500), it is the responsibility of the Federal Agency to implement the procedural provisions of the National Environmental Policy Act. Likewise, in accordance with the National Environmental Policy Act, the Federal Agency makes the decision. In the case of this EIS/OEIS, the "decision-maker" refers to the Secretary of the Navy, or designee, who is responsible for the approval of the Record of Decision. The selection and approval of an alternative by the decision-maker will be based on a review of all relevant facts, impact analyses, and comments received via the EIS/OEIS public participation process.
Study Area			
180	Organization: O05-10	Additionally, the "Study Area" is too large and should be divide into two Environmental Impact Statements. Throughout the DEIS "small spatial scale relative to the entire Study Area" is used to justify the take which is likely to occur. This is all done without a proper analysis of the cumulative impacts that marine life will experience as a result of either alternative 1 or alternative 2. These are just a few examples of issues for consideration and reassessment, and are in no way comprehensive. For all the above reasons, we urge the agencies to recommend the no action alternative.	The Navy believes the scope of this project is appropriate. Our analysis does take into account specific areas and species for both Southern California and Hawaii. The Navy, in cooperation with NMFS, has taken a hard look at the cumulative effects of the incremental impact of its proposed actions when added to other past present and future actions, against the appropriate resources and regulatory baselines. As required under NEPA, the level and scope of the analysis is commensurate with the potential impacts of the action as reflected in the resource-specific discussions in Chapter 3 (Affected Environment and Environmental consequences). The EIS/OEIS considered its activities alongside other actions in the region when those impacts are cumulatively significant. Past and present actions are also included in the analytical process as part of the affected environment baseline conditions presented in Chapter 3. The Navy has done so in accordance with the

Table H-3: Comment Response Matrix (continued)

Reference Number	*Total Comments*	*Comment*	*Response*
			Council on Environmental Quality 1997 guidance. Per the guidance, a qualitative approach and best professional judgment are appropriate where precise measurements are not available. Where precise measurements and/or methodologies were available they were used. Guidance from the Council on Environmental Quality states it "is not practical to analyze cumulative effects of an action on the universe; the list of environmental effects must focus on those that are truly meaningful." Information on the Navy's analysis is provided in Section 4.1.1. (Determination of Significance). Lastly, all of the potential effects on marine mammals from Navy training and testing, with regards to populations and/or stocks, were analyzed in Section 3.7 (Affected Environment and Environmental Consequences - Marine Mammals). Based on the best available science, it was determined that population-level impacts would not occur. The data and judgment relied on for cumulative impact analysis in Chapter 4 (Cumulative Impacts) of the EIS/OEIS is complemented and supported by the analysis in Chapters 3 (Affected Environment and Environmental Consequences) and 5 (Mitigation) and Appendix K (Geographic Mitigation Assessment). The Navy's alternatives were developed in order to satisfy the Navy's purpose and need related to fulfilling its Title 10 requirements. The No Action Alternative does not meet the Navy's purpose and need.
181	State: S03	The proposed project is outside Department of Transportation, Harbors Division's (DOT-H) jurisdiction and does not seem to impact DOT-H's operations or infrastructure. We suggest consulting the maritime industry as the project area may affect shipping routes.	As described in the HSTT EIS/OEIS in Section 3.11 (Socioeconomics), the proposed activities would not affect shipping routes.

REFERENCES

Antonelis, G. A., Stewart, B. S., & Perryman, W. F. (1990). Foraging characteristics of female northern fur seals (*Callorhinus ursinus*) and California sea lions (*Zalophus californianus*). *Canadian Journal of Zoology, 68*, 150–158.

Baker, J. D., Harting, A. L., Johanos, T. C., & Littnan, C. L. (2016). Estimating Hawaiian monk seal range-wide abundance and associated uncertainty. *Endangered Species Research, 31*, 317–324. doi:10.3354/esr00782

DeRuiter, S. L., Langrock, R., Skirbutas, T., Goldbogen, J. A., Calambokidis, J., Friedlaender, A. S., & Southall, B. L. (2017). A multivariate mixed hidden Markov model for blue whale behaviour and responses to sound exposure. *The Annals of Applied Statistics, 11*(1), 362–392. doi:10.1214/16-aoas1008

Friedlaender, A. S., Hazen, E. L., Goldbogen, J. A., Stimpert, A. K., Calambokidis, J., & Southall, B. L. (2016). Prey-mediated behavioral responses of feeding blue whales in controlled sound exposure experiments. *Ecological Applications, 26*(4), 1075–1085.

Gearin, P. J., Melin, S. R., DeLong, R. L., Gosho, M. E., & Jeffries, S. J. (2017). *Migration Patterns of Adult Male California Sea Lions (Zalophus californianus)*. Retrieved from

Goldbogen, J. A., Southall, B. L., DeRuiter, S. L., Calambokidis, J., Friedlaender, A. S., Hazen, E. L., . . . Tyack, P. L. (2013). Blue whales respond to simulated mid-frequency military sonar. *Proceedings Biological Sciences, 280*(1765), 20130657. doi:10.1098/rspb.2013.0657

Harting, A. L., Baker, J. D., & Johanos, T. C. (2017). Estimating Population Size for Hawaiian Monk Seals Using Haulout Data. *The Journal of Wildlife Management, 81*(7), 1202–1209.

Lesage, V., Omrane, A., Daniol-Valcroze, T., & Mosnier, A. (2017). Increased proximity of vessels reduces feeding opportunities of blue whales in the St. Lawrence Estuary, Canada. *Endangered Species Research, 32*, 351–361. doi:doi.org/10.3354/esr00825

Lomac-MacNair, K., & Smultea, M. A. (2016). Blue Whale (*Balaenoptera musculus*) Behavior and Group Dynamics as Observed from an Aircraft off Southern California. *Animal Behavior and Cognition, 3*(1), 1–21. doi:10.12966/abc.02.01.2016

Lowry, M. S., Condit, R., Hatfield, B., Allen, S. G., Berger, R., Morris, P. A., . . . Reiter, J. (2014). Abundance, distribution, and population growth of the northern elephant seal (*Mirounga angustirostris*) in the United States from 1991 to 2010. *Aquatic Mammals, 40*(1), 20–31. doi:10.1578/am.40.1.2014.20

Lowry, M. S., & Forney, K. A. (2005). Abundance and distribution of California sea lions (*Zalophus californianus*) in central and northern California during 1998 and summer 1999. *Fishery Bulletin, 103*(2), 331–343.

Lowry, M. S., Nehasil, S. E., & Jaime, E. M. (2017). *Distribution of California Sea Lions, Northern Elephant Seals, Pacific Harbor Seals, and Steller Sea Lions at the Channel Islands During July 2011–2015*. Retrieved from Springfield, VA:

Mate, B. R., Palacios, D. M., Baker, C. S., Lagerquist, B. A., Irvine, L. M., Follett, T., . . . Winsor, M. H. (2016). *Baleen (Blue and Fin) Whale Tagging in Southern California in Support of Marine Mammal Monitoring Across Multiple Navy Training Areas. Final Report.* Retrieved from

Mate, B. R., Palacios, D. M., Irvine, L. M., Lagerquist, B. A., Follett, T., Winsor, M. H., & Hayslip, C. (2015). *Baleen (Blue & Fin) Whale Tagging in Southern California in Support of Marine Mammal Monitoring Across Multiple Navy Training Areas (SOCAL, NWTRC, GOA); Final Report*. Pearl Harbor, Hawaii: U.S. Pacific Fleet.

Melcón, M. L., Cummins, A. J., Kerosky, S. M., Roche, L. K., Wiggins, S. M., & Hildebrand, J. A. (2012). Blue Whales Respond to Anthropogenic Noise. *PLoS ONE, 7*(2). doi:10.1371/journal.pone.0032681

Moore, J. E., & Barlow, J. P. (2013). Declining abundance of beaked whales (Family Ziphiidae) in the California Current Large Marine Ecosystem. *PLoS ONE, 8*(1), e52770. doi:10.1371/journal.pone.0052770

Norris, T. (2017, August 18, 2017). [Updated abundance estimate for Guadalupe fur seals. Personal communication between Tenaya Norris (The Marine Mammal Center) and Michael Zickel (Mantech International) via email].

Norris, T., DeRango, G., DiGiovanni, R., & Field, C. (2015). Distribution of and threats to Guadalupe fur seals off the California coast. In. San Francisco, CA: Society of Marine Mammalogy.

Paniagua-Mendoza, A., Gendron, D., Romero-Vivas, E., & Hildebrand, J. A. (2017). Seasonal acoustic behavior of blue whales (*Balaenoptera musculus*) in the Gulf of California, Mexico. *Marine Mammal Science, 33*(1), 206–218. doi:10.1111/mms.12362

Racca, R., Austin, M., Rutenko, A., & Bröker, K. (2015). Monitoring the gray whale sound exposure mitigation zone and estimating acoustic transmission during a 4-D seismic survey, Sakhalin Island, Russia. *Endangered Species Research, 29*(2), 131–146. doi:10.3354/esr00703

Ream, R. R., Sterling, J. T., & Loughlin, T. R. (2005). Oceanographic features related to northern fur seal migratory movements. *Deep-Sea Research II, 52*, 823–843.

Redfern, J. V., Ferguson, M. C., Becker, E. A., Hyrenbach, K. D., Good, C., Barlow, J., . . . Werner, F. (2006). Techiques for cetacean-habitat modeling. *Marine Ecology Progress Series, 310*, 271–295.

Robinson, P. W., Costa, D. P., Crocker, D. E., Gallo-Reynoso, J. P., Champagne, C. D., Fowler, M. A., . . . Yoda, K. (2012). Foraging behavior and success of a mesopelagic predator in the northeast Pacific Ocean: Insights from a data-rich species, the northern elephant seal. *PLoS ONE, 7*(5), e36728. doi:10.1371/journal.pone.0036728

Roppel, A. Y. (1984). *Management of northern fur seals on the Pribilof Islands, Alaska, 1786–1981*: U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service.

Southall, B. L., Braun, R., Gulland, F. M. D., Heard, A. D., Baird, R. W., Wilkin, S. M., & Rowles, T. K. (2006). *Hawaiian Melon-headed Whales (Peponacephala electra) Mass Stranding Event of July 3–4, 2004*. Retrieved from

U.S. Department of the Navy. (2017a). *Criteria and Thresholds for U.S. Navy Acoustic and Explosive Effects Analysis (Phase III)*. San Diego, CA: Space and Naval Warfare System Command, Pacific.

U.S. Department of the Navy. (2017b). *U.S. Navy Marine Species Density Database Phase III for the Hawaii-Southern California Training and Testing Study Area*. Retrieved from Pearl Harbor, HI:

University of California Santa Cruz and National Marine Fisheries Service. (2016). *Unpublished California sea lion tracking data provided by Daniel Costa (University of California Santa Cruz)*.

Whitehead, H., & Jonsen, I. D. (2013). Inferring Animal Densities from Tracking Data Using Markov Chains. *PLoS ONE, 8*(4), e60901. doi:10.1371/journal.pone.0060901

Wilson, K., Littnan, C., & Read, A. J. (2017). Movements and home ranges of monk seals in the main Hawaiian Islands. *Marine Mammal Science, 33*(4), 1080–1096. doi:10.1111/mms.12429

Wright, A. J. (2015). Sound science: maintaining numerical and statistical standards in the pursuit of noise exposure criteria for marine mammals. *Frontiers in Marine Science, 2*(99), 1–6. doi:10.3389/fmars.2015.00099

Appendix I: Geographic Information System Data Sources

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Appendix I Geographic Information System Data Sources

Table I-1: Data Sources by Feature/Layer

Feature/Layer	Applicable Figures	Data Source References
HSTT Study Area	Multiple Figures (Global)	Training Areas - Commander, U.S. Fleet Forces - U.S. Navy, Common Operating Picture (COP) SOCAL/Hawaii. Updated 11/29/2017. SDSFIE Version 2.6. Navy POC: Jonathan Crain Jonathan.crain@navy.mil
Military Installation Areas	Multiple Figures (Global)	Defense Installation Spatial Data Infrastructure (DISDI) (2010). NOTE: California and Hawaii installations from Defense Installation Spatial Data Infrastructure (DISDI) IVT dataset. Naval Base Coronado installations extracted from a SANDAG land ownership dataset. NAVBASE San Diego created with combination of SANDAG and 2000 San Diego SID. Installation areas around Pearl Harbor received from the Department of the Navy in 2006.
Military Training/Range/Operation Areas	Multiple Figures (Global)	Training Areas - Commander, U.S. Fleet Forces - U.S. Navy, Common Operating Picture (COP) SOCAL/Hawaii. Updated 11/29/2017. SDSFIE Version 2.6. Navy POC: Jonathan Crain Jonathan.crain@navy.mil
Special Use Airspace	Multiple Figures (Global)	NGA Digital Aeronautical Flight Information File (DAFIF). (2017).
Transit Corridor	Multiple Figures (Global)	Research and Innovative Technology Administration's Bureau of Transportation Statistics (RITA/BTS) National Transportation Atlas Database. (2007). National Waterway Network. https://www.bts.gov/geospatial/national-transportation-atlas-database
General Ocean Bathymetry	Multiple Figures (Global)	National Geophysical Data Center (NGDC) NOAA. (2008). Global Digital Elevation Model (ETOPO2). https://www.ngdc.noaa.gov/mgg/global/relief/ETOPO2/
Detailed Ocean Bathymetry/Ocean Floor	Multiple Figures (Global)	NOAA National Centers for Environmental Information, U.S. Coastal Relief Model. (2016). http://www.ngdc.noaa.gov/mgg/coastal/crm.html
Large Marine Ecosystems	3.0-1, 3.0-2,3.64,3.6-22	NOAA-Fisheries, US LME Program, Narragansett Laboratory Kenneth.Sherman@NOAA.gov www.lme.noaa.gov
North Pacific Transition Zone	3.0-2	Department of the Navy. (2010). (Contract N624470-08-R-1008). Norfolk, VA: Department of the Navy, Naval Facilities Engineering Command, Atlantic. Prepared by Tetra Tech, Inc., Arlington, VA.
HSTT Open Ocean Focus Area	3.0-1, 3.0-2	Department of the Navy. (2010). (Contract N624470-08-R-1008). Norfolk, VA: Department of the Navy, Naval Facilities Engineering Command, Atlantic. Prepared by Tetra Tech, Inc., Arlington, VA.

Table I-1: Data Sources by Feature/Layer (continued)

Feature/Layer	Applicable Figures	Data Source References
Seamount Locations	3.0-4	Data Basin. (2004). Kitchingman, A. and S. Lai. 2004. "Inferences on potential seamount locations from mid-resolution bathymetric data." https://databasin.org/datasets/1c6af28887364008969f94c7e9df796e
SOCAL Ocean Currents	3.0-6	Department of Navy. (2008). SOCAL MRA
Upwelling Domain	3.0-6	Department of Navy. (2008). SOCAL MRA
Hawaii Ocean Currents	3.0-7	Department of Navy. (2005). Hawaii MRA
Sea Surface Temperature	3.0-8, 3.0-9	NOAA Optimum Interpolation (OI) Sea Surface Temperature (SST) V2. (2016). NCEP/NWS/NOAA. Climate Modeling Branch W/NP24http://www.esrl.noaa.gov/psd/data/gridded/data.noaa.oisst.v2.html#references
California Air Basins	3.2-1	California Air Resources Board. (2004). https://www.arb.ca.gov/ei/gislib/gislib.htm
Vessel Traffic Density	3.0-10	NOAA (2015). Vessel Traffic Data/Automatic Identification System (AIS) Data. http://marinecadastre.gov/ais/ ManTech (2015). Raw AIS data processed through ArcGIS 10.2 Spatial Analyst tools to create raster dataset.
San Diego Bay Eel Grass	3.3-8,3.5-2	Merkel and Associates. (2014).
Pearl Harbor Mangrove Removal Area	3.3-10	U.S. Department of the Navy. (2014). FY14 Chief of Naval Operations (CNO) environmental awards natural resources management – large installation Joint Base Pearl Harbor-Hickam: Joint Base Pearl Harbor Hickam.
Bottom Substrate Types SOCAL	3.5-5	TerraLogic GIS, and S. Copps. (2004).
Ocean Vegetation SSTC	3.5-10	Dataset received from Tierradata with no metadata. Dataset is likely from the San Diego Nearshore Mapping Program. POC: Tierradata (Rob Wolf; rob@tierradata.net).
Ocean Anchorages SSTC	3.5-10	ManTech. (2012). Digitized from NOAA Raster Nautical Chart 18772.
Ocean Substrate SSTC	3.5-10	Dataset received from Tierradata with no metadata. Dataset is likely from the San Diego Nearshore Mapping Program. POC: Tierradata (Rob Wolf; rob@tierradata.net).
Benthic Habitat Hawaii	3.5-11,3.5-13,3.5-14	Miles Anderson, Analytical Laboratories of Hawaii. (2007). Center for Coastal Monitoring and Assessment (CCMA), Biogeography Program POC: tim.battista@noaa.gov

Table I-1: Data Sources by Feature/Layer (continued)

Feature/Layer	Applicable Figures	Data Source References
Steelhead Critical Habitat	3.6-4,3.6-22	NOAA National Marine Fisheries Service. (2005). http://www.westcoast.fisheries.noaa.gov/maps_data/endangered_species_act_critical_habitat.html
Submerged Historic Properties	3.10-1, 3.10-2, 3.10-3, 3.10-4, 3.10-5	National Oceanic and Atmospheric Administration. (2015). Automated Wreck and Obstruction Avoidance database. [Web Page] Available from http://www.nauticalcharts.noaa.gov/hsd/wrecks_and_obstructions.html. Van Tilburg, Hans and James P. Delgado. (2017). The Unseen Landscape: Inventory and Assessment of Submerged Cultural Resources in Hawaii Camarillo, CA. California State Lands Shipwreck Database. (2012). Department of Navy (2005). SOCAL MRA
Ports	3.11-5,3.11-8	NGA. (2016). World Port Index. https://msi.nga.mil/NGAPortal/MSI.portal?_nfpb=true&_pageLabel=msi_portal_page_62&pubCode=0015
Shipping Routes	3.11-5,3.11-8	Research and Innovative Technology Administration's Bureau of Transportation Statistics (RITA/BTS) National Transportation Atlas Database. (2007). National Waterway Network. https://www.bts.gov/geospatial/national-transportation-atlas-database
Air Traffic Control Assigned Airspace (ATCAA)	3.11-11	KAYA (FIR), FACSFAC San Diego Instruction 3120.1G (ATCAA). (2013).
Dive Sites Hawaii	3.11-27,3.11-28,3.11-29,3.11-32	Department of the Navy. (2005). Dive Sites. Marine Resources Assessment for the Hawaiian Islands Operating Area. Naval Facilities Engineering Command, Pacific Division, Pearl Harbor, Hawaii. Contract N62470-02-D-9997, CTO 0026. Prepared by Geo-Marine, Inc., Plano, Texas.
Beaches Hawaii	3.11-27,3.11-28,3.11-29	USGS. Geographic Place Names from the USGS Geographic Names Information System (GNIS). https://geonames.usgs.gov/apex/f?p=138:1:0:::::
Park Locations Hawaii	3.11-27,3.11-28,3.11-29	USGS. Geographic Place Names from the USGS Geographic Names Information System (GNIS). https://geonames.usgs.gov/apex/f?p=138:1:0:::::
Park Areas	3.11-27,3.11-28,3.11-29	Tele Atlas North America, Inc./ESRI. (2008).
San Diego Bay Marinas	3.11-34	San Diego Department of Governments (SANDAG). (2013). https://www.sandag.org/index.asp?subclassid=100&fuseaction=home.subclasshome

Table I-1: Data Sources by Feature/Layer (continued)

Feature/Layer	Applicable Figures	Data Source References
National Wildlife Refuge Areas	3.11-34	San Diego Department of Governments (SANDAG) https://www.sandag.org/index.asp?subclassid=100&fuseaction=home.subclasshome; USFWS, Region 1, Division of Refuge Planning. (2013).
Fishing Locations SOCAL	3.11-34	San Clemente Island GPS Reference Points. The Fishing Network. http://fishingnetwork.net/index.php?pageid=sci
Depth Contour (Bathymetry)	3.11-34	NOAA National Centers for Environmental Information, U.S. Coastal Relief Model. (2016). http://www.ngdc.noaa.gov/mgg/coastal/crm.html

Notes: NGA = National Geospatial-Intelligence Agency, NOAA = National Oceanic and Atmospheric Administration, U.S. = United States, USGS = United States Geological Society, AWOIS = Automated Wreck and Obstruction Information System, NRHP = National Register of Historic Places, nm = nautical miles, OCS = Office of Coast Survey, SOCAL = Southern California

Appendix J: Agency Correspondence

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APPENDIX J AGENCY CORRESPONDENCE

Appendix J contains the correspondence between the Navy and federal or state agencies with respect to cooperating agency status (Section J.1), the Coastal Zone Management Act (Section J.2), the Endangered Species Act (Section J.3), the Magnuson-Stevens Fishery Conservation and Management Act (Section J.4), the Marine Mammal Protection Act (Section J.5), and the National Historic Preservation Act (Section J.6).

J.1 COOPERATING AGENCY STATUS

DEPARTMENT OF THE NAVY
OFFICE OF THE CHIEF OF NAVAL OPERATIONS
2000 NAVY PENTAGON
WASHINGTON, DC 20350-2000

5090
Ser N45/15U132463
December 18, 2015

Ms. Donna S. Wieting
Director, Office of Protected Resources
National Marine Fisheries Service
1315 East West Highway
Silver Spring, MD 20910

Dear Ms. Wieting:

SUBJECT: COOPERATING AGENCY REQUEST FOR THE HAWAII-SOUTHERN CALIFORNIA TRAINING AND TESTING (HSTT) PHASE III ENVIRONMENTAL IMPACT STATEMENT/OVERSEAS ENVIRONMENTAL IMPACT STATEMENT (EIS/OEIS)

In accordance with the National Environmental Policy Act (NEPA) and Executive Order (EO) 12114, the Department of the Navy is initiating the preparation of an EIS/OEIS to evaluate the potential environmental effects associated with the continuation of military readiness activities, which consist of training as well as research, development, testing, and evaluation (RDT&E, hereinafter referred to as "testing") activities that include the use of active sonar and explosives around the Hawaiian Islands and off the coast of Southern California HSTT Study Area. Also included are continued activities at select harbors, ports, and a transit corridor between Hawaii and Southern California.

This HSTT EIS/OEIS represents the third phase (Phase III) of ongoing NEPA and EO 12114 compliance for continuing at-sea training and testing. It will evaluate military readiness activities from December 2018 into the reasonably foreseeable future and accommodate evolving mission requirements associated with force structure changes, including those resulting from the development, testing, and ultimate introduction of new platforms (vessels, aircraft, and weapon systems) into the fleet. This Phase III HSTT EIS/OEIS will also evaluate a No Action Alternative for Navy at-sea training and testing. The existing Marine Mammal Protection Act (MMPA) Final Rule and Letters of Authorization for HSTT will expire in December 2018. This Phase III EIS/OEIS will support further MMPA authorization and consultation requirements under the Endangered Species Act (ESA).

To complete the analysis required by the permitting and consultation processes pursuant to MMPA and ESA in an efficient and effective way, Navy believes that participation by the National Marine Fisheries Service (NMFS) is essential. Therefore, in accordance with the Council on Environmental Quality's (CEQ's) regulations implementing NEPA (specifically 40 CFR § 1501.6), and CEQ's 2002 guidance on cooperating agencies, Navy requests that NMFS participate as a cooperating agency for the development of the HSTT Phase III EIS/OEIS.

5090
Ser N45/15U132463
December 18, 2015

As the lead agency, Navy will be responsible for overseeing preparation of the EIS/OEIS that will include, but not be limited to, the following:

- Gathering the necessary background information, including the most up-to-date scientific research, and preparing the EIS/OEIS and the necessary permit applications associated with the proposed action;
- Working with NMFS personnel to determine the method of estimating potential effects to protected marine species, including threatened and endangered species;
- Determining the scope of the EIS/OEIS, including the alternatives evaluated;
- Circulating the NEPA document with the public, including any other interested parties;
- Scheduling and supervising meetings held in support of the NEPA process and compiling any comments received from the public; and
- Maintaining an administrative record and responding to any Freedom of Information Act requests relating to the EIS/OEIS.

Navy requests that NMFS, in its role as a cooperating agency, provide support as follows:

- Providing timely comments on working drafts of the EIS/OEIS documents. Navy requests that comments on draft EIS/OEIS documents be provided in accordance with approved project schedules and commenting protocols;
- Responding to Navy requests for information, in particular related to review of the acoustic effects analysis and evaluation of the effectiveness of protection and mitigation measures;
- Participating, as necessary, in public engagement hosted by the Navy for discussion of issues related to the EIS/OEIS, including public meetings;
- Adhering to the overall schedule as set forth by the Navy in coordination with NMFS;
- Preparing any NMFS-specific documents, such as a Record of Decision, required to support the NMFS decision-making process;
- Maintaining an administrative record and responding to any Freedom of Information Act requests relating to the EIS/OEIS; and
- Providing a formal, written response to this request.

2

5090
Ser N45/15U132463
December 18, 2015

Navy views NMFS participation as an important element to the successful completion of the environmental planning process for the HSTT Phase III EIS/OEIS.

My point of contact for this action is Ms. Dawn Roderique, (703) 695-5207, email: dawn.roderique@navy.mil.

Sincerely,

K. H. OHANNESSIAN
Deputy Director,
Energy and Environmental
Readiness Division (OPNAV N45)

Enclosure: 1. Notional schedule for HSTT Phase III EIS/OEIS, MMPA, and ESA documentation

Copy to:
COMPACFLT (N465)
COMFLTFORCOM (N465)

3

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Silver Spring, MD 20910

OCT 13 2016

Admiral Louis Cariello
Director,
Energy and Environmental Readiness Division
Department of the Navy
Office of the Chief of Naval Operations
2000 Navy Pentagon
Washington, DC 20350-2000

Dear Admiral Cariello,

Thank you for your letters requesting that the National Oceanic and Atmospheric Administration's National Marine Fisheries Service (NMFS) participate as a cooperating agency in the preparation of an Environmental Impact Statement (EIS)/Overseas Environmental Impact Statement (OEIS) to evaluate potential environmental effects of military readiness activities, which consist of training as well as research, development, testing, and evaluation activities conducted within the Hawaii-Southern California Training and Testing (HSTT) Study Area and the Atlantic Fleet Training and Testing (AFTT) Study Area. We reaffirm our support of the Navy's decision to prepare an EIS/OEIS for HSTT and AFTT and agree to be a cooperating agency, due, in part, to our responsibilities under section 101(a)(5)(A) of the Marine Mammal Protection Act and section 7 of the Endangered Species Act.

In response to your letters, NMFS staff will continue to, to the extent possible, provide support as follows:

- Provide timely comments on working drafts of the EIS/OEIS documents in accordance with approved project schedules and commenting protocols;
- Respond to Navy requests for information, in particular related to review of the acoustic effects analysis and evaluation of the effectiveness of protection and mitigation measures;
- Participate, as necessary, in public engagement hosted by the Navy for discussion of issues related to the EIS/OEIS, including public meetings;
- Adhere to the overall schedules as set forth by the Navy in coordination with NMFS;
- Prepare any NMFS-specific documents, such as a Record of Decision, required to support the NMFS decision-making process; and
- Maintain an administrative record and respond to any Freedom of Information Act requests relating to the EIS/OEIS.

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If you need any additional information, please contact Jolie Harrison, NMFS Office of Protected Resources, at (301) 427-8401.

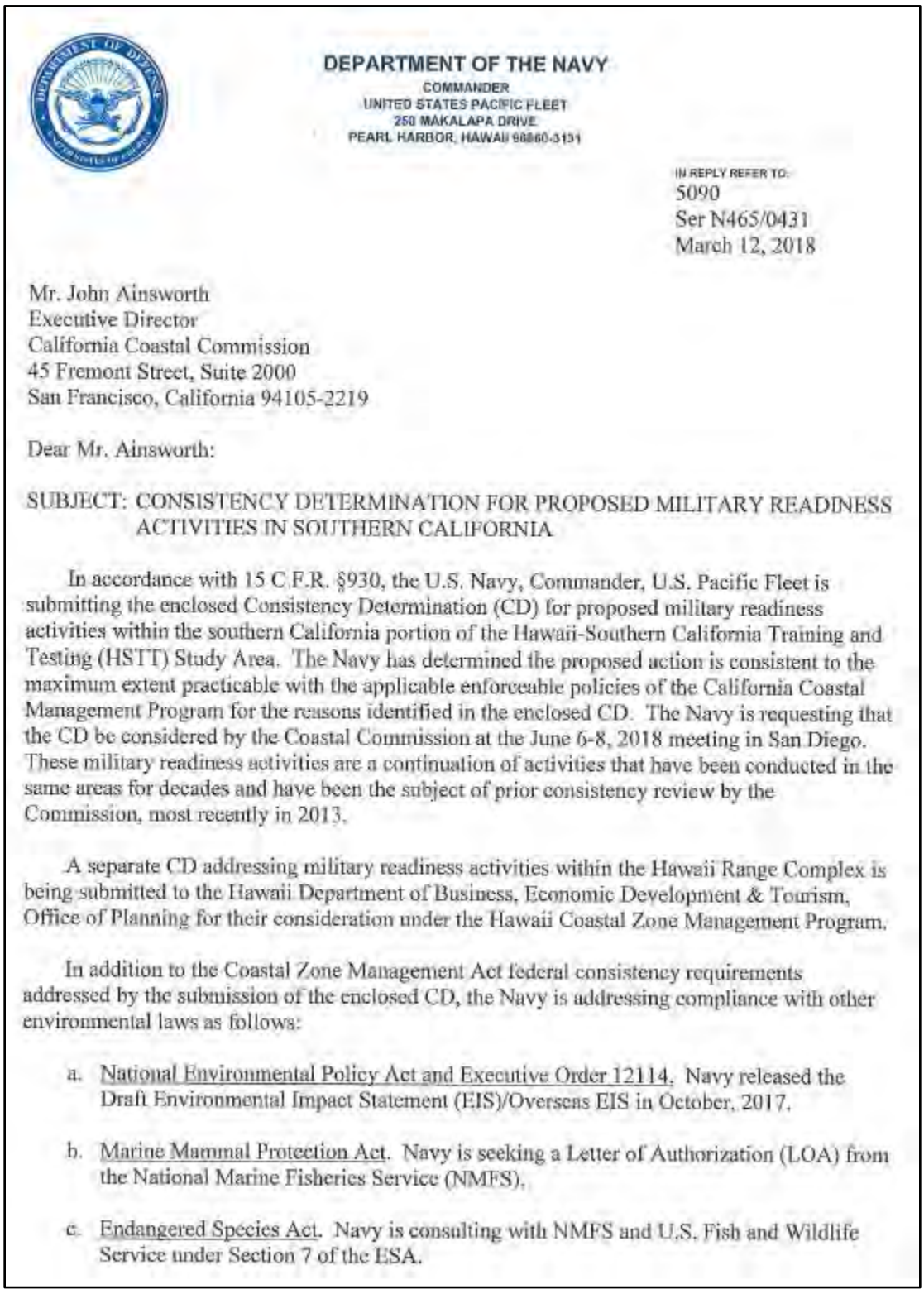
Sincerely,

Donna S. Wieting

Donna S. Wieting
Director, Office of Protected Resources

J.2 COASTAL ZONE MANAGEMENT ACT

J.2.1 CALIFORNIA



DEPARTMENT OF THE NAVY
COMMANDER
UNITED STATES PACIFIC FLEET
250 MAKALAPA DRIVE
PEARL HARBOR, HAWAII 96860-3131

IN REPLY REFER TO:
5090
Ser N465/0431
March 12, 2018

Mr. John Ainsworth
Executive Director
California Coastal Commission
45 Fremont Street, Suite 2000
San Francisco, California 94105-2219

Dear Mr. Ainsworth:

SUBJECT: CONSISTENCY DETERMINATION FOR PROPOSED MILITARY READINESS ACTIVITIES IN SOUTHERN CALIFORNIA

In accordance with 15 C.F.R. §930, the U.S. Navy, Commander, U.S. Pacific Fleet is submitting the enclosed Consistency Determination (CD) for proposed military readiness activities within the southern California portion of the Hawaii-Southern California Training and Testing (HSTT) Study Area. The Navy has determined the proposed action is consistent to the maximum extent practicable with the applicable enforceable policies of the California Coastal Management Program for the reasons identified in the enclosed CD. The Navy is requesting that the CD be considered by the Coastal Commission at the June 6-8, 2018 meeting in San Diego. These military readiness activities are a continuation of activities that have been conducted in the same areas for decades and have been the subject of prior consistency review by the Commission, most recently in 2013.

A separate CD addressing military readiness activities within the Hawaii Range Complex is being submitted to the Hawaii Department of Business, Economic Development & Tourism, Office of Planning for their consideration under the Hawaii Coastal Zone Management Program.

In addition to the Coastal Zone Management Act federal consistency requirements addressed by the submission of the enclosed CD, the Navy is addressing compliance with other environmental laws as follows:

a. National Environmental Policy Act and Executive Order 12114. Navy released the Draft Environmental Impact Statement (EIS)/Overseas EIS in October, 2017.

b. Marine Mammal Protection Act. Navy is seeking a Letter of Authorization (LOA) from the National Marine Fisheries Service (NMFS).

c. Endangered Species Act. Navy is consulting with NMFS and U.S. Fish and Wildlife Service under Section 7 of the ESA.

5090
Ser N465/0431
March 12, 2018

Information and reporting regarding on-going Navy training and testing activities in the study area, as well as Navy sponsored research and monitoring, is available at https://www.navymarinespeciesmonitoring.us/reporting/pacific/. The HSTT Draft EIS/OEIS and other supporting documents are available at https://hsttejs.com/.

If you have any questions please contact Mr. Alex Stone, U.S. Pacific Fleet, (619) 545-8128, Alexander.Stone@navy.mil or Ms. Deborah McKay, Commander Navy Region Southwest, at (619) 532-2284, Deborah.Mckay@navy.mil.

Sincerely,

L. M. FOSTER
By direction

Enclosure: CD for the southern California portion of the HSTT Study Area

Copy to:
Chief of Naval Operations (N454) (w/o enclosure)
Commander, Navy, Region Southwest (N40) (w/o enclosure)
John Nakagawa, Hawaii Department of Business, Economic Development & Tourism, Office of Planning (w/enclosure)

2

STATE OF CALIFORNIA—NATURAL RESOURCES AGENCY EDMUND G. BROWN, *GOVERNOR*

CALIFORNIA COASTAL COMMISSION

45 FREMONT STREET, SUITE 2000
SAN FRANCISCO, CA 94105-2219
VOICE AND TDD (415) 904-5200

June 8, 2018

L.M. Foster
Department of the Navy
Commander
United States Pacific Fleet
250 Makalapa Drive
Pearl Harbor, HA 96860-3131

Re: **CD-0001-18**, Department of the Navy, Consistency Determination, Military Readiness Activities in the Southern California portion of the Hawaii-Southern California Training and Testing (HSTT) Study Area

Dear Mr. Foster:

On June 6, 2018, by a unanimous vote, the California Coastal Commission objected to the above-referenced consistency determination submitted by the Navy for the California portion of its Hawaii-Southern California Training and Testing Program for 2019-2023. The Commission's objection was based on its conclusion that the activities as proposed were not consistent to the maximum extent practicable with the marine resource protection policy (Section 30230) of the California Coastal Act, which is one of the enforceable policies under the California Coastal Management Program (CCMP) (attached). The Commission considered the conditional concurrence recommended by staff, but concluded that the approach was unwarranted, given the lack of agreement by the Navy to implement the measures Commission staff had proposed to protect marine resources, as outlined in the June 23, 2018, Commission staff recommendation on the proposal, or the measures recommended in the letter to the Commission submitted by the Natural Resources Defense Council (NRDC), dated May 24, 2018.

The Commission also encouraged the Navy to continue working with the Commission and to consider the additional measures described in the two documents referred to in the previous paragraph (and attached), as well as any other relevant information, before concluding that less environmentally damaging alternatives are not available, or that additional protective measures are not implementable. The Commission also stressed its support for the Navy's mission and appreciation of the Navy's willingness to work productively with the Commission on resource protection matters of mutual importance.

Evidentiary support for the Commission's action is contained in the staff recommendation (available at the link on page 3 of this letter); however please note that this report was not adopted by the Commission. Although the grounds for the objection under the enforceable policies of the CCMP are contained in the Staff Recommendation, because the Commission's action differed procedurally from that recommended in the Staff Recommendation, and because the Commission was requesting the Navy to consider measures recommended by NRDC which

were not contained in the Staff Recommendation, formal adoption of "Revised Findings" will be necessary to reflect those differences. Adoption of proposed revised findings will be scheduled for the August 8-10, 2018, Commission meeting in Southern California.

The federal consistency regulations provide:

> *§ 930.43 State agency objection.*
>
> *(a) In the event the State agency objects to the Federal agency's consistency determination, the State agency shall accompany its response to the Federal agency with its reasons for the objection and supporting information. The State agency response shall describe:*
>
> *(1) How the proposed activity will be inconsistent with specific enforceable policies of the management program; and*
>
> *(2) The specific enforceable policies (including citations).*
>
> *(3) The State agency should also describe alternative measures (if they exist) which, if adopted by the Federal agency, would allow the activity to proceed in a manner consistent to the maximum extent practicable with the enforceable policies of the management program. Failure to describe alternatives does not affect the validity of the State agency's objection.*
>
> ...
>
> *(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.

If you have any questions, please feel free to call me at (415) 904-5289.

Sincerely,

MARK DELAPLAINE
Manager, Energy, Ocean Resources,
and Federal Consistency Division

Attachments:

(1) Coastal Act Section 30230
(2) CCC Staff Recommended Conditions
(3) Letter to CCC from NRDC (dated May 24, 2018)

Link to CCC Staff Recommendation and related documents:
https://www.coastal.ca.gov/meetings/agenda/#/2018/6

cc: Navy Region Southwest (Alex Stone, Suzanne Smith)
Office for Coastal Management (OCM) (David Kaiser, Kerry Kehoe)
NOAA Fisheries (Stephanie Egger)
Hawaii Coastal Management Program

Alex Stone, N01CE16
Environmental/Ranges
NASNI P.O. Box 357033
San Diego, CA 92135-7033

Deb McKay, AICP
Fleet Environmental NEPA & Coastal Coordinator
Navy Region Southwest N40
937 N Harbor Dr. Box 81
San Diego, CA 92132

David W. Kaiser
Senior Policy Analyst
Office of Ocean and Coastal Resource Management, NOAA
Coastal Response Research Center, University of New Hampshire
246 Gregg Hall, 35 Colovos Road
Durham, New Hampshire 03824-3534

Mr. Kerry Kehoe
Federal Consistency Specialist
Office of Ocean and Coastal Resource Management (N/ORM3)
NOAA National Ocean Service
1305 East West Hwy., Room 11321
Silver Spring, Maryland 20910-3281

Stephanie Egger
Office of Protected Resources
National Marine Fisheries Service
1315 East-West Highway
Silver Spring, MD 20910-3225

John Nakagawa, Justine Nihipali
Hawaii Coastal Zone Management Program
Office of Planning
P.O. Box 2359
Honolulu, HI 96804

-5-

Attachment 1

Coastal Act Section 30230

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.

CD-0001-18 (Navy)

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. MOTION AND RESOLUTION

Motion:

*I move that the Commission **conditionally concur** with consistency determination CD-0001-18 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-0001-18 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 a 2 km radius 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. The Navy will avoid exposing the following areas to high intensity active sonar and in-water explosives. 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). For in-water explosives, avoidance means prohibiting all in-water explosives for (a) and (b) below, and prohibit explosives categories Bins E-6 thru E-13[1] for (c) thru (f) below:

(a) the Channel Island National Marine Sanctuary (including around Santa Barbara Island);

[1] See Exhibit 13, last page, for descriptions of explosives bins.

CD-0001-18 (Navy)

(b) State and federal Marine Protected Areas (the offshore areas shown in red, light blue, and green in **Exhibit 5**);

(c) San Nicolas Basin fin whale and beaked whale high concentration area (the area shown in yellow in **Exhibit 5**);

(d) 1 km from shore (to protect coastal bottlenose dolphins);

(e) seasonally (June 1 – Oct. 31), all four blue whale areas sites designated as Biologically Important Areas (BIAs) (the areas shown in dark blue on **Exhibit 5**), and

(f) any future-NMFS-designated Biologically Important Area (BIA).

3. Night and low visibility conditions. Whenever the entire safety zone cannot be effectively monitored (e.g., due 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[2] reduction). If the latter, the Navy will use additional detection measures to enhance marine mammal observer capabilities, such as infrared (IR) or enhanced passive acoustic detection.

4. Vessel Speeds. Except where higher speeds are critical to military training needs, in the areas listed in Condition 2 (and during the time periods for the ones that are seasonal), vessel speeds shall normally not exceed 10 knots.

5. **Marine Mammal Observers.** The Navy will, to the maximum 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.

IV. 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:

[2] Decibel references in this report are underwater decibels (dB), described as decibels referenced to 1 micropascal, and usually shown as: dB re 1 µPa.



Via Electronic Mail

May 24, 2018

Chair Dayna Bochco and
Members of the California Coastal Commission
45 Fremont Street, Suite 2000
San Francisco, CA 94105-2219
Email: cteufel@coastal.ca.gov

Re: Consistency Review of Navy Activities off Southern California, 2019-2023

Dear Chair Bochco and Members of the Commission:

On behalf of the Natural Resources Defense Council, the California Coastal Protection Network, and our millions of members and activists, hundreds of thousands of whom reside in the State of California, we submit comments regarding the U.S. Navy's federal consistency determination for proposed activities off Southern California. For the reasons set forth below, we respectfully recommend that the Commission object to the Navy's consistency determination, as it did in 2013, when the Navy last came for consistency review. To the extent that the Commission also identifies measures that might allow it to reach concurrence, we ask it to include conditions, as described in these comments, that protect important habitat and provide other mitigation for the most vulnerable marine mammal populations.

As it did in 2008, the Navy's consistency determination, along with other documents it has prepared to satisfy federal law, details extraordinary harm to California's marine resources. **That harm includes over 2,500 cases of permanent hearing loss and other injury in marine mammals; more than 1 million instances of temporary hearing loss, a significant impact for species dependent on their hearing for survival and reproduction; and more than 10 million additional cases of disruption of vital behaviors, such as calving and foraging.** In total, the Navy estimates that its activities—including high-intensity sonar exercises and underwater detonations—will cause 11,773,470 takes of marine mammals.[1]

Numerous commentators, including the National Oceanic and Atmospheric Administration ("NOAA"), have observed that such impacts, when experienced repeatedly and at the

[1] U.S. Department of the Navy, *Draft Environmental Impact Statement/ Overseas Environmental Impact Statement for Hawaii-Southern California Training and Testing*, at App. E (2017) (Summation of estimated takes for Alternative 1 over the 5-year year period.)

NATURAL RESOURCES DEFENSE COUNCIL
1314 2ND STREET | SANTA MONICA, CA | 90401 | T 310.434.2300 | F 310.434.2399 | NRDC.ORG

geographic scale of populations, can readily accumulate to population-level harm.[2] Indeed, such harm from Navy activities has already been documented on the Navy's AUTEC range, in the Southern Bahamas, where repeated exposure to active sonar has apparently created a "population sink" for beaked whales, who remain in the region yet are generally unable to reproduce.[3]

Since the Commission last reviewed the Navy's activities for consistency with the California Coastal Act, new research has added to the already substantial concern over the Navy's impacts on the state's marine mammals and other coastal resources. For example, monitoring of Navy exercises has shown that "dipping" sonar, which is deployed via cable from manned and unmanned aircraft, impacts at least some whale species to a much greater extent than previously thought. Beaked whales have been found to exhibit strong reactions to these sudden, unpredictable exposures, ceasing to forage and fleeing for tens of miles, even though the duration of use and source levels of these systems are generally well below those of hull-mounted mid-frequency active sonar.[4] The new science also includes studies, using a variety of methods (satellite telemetry, photo-identification, and long-term acoustic monitoring), indicating the presence of small, resident populations of beaked whales—particularly vulnerable to disturbance—in the Southern California Bight.[5] Finally, a rapidly expanded body of scientific literature now indicates the significant impacts of noise on ocean species beyond marine mammals—including fish and marine invertebrates, many of which represent important prey species or are of commercial importance.[6]

---

[2] *E.g.*, Convention on Biological Diversity, *Scientific synthesis on the impacts of underwater noise on marine and coastal biodiversity and habitats* (UN Doc. UNEP/CBD/SBSTTA/16/INF/12) (2012); Gedamke, J., Harrison, J., Hatch, L., Angliss, R., Barlow, J., Berchok, C., Caldow, C., Castellote, M., Cholewiak, D., De Angelis, M.L., Dziak, R., Garland, E., Guan, S., Hastings, S., Holt, M., Laws, B., Mellinger, D., Moore, S., Moore, T.J., Oleson, E., Pearson-Meyer, J., Piniak, W., Redfern, J., Rowles, T., Scholik-Schlomer, A., Smith, A., Soldevilla, M., Stadler, J., Van Parijs, S., and Wahle, C., *Ocean Noise Strategy Roadmap* (2016).

[3] Claridge, D.E., *Population ecology of Blainville's beaked whales (*Mesoplodon densirostris*)* (Ph.D. thesis) (2013); New, L.F., Moretti, D.J., Hooker, S.K., Costa, D.P., Simmons, S.E., Using energetic models to investigate the survival and reproduction of beaked whales (family *Ziphiidae*), *PLoS ONE*, 8(7), e68725 (2013).

[4] Falcone, E. A., Schorr, G.S., Watwood, S.L., DeRuiter, S.L., Zerbini, A.N., Andrews, R.D., Morrissey, R.P., and Moretti, D.J., Diving behavior of Cuvier's beaked whales exposed to two types of military sonar, *Royal Society Open Science*, 4(8), 170629 (2017); Falcone, E., Schorr, G., Watwood, S., DeRuiter, S., Zerbini, A., Andrews, R., Morrissey, R., and Moretti, D., *Go long! Behavioral changes in satellite-tagged Cuvier's beaked whales exposed to two types of military mid-frequency active sonar,* Oral Presentation. Society of Marine Mammalogy Biennial Conference, Halifax, Canada, (23 Oct, 2017).

[5] Falcone, E., Schorr, G., Douglas, A., Calambokidis, J., Henderson, E., McKenna, M. F., Hildebrand, J., and Moretti, D., Sighting characteristics and photo-identification of Cuvier's beaked whales (*Ziphius cavirostris*) near San Clemente Island, California: A key area for beaked whales and the military? *Marine Biology*, 156, 2631–2640 (2009); Baumann-Pickering, S., Roch, M.A., Brownell Jr., R.L., Simonis, A.E., McDonald, M.A., Solsona-Berga, A., Oleson, E.M., Wiggins, S.M., and Hildebrand, J.A., Spatio-temporal patterns of beaked whale echolocation signals in the North Pacific, *PLoS ONE*, 9(1), e86072 (2014); Baumann-Pickering, S., Trickey, J.S., Roch, M.A., and Wiggins, S.M., Spatio-temporal distribution of beaked whales in southern California waters, *The Journal of the Acoustical Society of America*, 136(4), 2073 (2014); Baumann-Pickering, S., Hildebrand, J.A., Yack, T., and Moore, J.E. *Modeling of Habitat and Foraging Behavior of Beaked Whales in the Southern California Bight*, Scripps Institution of Oceanography, University of California, San Diego La Jolla United States, (30 Sep, 2015); Falcone, E.A. and Schorr, G.S., *Distribution and demographics of marine mammals in SOCAL through photo-identification, genetics, and satellite telemetry*, Report prepared for CNO (45) under NPS Grant N00244-10-1-0050, pp. 75 (2014); Schorr, G.S., Falcone, E.A., Moretti, D.J. and Andrews, R.D., First long-term behavioral records from Cuvier's beaked whales (Ziphius cavirostris) reveal record-breaking dives, *PLoS ONE*, 9(3), e92633 (2014).

[6] *E.g.*, Solé, M., Lenoir, M., Durfort, M., López-Bejar, M., Lombarte, A., and André, M., Ultrastructural Damage of Loligo vulgaris and Illex coindetii statocysts after Low Frequency Sound Exposure, *PLoS ONE*, 8(10), 1–12 (2013); Solé, M., Lenoir,

At the same time, the amount of sonar and explosives activity represented in the Navy's consistency determination remains enormous. While the Navy proposes to conduct fewer hours of training with hull-mounted, mid-frequency active sonar training than it did during its previous five-year review—apparently the result of a more accurate measurement of sonar activity rather than of any environmental or operational change (*see* Consistency Determination at 2-8, 2-9)—training with this sonar type still amounts to as many as 6,701 hours per year, or 28,808 hours of sonar use distributed over five years. Moreover, proposed levels of other harmful activities remain extremely high, representing an enormous concentration of activity off California's coast. These include 67,819 detonations of underwater explosives, 15,064 hours of low-frequency active sonar use, and 130,994 hours of training and testing with mid-frequency active sonar deployed by helicopters and other sources. Among the latter, these "dipping" sonars are the ones that, according to recent studies, have far wider impacts on beaked whales off Southern California than was previously supposed.

It is therefore paramount that the Navy take strong measures to mitigate or significantly reduce the level of impact of its activities. **Unfortunately, the Navy—rather than consider additional mitigation measures for its Southern California range, in line with current science—has proposed withdrawing measures that it has applied on the range for almost three years.**

I. The Navy's Proposed Roll-Back of Current Mitigation Measures

As you know, the California Coastal Act mandates that "[m]arine resources shall be maintained, enhanced, and where feasible, restored." Pub. Res. Code § 30230 (emphasis added). Under the Act, "[s]pecial protection shall be given to areas and species of special biological or economic significance, and "[u]ses 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." *Id.* Simply put, the Navy's activities are not consistent to the maximum extent practicable with these standards.

There is strong consensus—at NOAA and in the scientific community—that avoidance of high-value habitat represents the best available means to reduce the impacts of mid-frequency active sonar and certain other types of ocean noise on marine biota.[7] Indeed, in a 2010 memorandum

---

M. Durfort, M. López-Bejar, M., Lombarte, A., Van Der Schaar, M., and André, M., Does exposure to noise from human activities compromise sensory information from cephalopod statocysts? *Deep-Sea Research Part II: Topical Studies in Oceanography*, 95, 160–181 (2013); Sierra-Flores, R., Atack, T., Migaud, H., and Davie, A., Stress response to anthropogenic noise in Atlantic cod Gadus morhua L., *Aquacultural Engineering*, 67, 67–76, (2015); Simpson, S.D., Purser, J., and Radford, A.N., Anthropogenic noise compromises antipredator behaviour in European eels, *Global Change Biology*, 21(2), 586–593, (2015); Day, R.D., McCauley, RD., Fitzgibbon, Q.P., Hartmann, K., and Semmens, J.M., Exposure to seismic air gun signals causes physiological harm and alters behavior in the scallop Pecten fumatus, *PNAS*, 114, E8537-E8546 (2017); McCauley, R. D., Day, R.D., Swadling, K.M., Fitzgibbon, Q.P., Watson, R.A., and Semmens, J.M., Widely used marine seismic survey air gun operations negatively impact zooplankton, *Nature Ecology & Evolution*, 1, 0195, (2017).

[7] *See, e.g.*, Hatch, L.T., Wahle, C.M., Gedamke, J., Harrison, J., Laws, B., Moore, S.E., Stadler, J.H., and van Parijs, S.M., Can you hear me here? Managing acoustic habitat in U.S. waters, *Endangered Species Research* 30: 171-186 (2016).

from Dr. Jane Lubchenco to the White House Council on Environmental Quality, NOAA recognized the need to improve its Navy mitigation and asserted the importance of time-area restrictions in biologically sensitive areas.[8] Consistent with this priority, NOAA has since made habitat protection a leading element of its Ocean Noise Strategy, an effort coordinated across the agency's various offices and departments to address the cumulative effects of ocean noise on marine wildlife.[9]

Accordingly, following a 2015 federal court ruling that found that the Navy and NOAA had violated multiple provisions of three environmental laws, the agencies voluntarily entered into a settlement agreement that imposed time and area restrictions on Navy activities off Southern California, as well as around the Hawaiian Islands. *Conservation Council for Hawai'i v. National Marine Fisheries Serv. and NRDC v. National Marine Fisheries Serv.*, 97 F. Supp. 3d 1210 (D. Haw. 2015) [hereinafter *Conservation Council*].[10] The areas protected were identified as biologically important to a number of marine mammal populations: blue whales and fin whales, both endangered species for which Southern California represents highly important seasonal habitat; gray whales, which migrate as a species along the California coast; and beaked whales, a family of deep-diving marine mammals whose extreme sensitivity to Navy sonar is well recognized from a long history of associated strandings.

Under the settlement agreement, which was incorporated into a judicial order by the parties' consent, the Navy agreed to exclude certain types of sonar activities, as well as activities involving underwater explosives, from important habitat; and to undertake measures to reduce ship-strikes of baleen whales.[11] In doing so, the Navy validated the feasibility of adopting time/area restrictions to reduce adverse impacts on marine mammals.

The proposal set forth in the Navy's consistency determination significantly rolls back the protections put in place under the terms of the settlement agreement. The weakening of these protections is cause for concern, as is the Navy's failure to consider additional protections in light of new science. In sum, the Navy:

- Eliminates refuges for small populations of Cuvier's beaked whales off Southern California. This is highly concerning as beaked whales have proven to be one of the most sensitive marine mammal species to mid-frequency active sonar and are at direct risk of mortality. Moreover, repeated exposure of these small, resident populations to harmful activities is likely to result in population-level impacts. Best available science indicates that the primary habitat of a small, resident population of Cuvier's beaked whales overlaps with the Southern California Anti-Submarine Warfare Range (SOAR) off San Clemente

[8] Memorandum from Dr. Jane Lubchenco, NOAA Administrator, to Ms. Nancy Sutley, CEQ Chair (Jan. 19, 2010).

[9] Gedamke, J., *et al.*, Ocean Noise Strategy Roadmap, *supra*.

[10] We have included a summary of the Court's findings as Attachment A.

[11] Stipulated Settlement Agreement and Order, *Conservation Council*, 97 F. Supp. 3d 1210 (D. Haw. 2015) (issued Sept. 14, 2015).

Island, a smaller site within the Navy's larger range, and is continually impacted by the Navy's training and testing activities.[12]

- Ends protective measures for endangered blue whales related to sonar use and vessel collisions. Under the terms of the settlement agreement, the Navy was required to prohibit hull-mounted mid-frequency sonar and limit explosives for training and testing activities from June 1 to October 31 within two "Settlement Areas" located within the San Diego Planning Awareness and Cautionary Areas. Pursuant to its consistency determination, the Navy intends to remove this prohibition and carry out up to three major training exercises per season that deploy hull-mounted active sonar. Consistency Determination at C-45. The Navy also eliminates measures to minimize the risk of vessel collision from a high risk area southwest of SOAR, in the vicinity of the Tanner Bank Minefield. These actions may have population-level consequences for blue whales.

- Under-protects endangered fin whales from vessel collisions. The Navy proposes vessel collision awareness measures for fin whales within an area that extends from the California mainland out to 20 nautical miles offshore, from November 1 through May 31. This area does not, in fact, protect habitat of known higher relative importance for fin whales, which, according to NOAA's mapping of biologically important areas for cetaceans, generally comprises the waters between the 200 meter and 1000 meter isobaths, and particular areas of importance near Tanner and Cortez Bank, the San Clemente Basin, and the shelf edge west of San Nicolas Island.[13]

- Fails to extend mitigation measures to air-deployed mid-frequency active sonar (or "dipping sonar"). Due to it being deployed at depth and in an unpredictable pattern, dipping sonar has been shown to have a disproportionate level of impact on marine mammals, and specifically beaked whales, for which it has been shown to disrupt foraging activity.[14] For small, resident populations of beaked whales, these impacts have the potential to result in population-level consequences.

- Fails to extend mitigation to high-density beaked whale habitat south of the Channel Islands. Considering the sensitivity of beaked whales to mid-frequency active sonar and the potential for harm to occur at the population-level, it is imperative that the Navy extend mitigation measures to all areas identified as important habitat for beaked whales. According to Navy-sponsored research, these areas include the Northern Catalina Basin and San Clemente

[12] *E.g.*, DeRuiter, S.L., Southall, B.L., Calambokidis, J., Zimmer, W.M., Sadykova, D., Falcone, E.A., Friedlaender, A.S., Joseph, J.E., Moretti, D., Schorr, G.S. and Thomas, L., First direct measurements of behavioural responses by Cuvier's beaked whales to mid-frequency active sonar, *Biology Letters*, 9(4): p.20130223 (2013); Falcone, E. A., et al.., Diving behavior of Cuvier's beaked whales exposed to two types of military sonar, *supra*.

[13] Calambokidis, J., Steiger, G.H., Curtice, C., Harrison, J., Ferguson, M., Becker, E., DeAngelis, M., and Van Parijs, S.M., Biologically Important Areas for selected cetaceans within U.S. waters – West coast region, *Aquatic Mammals* (Special Issue) 41(1): 39-53 (2015).

[14] Falcone, E., *et al.*, Diving behavior of Cuvier's beaked whales exposed to two types of military sonar, *supra*.

Basin, and the southernmost edge of the California Current, west of Tanner and Cortez Banks, in addition to areas further north.[15]

The Navy has not proposed to protect coastal resources to the maximum extent practicable, as required under the CZMA.

II. Information Necessary for Consistency Review

Under the Coastal Zone Management Act, the Commission can object to a consistency determination based on lack of sufficient information. Here the Navy has failed to provide basic information and analysis critical to the Commission's consistency review. To cite only a few examples:

- Estimates of impacts on Cuvier's beaked whale populations. The Navy's estimates of harm, or "take," for Cuvier's beaked whales (11,426 individual takes [training: 6965; testing: 4,461] for all sources)[16] are presented by the Navy as a single estimate for the California/ Oregon/ Washington stock. This is deeply problematic as the species is known to occur in small, resident populations within the Southern California Range Complex. These populations are acutely vulnerable to Navy sonar. Cuvier's beaked whales have repeatedly been associated with sonar-related pathology, is known to react strongly to sonar at distances up to 100 kilometers, and is universally regarded to be among the most sensitive of all marine mammals to anthropogenic noise.[17] Some populations, such as the one in San Nicholas Basin that coincides with the Navy's much-used Southern California ASW Range (SOAR), are repeatedly exposed to sonar, posing the same risk of population-wide harm documented on a Navy range in the Bahamas.[18] The broad take estimates provided by the Navy provide no insight into the specific impacts proposed for these small populations.

- Data supporting the Navy's claims of the effectiveness of its mitigation measures. The Navy makes a *post hoc* adjustment to its take estimates for injury and mortality based on "mitigation effectiveness." Unfortunately, neither the Commission nor the public has any meaningful way to evaluate the Navy's adjustment further, since the Navy does not provide the scores used to generate its effectiveness factor or provide pre-adjustment take numbers. This is the case even though most Navy activities would be allowed to occur in all sea conditions and hours of the day, making it highly unlikely that Navy visual surveys could approximate the sighting effectiveness of a large-vessel abundance survey. Moreover, Navy

[15] Baumann-Pickering, S., *et al. Modeling of Habitat and Foraging Behavior of Beaked Whales in the Southern California Bight*, *supra*.

[16] Personal communication from M. Delaplaine, California Coastal Commission, to M. Jasny, NRDC (May 23, 2018).

[17] *See, e.g.*, Falcone, E., *et al.*, Diving behavior of Cuvier's beaked whales exposed to two types of military sonar, *supra*; Fernández, A., Edwards, J.F., Rodríguez, F., Espinosa de los Monteros, A., Herráez, P., Castro, P., Jaber, J.R., Martin, V., and Arbelo, M., 'Gas and fat embolic syndrome' involving a mass stranding of beaked whales (Family *Ziphiidae*) exposed to anthropogenic sonar signals, *Veterinary Pathology* 42: 446–57 (2005).

[18] Falcone, E.A. and Schorr, G.S., *Distribution and demographics of marine mammals in SOCAL through photo-identification, genetics, and satellite telemetry, supra*; Claridge, D.E., *Population ecology of Blainville's beaked whales (*Mesoplodon densirostris), *supra*.

watchstanders charged with implementing the Navy's exclusion zones appear to fare much poorer in detecting marine mammals than do ordinary trained observers, who are generally not allowed aboard ship.[19] The Navy provides no data supporting its claims of effectiveness even though they significantly reduce its estimates of permanent injury and, especially, mortality from the levels anticipated in 2013, when it last came before the Commission on consistency review.[20]

- Locations of exercises and impacts. Unfortunately, while it provides more locational information than it did in previous consistency reviews, the Navy still fails to indicate, beyond (in some cases) its broad operations areas, where activities will occur within the Southern California Range Complex—an area roughly the size of the entire state of California—and where marine mammal injuries will take place within this expansive facility. *See* Consistency Determination at Appendix A, Tables A-1 to A-4. Nor does it break down its take numbers by activity type, other than by distinguishing between the broad categories of training and testing. *See id.* at Appendix E. Thus, there is no way to surmise, for example, which Navy action is responsible for the greatest harm to marine species. It is similarly impossible to evaluate whether the anticipated marine mammal injuries, foraging losses, and other impacts are concentrated either spatially or temporally.

- Analysis of population-level impacts. As with past analyses, the present DEIS tabulates exposures and takes of marine mammal species, then concludes, summarily, that estimated impacts will not harm resources at a population level. On the contrary, it assumes, without explanation, that the accumulated annual mortalities, injuries, energetic costs, temporary losses of hearing, chronic stress, and other impacts would not affect vital rates in individuals or populations, even though the Navy's activities would affect the same populations over time. Notably, this lack of analysis falls far short of the EIR prepared, in 2012, for PG&E's proposed Central Coastal California Seismic Imaging Project ("CCCSIP"), which used proxies to estimate population effects. If the Navy conducted a similar analysis here—adjusting for the fact that the proposed CCCSIP was a one-time activity, while the Navy's activities take place year after year indefinitely—we believe it would be likely to show that the impacts from its activities are significant at a population level.[21]

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[19] *See, e.g.*, Watwood, S., Rider, S., Richlen, M., and Jefferson, T., *Cruise report: Marine species monitoring & lookout effectiveness study*, Submarine Commanders Course, February 2015, Hawaii Range Complex (2016) (prepared under Navy contract).

[20] Similarly, the Navy provides no data supporting its claim, made throughout its Consistency Determination, that 95 percent of marine mammals will effectively avoid permanent injury and mortality by fleeing the impact area. On the contrary, it is well established that marine mammals may remain in important habitat, and the most vulnerable individuals may linger in an area, notwithstanding the risk of harm. Furthermore, marine mammals cannot necessarily predict where an exercise will travel, and Navy vessels engaged in certain activities may move more rapidly than a marine mammal that is attempting to evacuate. Again, the Navy's assumptions, while unsupported by data, result in significant reductions in estimated numbers of mortalities and permanent injuries.

[21] *See* State Lands Commission, *Central Coastal California Seismic Imaging Project Environmental Impact Report*, Appendix H: Marine Mammal Technical Report (2012). For example, the Diablo Canyon EIR found a "high magnitude" of impact where at least 2.5% of an endangered species or population, or 25% of a non-endangered species or population, were estimated to suffer non-injurious take. It seems highly likely, based on its own take estimates, that the Navy's activities would exceed this threshold for several Southern California marine mammal species. In any case, the Navy has not undertaken or submitted an analysis of population-level impacts.

Finally, in light of the Navy's failure to provide sufficient information, we want to make the Commission aware of a current Navy effort, on Capitol Hill, to weaken the provisions of the Marine Mammal Protection Act. If the Navy's proposal passes, the Act would no longer require the Navy, and other branches of the Defense Department, to periodically undergo environmental review and permitting for the harm its training activities cause marine mammals. Instead, the permits the Navy receives under the Act could last indefinitely, undermining a process that is intended to ensure continued oversight over uniquely vulnerable species. Moreover, since it is the Act's permitting process that triggers the Commission's consistency review of Navy activities, the Navy's bid to amend the Marine Mammal Protection Act could suppress Commission review in the future.

III. Recommendation and Proposed Mitigation

Again, we respectfully recommend that the Commission object to the Navy's consistency determination as inconsistent with the state's Coastal Zone Management Program. To the extent that the Commission also identifies measures that might allow it to reach concurrence, however, we recommend that it include the following conditions, which are aimed at protecting the most vulnerable marine mammal populations in the Southern California region. These conditions differ from some of those we have recommended previously, reflecting advances in our knowledge of marine mammal distribution and habitat use off Southern California, the mitigation measures established through the *Conservation Council* litigation, and new developments in the science of ocean noise impacts.

1. Protection of important habitat for beaked whales. The Navy will prohibit the use of hull-mounted, mid-frequency active sonar deployed on Navy surface vessels, of mid-frequency active sonar deployed from helicopters and fixed-wing aircraft, and of in-water explosives, for training and testing activities, in the beaked whale habitat areas east of San Nicholas Island and west of Santa Catalina Island, defined as "Figure A, "Figure B," and "Figure D" in Map 1.[22]

   Rationale: The three areas collectively represent "refuges" for two highly vulnerable populations of beaked whales, a family of deep-diving whales that are, as we noted above, among the most sensitive of marine mammals to anthropogenic noise.

   Satellite telemetry data and eight years of photo-identification and mark-recapture data indicate that the San Nicholas Basin represents an area of high site fidelity, and possible residency, for a small population of Cuvier's beaked whales associated with San Clemente Island.[23] Data also indicate that the population is relatively small, with abundance estimated at 235 individuals, with a sex ratio skewed towards adult females,

[22] The maps cited in this section appear under Attachment B to this letter.

[23] Falcone, E., *et al.*, Sighting characteristics and photo-identification of Cuvier's beaked whales (*Ziphius cavirostris*) near San Clemente Island, California: A key area for beaked whales and the military? *supra*; Falcone, E.A. and Schorr, G.S., *Distribution and demographics of marine mammals in SOCAL through photo-identification, genetics, and satellite telemetry*, *supra*; Schorr, G.S., et al., First long-term behavioral records from Cuvier's beaked whales (Ziphius cavirostris) reveal record-breaking dives, *supra*.

including individuals with calves.[24] Eight Cuvier's beaked whales tagged off the Southern California coast for periods of up to three months were present within the San Nicholas Basin on 53% of the days transmitted; one individual occurred inside the San Nicholas Basin on 74% of days over three months the tag was active.[25] The area marked "Figures A" in Map 1 constitutes a "refuge" from sonar and explosives activities in a portion of the whales' secondary habitat, northwest of the instrumented Southern California ASW Range, which the Navy has implemented since September 2015 as part of the *Conservation Council* Settlement Agreement but did not include in its Consistency Determination. "Figure D" is an extension of that refuge area.

It is likely that a small, resident population of Cuvier's beaked whales also resides in the neighboring Santa Catalina Basin, to the east. Satellite telemetry data show that whales have a high degree of site fidelity to the Santa Catalina Basin, with little evidence of movement to the San Nicholas Basin, despite its close proximity—a distribution that is consistent with demographic isolation.[26] Similar to the approach taken for the San Nicholas population, Figure "B" in Map 1 establishes a refuge from sonar and explosives activities in the northern portion of the Santa Catalina Basin, which the Navy has implemented in accordance with *Conservation Council* but did not include in its Consistency Determination.

2. Protection of important habitat for blue whales.

(A) The Navy will prohibit the use of hull-mounted, mid-frequency active sonar deployed on Navy surface vessels, with the exception of system checks; of mid-frequency active sonar deployed from helicopters and fixed-wing aircraft; and of in-water explosives, for training and testing activities, within the San Diego Arc Planning Awareness and Cautionary Areas, defined in the Navy's Consistency Determination at Fig. 2-10, from June 1 through December 31 (reproduced as Map 2). With respect to system checks (i.e., the non-tactical use of mid-frequency sonar for pre-operational testing, preventive or corrective maintenance, or during inspections by the Board of Inspection and Survey), the Navy will advise Commanding Officers that the area is blue whale habitat and that they should avoid conducting system checks within the area whenever practicable.

(B) The Navy will observe a 10-knot speed restriction during transits of vessels, and notify all vessels to operate with increased awareness and additional vigilance, within the following seasonally important habitat areas, from June 1 through December 31: (1) the San Diego Arc Planning Awareness and Cautionary Areas defined in the Navy's Consistency Determination at Fig. 2-10, and (2) blue whale habitat at Tanner-Cortex Bank, defined as Figure "C" in Map 1.

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[24] Falcone, E.A. and Schorr, G.S. (2014). *Distribution and demographics of marine mammals in SOCAL through photo-identification, genetics, and satellite telemetry, supra*

[25] Schorr, G.S., *et al.* (2014). First long-term behavioral records from Cuvier's beaked whales (*Ziphius cavirostris*) reveal record-breaking dives, *supra.*

[26] Falcone, E.A. and Schorr, G.S. (2014). *Distribution and demographics of marine mammals in SOCAL through photo-identification, genetics, and satellite telemetry, supra.*

Rationale: This condition provides protection for endangered blue whales, which each year come to Southern California to feed, in some of the highest numbers for this species seen anywhere on the planet. Blue whales are highly vulnerable to both acoustic disturbance from sonar and vessel collision.

Multiple studies have now demonstrated significant changes in blue whale foraging behavior, seen repeatedly in response to controlled exposures using simulated mid-frequency active sonar.[27] If acoustic disturbance causes a cessation of deep-feeding or displacement to lower density prey patches, the energy efficiency of the individuals will decrease.[28] As deep-feeding blue whales are most likely to be affected by sound exposure, repeated behavioral responses to military sonar could have significant cumulative impacts.[29] In particular, disruption to foraging behavior or nursing of calves may result in an energetic net loss for the individual whale,[30] with possible ramifications on health and fitness, as well as calf survival.[31]

In addition, ship strikes are one of the primary anthropogenic factors impeding the recovery of blue whales. The most conservative model estimates that annual mortality from ship strikes, off the west coast, runs 7.8 times higher than the number that NOAA states this endangered species can tolerate.[32]

The San Diego Arc Planning and Cautionary Areas, and the area at Tanner-Cortez Bank identified as "Figure C" on Map 1, correspond to Biologically Important Areas for blue whales that NOAA identified as part of a systematic, multi-year effort to prioritize

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[27] Goldbogen, J.A., Southall, B. L., DeRuiter, S. L., Calambokidis, J., Friedlaender, A. S., Hazen, E. L., Falcone, E. A., Schorr, G. S., Douglas, A., Moretti, D. J., Hyburg, C., McKenna, M. F., and Tyack, P. L., Blue whales respond to simulated mid-frequency military sonar, *Proceedings of the Royal Society B: Biological Sciences*, 280, 20130657 (2013); Friedlaender, A. S., Hazen, E. L., Goldbogen, J. A., Stumpert, A. K., Calambokidis, J., and Southall, B. L., Prey-mediated behavioral responses of feeding blue whales in controlled sound exposure experiments, *Ecological Applications*, 26(4), 1075-1085 (2016).

[28] Goldbogen, J. A., Calambokidis, J., Oleson E., Potvin, J., Pyenson, N. D., Schorr, G., and Shadwick, R. E., Mechanics, hydrodynamics and energetics of blue whale lunge feeding: efficiency dependence on krill density, *The Journal of Experimental Biology*, 214(1), 131-146 (2011).

[29] Friedlaender, A. S., et al., (2016). Prey-mediated behavioral responses of feeding blue whales in controlled sound exposure experiments, *supra*.

[30] Lockyer, C., *Growth and energy budgets of large baleen whales from Southern Hemisphere*. In J. G. Clark (Ed.) *FAO fisheries series 5: Mammals in the seas. Vol 3: General papers and large cetaceans* (pp. 379-487). Rome: Food and Agriculture Organization of the United Nations (1981); Goldbogen, J. A., *et al*., Mechanics, hydrodynamics and energetics of blue whale lunge feeding: efficiency dependence on krill density, *supra*.; Smultea, M. A., Fertl, D., Bacon, C. E., Moore, M. R., James, V. R., and Wursig, B., Cetacean mother-calf behavior observed from a small aircraft off Southern California, *Animal Behavior and Cognition*, 4(1), 1-23 (2017).

[31] Weidenmann, J., Cresswell, K. A., Goldbogen, J., Potvin, J., and Mangel, M., Exploring the effects of reductions in krill biomass in the Southern Ocean on blue whales using a state-dependent foraging model, *Ecological Modeling*, 222, 3366-3379 (2011); Rolland, R.M., Schick, R.S., Pettis, H.M., Knowlton, A.R., Hamilton, P.K., Clark, J.S. and Kraus, S.D. Health of North Atlantic right whales *Eubalaena glacialis* over three decades: From individual health to demographic and population health trends, *Marine Ecology Progress Series*, 542, 265-282 (2016); Lomac-MacNair, K. and Smultea, M. A., Blue whale (*Balaenoptera musculus*) behavior and group dynamics as observed from an aircraft off Southern California, *Animal Behavior and Cognition*, 3(1), 1-21 (2016).

[32] Rockwood, R. C., Calambokidis, J., and Jahncke, J., High mortality of blue, humpback, and fin whales from modeling vessel collisions o the U.S. West Coast suggests population impacts and insufficient protection, *PLoS ONE*, 12(8), e0183052 (2017).

habitat for ocean noise mitigation. The areas were identified based on more than 9,000 visual sightings of blue whales, primarily from small boats, and cross-validated with habitat-based density models derived from systematic line-transect surveys.[33] Since September 2015, the Navy provided more extensive protection for the San Diego areas, but reduced those protections in its Consistency Determination. The conditions above restore those protections and extend them to cover "dipping" sonar, based on the new evidence, noted above, showing heightened marine mammal responses to that unpredictable noise source.

Blue whale acoustic detections have been recorded in the region from spring to early winter. Relatively high song production rates were also found to persist late into the fall, with the majority of all detections occurring between September and late December. (Few acoustic detections were made between mid-January and mid-April.)[34] The time period of these detections contrasts with sightings data that indicates that aggregations of blue whales are most likely to be present off southern California in from June 1 to October 31, the time period used to delineate the Navy's proposed mitigation measures in the region. Taken together, however, sighting and acoustic data indicate that blue whales are present at higher densities from June 1 to December 31, recommending an extension of the protection period to include the months of November and December.

3. Protection of important habitat for fin whales. The Navy will require that all surface vessels use extreme caution and proceed at a safe speed, so that they can take effective action to avoid a collision with marine mammals, and can stop within a distance appropriate to the prevailing circumstances and conditions. This condition will apply to waters within the Southern California Portion of the HSTT Study Area, defined in the Navy's Consistency Determination at Fig. 1-1, falling between the 200 meter and 1000 meter isobaths, from November 1 to May 31.

Rationale: High-use habitat for endangered fin whales directly overlaps with the Navy training ranges in the Southern California Bight.[35] Since 2009, fin whales on the Southern California Range Complex have aggregated during the winter months in waters just off the mainland shelf, between the 200 m and 1000 m isobaths.[36] This population is at particular risk of ship-strike given their shallower-water foraging in

[33] Calambokidis, J., *et al.*, Biologically Important Areas for selected cetaceans within U.S. waters – West coast region, *supra*.

[34] *Id.*

[35] Scales, K.L., Schorr, G.S., Hazen, E.L., Bograd, S.J., Miller, P.I., Andrews, R.D., Zerbini, A.N. and Falcone, E.A., Should I stay or should I go? Modelling year□round habitat suitability and drivers of residency for fin whales in the California Current, *Diversity and Distributions*, *23*(10), 1204-1215 (2017).

[36] Falcone, E.A. and Schorr, G.S. *Distribution and demographics of marine mammals in SOCAL through photo-identification, genetics, and satellite telemetry*, *supra*; Debich, A.J., Baumann-Pickering, S., Širović, A., Hildebrand, J.A., Herbert, S.T., Johnson, S.C., Rice, A.C., Trickey, J.S. and Wiggins, S.M., *Passive Acoustic Monitoring for Marine Mammals in the SOCAL Range Complex January–July 2014* (2015); Širovic, A., Rice, A., Chou, E., Hildebrand, J.A., Wiggins, S.M., and Roch, M.A. Seven years of blue and fin whale call abundance in the Southern California Bight, *Endangered Species Research*, *28*(1), 61-76 (2015); G. Schorr, pers. comm. to M. Jasny (2015).

relatively deep water,[37] and they have been known to be struck by vessels in the recent past. The most conservative model estimates mortality from ship strike off the U.S. west coast to be 2.7 times the NOAA-recommended limit for fin whales.[38]

4. Protection of the gray whale migration corridor. The Navy will observe a 10-knot speed restriction during transits of vessels, from December 1 through May 20, within 10 nautical miles of the California mainland.

   Rationale: Each year, virtually all gray whales migrate between their breeding lagoons of Baja California, Mexico, and their summer feeding grounds in the North Pacific and Arctic regions. This migration is comprised of virtually the entire population of California gray whales; a small sub-population of California gray whales called the Pacific Coast Feeding Group (thought to comprise only 200 animals); and at least some gray whales that feed in the western North Pacific and are listed under the federal Endangered Species Act.[39] Although the risk is very small, a lethal vessel strike of the Pacific Coast Feeding Group or of a western North Pacific gray whale could potentially jeopardize the survival of those populations.

   The Navy's Gray Whale Awareness Notification Message Area provides protection through requirements for increased awareness and additional vigilance for gray whales out to 10 nautical miles of the California mainland,[40] between November 1 and March 31. The width of this area is protective, as the majority of gray whales are thought to migrate within 10 km of the California mainland; however, the peak migration period for gray whales extends from December 1 through May 20 and does not establish a 10 knot speed restriction for transiting vessels. As such, the time period in which the Gray Whale Awareness Notification Message Area is in operation is under-protective and should be modified.

5. Protection of Marine Protected Areas. The Navy will exclude the following areas from all training and testing activities: (a) the Channel Islands National Marine Sanctuary, including the Channel Islands Sanctuary Cautionary Area (encompassing waters within 6 nautical miles of Santa Barbara Island); and (b) all State Marine Reserves falling within the Southern California Portion of the HSTT Study Area defined in the Navy's Consistency Determination at Fig. 1-1, including Begg Rock State Marine Reserve, Santa Barbara Island State Marine Reserve, Long Point State Marine Reserve, Laguna Beach State Marine

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[37] Falcone, E.A. and Schorr, G.S., *Distribution and demographics of marine mammals in SOCAL through photo-identification, genetics, and satellite telemetry*, *supra*; Rockwood, R. C., Calambokidis, J., and Jahncke, J., High mortality of blue, humpback, and fin whales from modeling vessel collisions o the U.S. West Coast suggests population impacts and insufficient protection, *supra*.

[38] *Id.*

[39] Calambokidis, J., *et al.*, Biologically Important Areas for selected cetaceans within U.S. waters – West Coast Region, *supra*; Weller, D. W., Klimek, A., Bradford, A. L., Calambokidis, J., Lang, A. R., Gisborne, B., Burdin, A.M., Szaniszlo, W., Urban, J., Gomez-Gallardo Unzueta, A., Swartz, S., Brownell, R. L., Jr., Movements of gray whales between the western and eastern North Pacific, *Endangered Species Research, 18,* 193-199 (2012).

[40] U.S. Department of the Navy, *Draft Environmental Impact Statement/ Overseas Environmental Impact Statement for Hawaii-Southern California Training and Testing*, at App. K (2017).

Reserve, Matlahuayl State Marine Reserve, South La Jolla State Marine Reserve, and Cabrillo State Marine Reserve.

Rationale: State Marine Reserves are marine areas that are managed so as to achieve one or more of the following: (1) protect or restore rare, threatened or endangered native plants, animals or habitat in marine areas; (2) protect or restore outstanding, representative or imperiled marine species, communities, habitats and ecosystems; (3) protect or restore diverse marine gene pools; or (4) contribute to the understanding and management of marine resources and ecosystems by providing the opportunity for scientific research in outstanding, representative or imperiled marine habitats or ecosystems. The condition outlined above is designed, inter alia, to avoid take of any living marine resource, which is prohibited in State Marine Reserves under California law.

Similarly, the condition outlined for the Channel Island National Marine Sanctuary is designed to provide additional mitigation measures for all protected marine species and resources in the portion of the Channel Island National Marine Sanctuary that falls within the boundary of the HSTT Study Area (*i.e.*, the waters surrounding Santa Barbara Island out to 6 nautical miles).

6. Derogation. The Navy may conduct any testing or training activity otherwise prohibited or restricted under conditions 1 through 5 provided that the Navy, at the highest command authority, deems it necessary for national defense. This authority may be invoked only by the Commander, or Acting Commander, U.S. Pacific Fleet, for training activities; or the appropriate Commander, or Acting Commander, Systems Command (Naval Air Systems Command, Naval Sea Systems Command, Space and Naval Warfare Systems Command), or Chief of Naval Research, or Acting Chief, Office of Naval Research, for testing activities. For any invocation of the authority provided in this paragraph, the Navy will provide notification to the Commission.

   Rationale: This derogation provision, which the Navy has implemented since September 2015 under the *Conservation Council* agreement, affords flexibility in case of a genuine national defense need, while ensuring, through its involvement of high command authority, that the decision to exempt an activity is not made lightly. It also provides transparency of implementation through a reporting provision.

7. Avoidance of activities involving in-water detonations in low-visibility conditions. To the maximum extent practicable, the Navy will avoid conducting activities involving underwater detonations at night and in other low-visibility conditions (i.e., in fog or in sea-state conditions greater than Beaufort 4. The Navy will annually report any instances of non-compliance with this condition, including a supporting rationale, to the Commission.

Rationale: At night and during periods of low-visibility, the Navy's ability to detect marine mammals within its safety zone declines significantly.[41] Additionally, some endangered species, such as the blue whale, engage in rest or shallow diving during the night, increasing their vulnerability to ship collision and to injury from explosives and ordnance.[42] Fortunately, many individual Navy exercises, tests, and maintenance activities last eight hours or fewer,[43] making avoidance of nighttime activity possible, at least in some cases. This measure takes account of Navy operational need (as, for example, during major certification exercises, where some training scenarios can take days to unfold) by incorporating a practicability standard.

8. Passive acoustic monitoring. For all activities taking place on the Southern California ASW Range (SOAR), the Navy will use its fixed passive acoustic range instrumentation to monitor for marine mammal vocalizations and report the detection of any marine mammal to any vessels, aircraft, or other platforms conducting sonar or in-water detonations activity on the Range.

   Rationale: The Navy has substantial capability, on its Southern California ASW Range, to detect, identify, localize, and track various cetacean species in real time. That capability, which is based in a large, on-range hydrophone network covering about 400 square miles, has been used extensively for years to support behavioral response studies of marine mammals to sonar. Indeed, the Marine Mammal Commission has summarized some of the more impressive recent work at a similar Navy facility in Hawaii, including real-time tracking of humpback whales with a localization error rate of 2 percent or less, and localizing of bottlenose dolphins within 100 meters of the animal's position. Yet the Navy claims that it lacks the capacity to monitor instrumented ranges in real time for mitigation purposes. As the U.S. Marine Mammal Commission has noted, the Navy's capacity to monitor its instrumented range for marine mammals, in real time, "clearly exists," and should be used during training and testing activities to avoid marine mammal interactions.[44]

9. Thermal monitoring systems. The Navy will establish a pilot program for the use of automated thermal detection systems in marine mammal mitigation. In conducting this program, the Navy will require selected surface vessels, and, if feasible, aircraft, to incorporate thermal detection systems into their protocols for detecting marine mammals

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[41] *E.g.*, Barlow, J., Gerrodette, T. and Forcada, J., Factors affecting perpendicular sighting distances on shipboard line-transect surveys for cetaceans, *Journal of Cetacean Research and Management* 3: 201-212 (2001); Barlow, J., and Gisiner, R., Mitigation and monitoring of beaked whales during acoustic events, *Journal of Cetacean Research and Management* 7: 239-249 (2006).

[42] Goldbogen, J.A., *et al.*, Mechanics, hydrodynamics and energetic of blue whale lunge feeding: efficiency dependence on krill density, *supra*; *see also*, *e.g.*, Calambokidis, J., Schorr, G.S., Steiger, G.H., Francis, J., Bakhtiari, M., Marshal, G., Oleson, E.M., Gendron, D. and Robertson, K., Insights into the underwater diving, feeding, and calling behavior of blue whales from a suction-cup attached video-imaging tag (CRITTERCAM), *Marine Technology Society Journal* 41: 19-29 (2007).

[43] U.S. Department of the Navy, *Draft Environmental Impact Statement/ Overseas Environmental Impact Statement for Hawaii-Southern California Training and Testing*, at App. A (2017).

[44] Comments of Rebecca Lent, Marine Mammal Commission, to Naval Facilities Engineering Command, Pacific (Nov. 13, 2017) (citing various combined cruise reports and lookout effectiveness studies from 2010 through 2014).

and mitigating impacts during sonar and in-water detonation activity. The Navy will report annually to the Commission on the operations and results of the pilot program.

Rationale: Because mitigation measures based on visual observation, such as safety zone maintenance, results in highly limited risk reduction for most species and under most conditions,[45] we view alternative detection measures as a significant area for development. Thermal detection offers a supplement to visual detection measures and has been demonstrated to outperform observers in number of detected whale blows and ship-whale encounters due to its ability to continuously monitor a 360° field of view during both daylight and nighttime hours.[46] In addition, aerial-mounted infrared cameras have proven able to detect thermal 'trails' up to 300 m behind humpback whales, formed by the thermal mixing of the stratified water that persists for up to 2 minutes.[47] The emerging development of automated whale blow detection systems for infrared video[48] also indicate this technology can feasibly be used for real-time whale detection and mitigation.

According to the Draft Environmental Impact Statement that the Navy has prepared for the activities under consistency review, the Navy "plans to continue researching thermal detection systems to determine their effectiveness and compatibility with Navy applications."[49] A pilot program would be consistent with that interest, while allowing for trial use as a monitoring measure.

10. Research on sonar signal modification. The Navy will undertake research on sonar signal modification, to determine if certain modifications reduce the onset or severity of the behavioral response of marine mammals to the sonar signal. As part of this research effort, the Navy will incorporate in-field testing of modified sonar signals within its Southern California behavioral response studies and will include controlled exposures of beaked whales. The Navy will report to the Commission within three years on the findings from this research.

Rationale: As noted above, at least one small, resident population of beaked whales coincides with the Navy's instrumented Southern California ASW Range and is therefore continually exposed to high-intensity mid-frequency sonar. Since activities on

[45] *E.g.*, Leaper, R., Calderan, S. and Cooke, J., A simulation framework to evaluate the efficiency of using visual observers to reduce the risk of injury from loud sound sources, *Aquatic Mammals*, 41(4), 375 (2015).

[46] Burkhardt, E. Kindermann, L., Zitterbart, D., and Boebel, O., *Detection and tracking of whales using a shipborne, 360° thermal-imaging system, in* Popper, A.N., and Hawkins, A. (eds.), *The Effects of Noise on Aquatic Life* (2012); Zitterbart D.P., Kindermann, L., Burkhardt, E., and Boebel, O., Automatic round-the-clock detection of whales for mitigation from underwater noise impacts, *PLoS ONE*, 8, e71217 (2013); Peckham, J., O'Young, S.D., and Jacobs, J.T., Comparison of medium and long wave infrared imaging for ocean based sensing, *Journal of Ocean Technology*, 10, 113-128 (2015).

[47] Churnside, J., Ostrovsky, L., and Veenstra, T., Thermal footprints of whales, *Oceanography*, 22, 206-209 (2009).

[48] Santhaseelan, V., and Asari, V.K., Automated whale blow detection in infrared video, *in* Zhou, J. (ed.), *Computer Vision and Pattern Recognition in Environmental Informatics* 58-78 (2015); Zitterbart, D.P., *et al.*, Automatic round-the-clock detection of whales, *supra*.

[49] U.S. Department of the Navy, *Draft Environmental Impact Statement/ Overseas Environmental Impact Statement for Hawaii-Southern California Training and Testing*, at 5-65.

that Range cannot easily be reduced or prohibited, the habitat avoidance measures that NOAA and the scientific community have recognized as the most effective available mitigation for sonar training are largely unavailable. To reduce conflict and protect these species, it is necessary to find other effective approaches to mitigation.

Recent studies on harbor porpoise, a highly sensitive marine mammal, indicate that modifying the sonar signal could substantially reduce behavioral disruption of marine mammals without interfering with the effectiveness of Navy systems.[50] Those studies have found, for example, that replacing the Navy's conventional up-sweeps with down-sweeps—a modification that would not alter the system's spectral output in any way—substantially reduce the signal's disruptive effect on porpoises. These findings have tangible management implications and potentially broad benefits to multiple species, including those populations, like the Cuvier's beaked whale population in San Nicholas Basin, that have nowhere to go. Yet, to our knowledge, the Navy is not presently investigating signal modification as a potential mitigation measure. There is clearly a need to understand the extent to which results observed for harbor porpoise can be generalized across species, including beaked whales.

Southern California presents the best possible opportunity for advancing mitigation area in this area. Not only does the Navy maintain test pools at its SPAWAR facility in San Diego, but its multi-year Southern California behavioral response studies provide baseline data and a vehicle for testing the effects of sonar modifications in the field. Research on modified signals can be incorporated into those ongoing behavioral response studies as a variant on exposure experiments on tagged animals, for which there already exists data on blue whales, fin whales, Cuvier's beaked whales, and other species. We strongly recommend that the Commission include this research in any conditions it might identify for the Navy.

11. Research to define additional important habitat for beaked whales. The Navy will undertake research on three beaked whale hotspots necessary to determine the geographic extent and seasonality of the relatively high beaked whale concentrations detected there, for purposes of defining additional areas for potential mitigation. The Navy will report its findings to the Commission within three years. These three areas are defined as follows:

    (a) An area at the southernmost edge of California Current, west of Tanner and Cortez Banks, in the vicinity of the coordinates 32.75 N., -119.46 W. (location "E" in Panel A at Map 3);

[50] *E.g.*, Kastelein, R.A., Steen, N., Gransier, R., and de Jong, C.A.F., Threshold received sound pressure levels of single 1-2 kHz and 6-7 kHz up-sweeps and down-sweeps causing startle responses in a harbor porpoise (*Phocoena phocoena*), *Journal of the Acoustical Society of America*, 131, 2325-2333 (2012); Kastelein, R.A., Schop, J., Gransier, R., Steen, N., and Jennings, N., Effect of series of 1 to 2 kHz and 6 to 7 kHz up-sweeps and down-sweeps on the behavior of a harbor porpoise (*Phocoena phocoena*). *Aquatic Mammals*, 40, 232-242 (2014); Kastelein, R.A., van den Belt, I., Gransier, R., and Johansson, T., Behavioral response of a harbor porpoise (*Phocoena phocoena*) to 25.5- to 24.5-kHz sonar down-sweeps with and without side bands, *Aquatic Mammals*, 41, 400-411 (2015).

(b) An area in the northern Santa Catalina Basin and the waters southeast of Santa Catalina Island, in the vicinity of the coordinates 33.28 N., -118.25 W. (location "A" in Panel B at Map 3); and

(c) An area in the San Clemente Basin, in the vicinity of the coordinates 32.52 N., -118.32 W. (location "S" in Panel B at Map 3).

Rationale: Evidence based on 28 years of acoustic data in the Southern California Bight[51] suggests that southern offshore waters, west of Tanner and Cortez Banks, represent important habitat areas for beaked whales, particularly for Cuvier's.[52] This area had the highest average daily detection rates of Cuvier's beaked whales relative to 16 other locations systematically sampled across the region, from Point Conception to an area south of San Diego.[53] The substantial majority of these calls were detected between November and June, suggesting seasonal concentrations.[54] This area is located at the southernmost edge of the California Current, where the Current meets the Ensenada Front, and the enhanced primary productivity resulting from the interaction between bathymetry and oceanography likely supports biologically important foraging habitat for this species.[55]

The same long-term passive acoustic study of the Southern California Bight[56] also indicates that southern-central waters represent biologically important habitat for Perrin's beaked whale. This species has been found nowhere outside California, with all but one identified whales occuring in the Southern California region.[57] Perrin's calls were detected primarily within the southern-central waters of the Bight, in the northern Catalina Basin, including south-east of Santa Catalina Island, and the San Clemente Basin. These areas are likely to be biologically important feeding habitat resulting from the influence of the Southern California Eddy, a surface counterclockwise gyre that carries water northward through the central Bight, increasing levels of primary productivity.[58]

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[51] Baumann-Pickering, S., et al., Spatio-temporal patterns of beaked whale echolocation signals in the North Pacific, *supra*.

[52] Baumann-Pickering, S., et al., Spatio-temporal distribution of beaked whales in southern California waters, *supra*; Baumann-Pickering, S., *et al.*, *Modeling of Habitat and Foraging Behavior of Beaked Whales in the Southern California Bight*, *supra*.

[53] *Id.*

[54] *Id.*

[55] Venrick, E.L., Summer in the Ensenada Front: the distribution of phytoplankton species, July 1985 and September 1988. *Journal of Plankton Research*, 22, 813-841 (2000).

[56] Baumann-Pickering, S., et al. (2014) Spatio-temporal distribution of beaked whales in southern California waters, *supra*; Baumann-Pickering, S., et al. (2015). *Modeling of Habitat and Foraging Behavior of Beaked Whales in the Southern California Bight, supra*.

[57] Dalebout, M.L., Mead, J.G., Baker, C.S., Baker, A.N. and van Helden, A.L., A new species of beaked whale *Mesoplodon perrini* sp. n. (Cetacea: Ziphiidae) discovered through phylogenetic analyses of mitochondrial DNA sequences, *Marine Mammal Science*, 18(3), 577-608 (2002).

[58] National Research Council, *The Southern California Bight*. In: *Monitoring Southern California's Coastal Waters*, The National Academies Press, Washington, DC, pp. 1-15 (1990); Venrick, E.L., Summer in the Ensenada Front: the distribution of phytoplankton species, July 1985 and September 1988, *supra*; Baumann-Pickering, S., et al. (2015). *Modeling of Habitat and Foraging Behavior of Beaked Whales in the Southern California Bight, supra*.

It is important that the boundaries of both these areas be better defined to inform the implementation of mitigation measures necessary to avoid population-level impacts.

IV. Conclusion

For these and other reasons, we respectfully recommend that the Commission object to the Navy's consistency determination, as the Navy's proposed activities are plainly not consistent to the maximum extent practicable with the state's coastal policies. To the extent that the Commission also identifies measures that might allow it to reach concurrence, we ask it to include conditions, as described in these comments, that protect important habitat and provide other mitigation for the most vulnerable marine mammal populations.

As the Navy recognizes, national security and environmental protection are not mutually exclusive. Minimizing impacts on Southern California wildlife is imperative given the extent of the Navy's activities. In that effort, we fully support the Commission's efforts to ensure the consistency of these activities with California's Coastal Zone Management Program, and we appreciate the opportunity to comment on this important determination.

Very truly yours,

Michael Jasny
Director, Marine Mammal Protection
Natural Resources Defense Council

Susan Jordan
Executive Director
California Coastal Protection Network

ATTACHMENT A
The Court's Decision in *Conservation Council*

In March of 2015, the federal district court in Hawai'i held that the EIS for Hawai'i-Southern California Training and Testing ("HSTT") activities from December 2013 to December 2018 violated the National Environmental Policy Act ("NEPA"). *See Conservation Council for Hawai'i v. National Marine Fisheries Serv. and NRDC v. National Marine Fisheries Serv.*, 97 F. Supp. 3d 1210, 1236-38 (D. Haw. 2015) (hereinafter cited as "*Conservation Council*"). The court's findings in *Conservation Council* are, of course, highly relevant to the Navy's present environmental analysis.

The Hawai'i district court focused on the agencies' failure to discuss alternatives to the proposed training and testing, in compliance with NEPA. As noted, the regulations implementing NEPA identify the alternatives section as "the heart of the environmental impact statement." 40 C.F.R. § 1502.14. In this section, the agencies must "[r]igorously explore and objectively evaluate all reasonable alternatives," devoting "substantial treatment to each alternative considered in detail... so that reviewers may evaluate their comparative merits." *Id.* § 1502.14(a), (b); *see also Muckleshoot Indian Tribe v. U.S. Forest Serv.*, 177 F.3d 800, 814 (9th Cir. 1999) ("viable but unexamined alternative renders [EIS] inadequate"); *'Ilio'ulaokalani Coalition v. Rumsfeld*, 464 F.3d 1083, 1101 (9th Cir. 2006) (failure to consider reasonable alternative "renders the Army's EISs inadequate"). Further, the regulations specify that the final EIS must "[i]nclude the alternative of no action." 40 C.F.R. § 1502.14(d).

The Ninth Circuit has explained:

> Congress wanted each federal agency spearheading a major federal project to put on the table, for the deciding agency's and for the public's view, a sufficiently detailed statement of environmental impacts and alternatives so as to permit informed decision making. The purpose of NEPA is to require disclosure of relevant environmental considerations that were given a "hard look" by the agency, and thereby to permit informed public comment on proposed action and any choices or alternatives that might be pursued with less environmental harm.

Lands Council v. Powell, 395 F.3d 1019, 1027 (9th Cir. 2005).

The Hawai'i district court held that, by limiting the range of action alternatives considered in detail to only (1) more training and testing and (2) yet more training and testing, the last EIS failed to present "any choices or alternatives that might be pursued with less environmental harm." *Lands Council*, 395 F.3d at 1027; *see Conservation Council*, 97 F. Supp. 3d at 1237-38. The court specifically faulted the Navy for refusing to consider alternatives that would reduce harm to marine mammals by prohibiting or restricting HSTT activities in specific areas identified as biologically important. The court rejected as "pure hyperbole" the Navy's claim

that, "out of an ocean area bigger than the land mass occupied by the entire United States, it is simply not feasible to say that even a single square mile outside of the Humpback National Marine Sanctuary that the Navy could possibly avoid using for any period without reducing military readiness." *Conservation Council*, 97 F. Supp. 3d at 1238. It concluded that "the Navy's categorical and sweeping statements, which allow for no compromise at all as to space, time, species, or condition, do not constitute the 'hard look' required by NEPA." *Id.*

Following the court's summary judgment ruling, the Navy and NMFS voluntarily entered into a settlement agreement with Plaintiffs that imposed time and geographic restrictions on HSTT activities, with the aim of protecting marine areas identified as biologically important to various marine mammal populations. In so doing, the agencies acknowledged the feasibility of adopting time-area restrictions to reduce adverse impacts on marine mammals. In completing its present EIS, the Navy must thoroughly analyze a range of alternatives involving varying levels of restrictions in sensitive marine habitat, "to permit informed public comment on" not only the agencies' preferred course of action, but also "any choices or alternatives that might be pursued with less environmental harm." *Lands Council*, 395 F.3d at 1027.

In its March 2015 decision, the Hawai'i district court concluded that, in addition to violating NEPA, NMFS's authorization of the Navy's HSTT activities also violated the MMPA and the Endangered Species Act ("ESA"). NEPA's implementing regulations require agencies, "[t]o the fullest extent possible," to integrate the EIS process with the analysis required under the MMPA and the ESA. 40 C.F.R. § 1502.25(a). Accordingly, in completing their EIS for the present round of HSTT permitting, the agencies should include information that is essential to evaluate the compliance of the Navy's proposed activities with the MMPA and ESA. Such information includes, but is not limited to:

- Species- or stock-specific information supporting findings for each affected marine mammal species or stock, as NMFS may not conclude, under the Marine Mammal Protection Act, that an activity will have only a "negligible impact" on a particular species or stock if it has no information on which to do so, *see id.* at 1225;

- A comparison of levels of incidental mortality to each marine mammal stock's potential biological removal ("PBR") level and an evaluation of potentially non-negligible impacts where incidental mortality exceeds PBR, *see id.* at 1225-28;

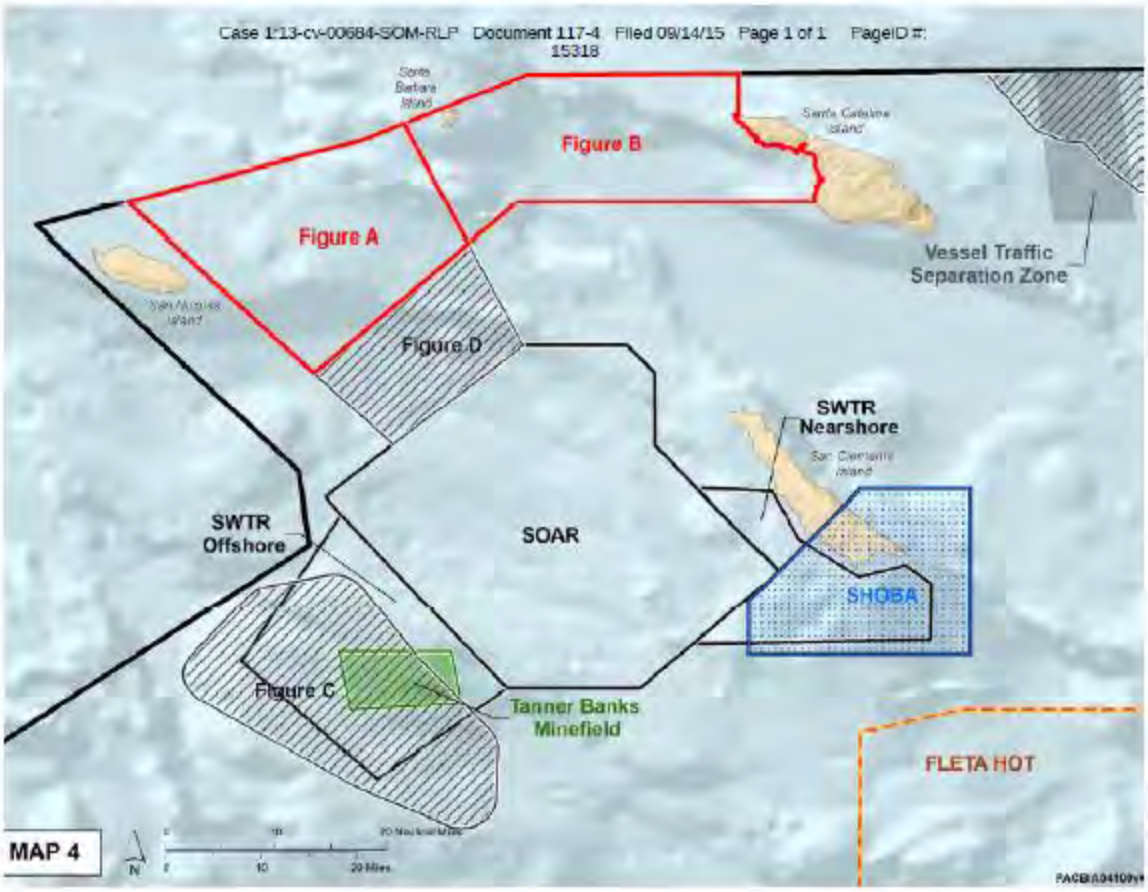
- Thorough "analysis of ways to mitigate the negative effects of the Navy's activities on affected species and stocks," *id.* at 1229, including consideration of time/area restrictions or "measures of equivalent effect," *id.* at 1231; and

- The impact on endangered sea turtles of the levels of take for which the Navy seeks ESA authorization, *id.* at 1234-35.

Chair Bochco and Members of the Commission
May 24, 2018
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ATTACHMENT B
Supporting Maps

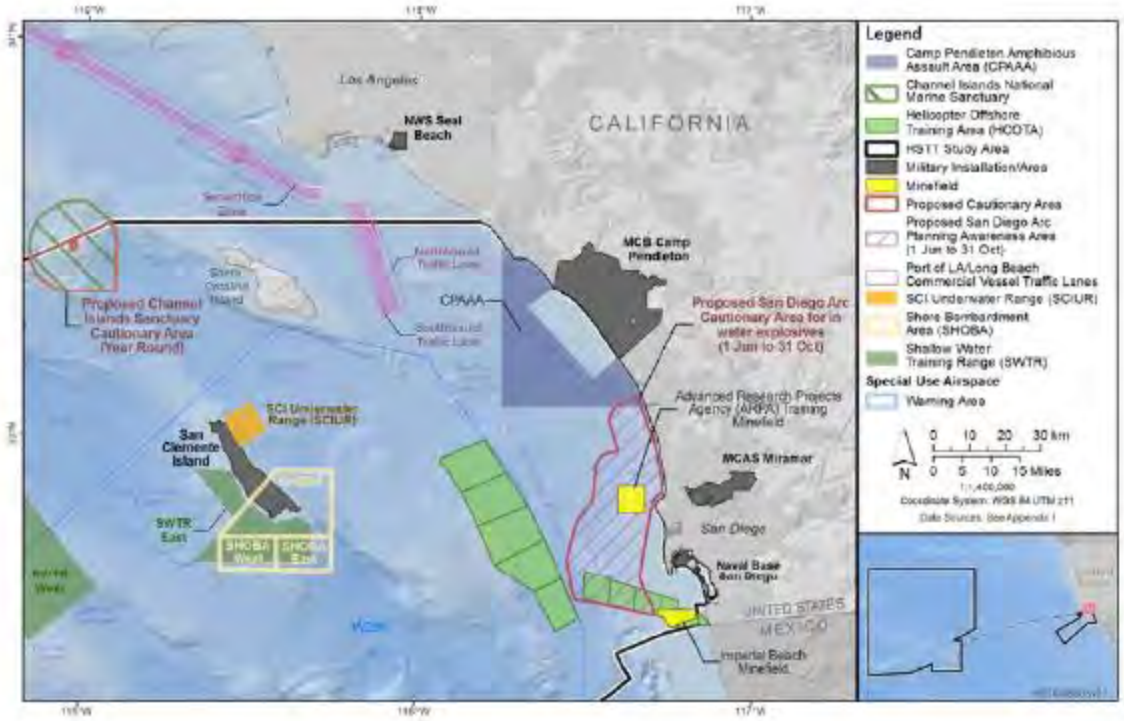
Map 1.



Map 1: Marine mammal mitigation areas around the Navy's Southern California ASW Range off San Clemente Island, with mitigation areas labeled as Figures A through D. These areas were established in September 2015 by a Settlement Agreement and Order in the Conservation Council *cases. Reproduced from the Settlement Agreement and Order.*

Chair Bochco and Members of the Commission
May 24, 2018
Page 22

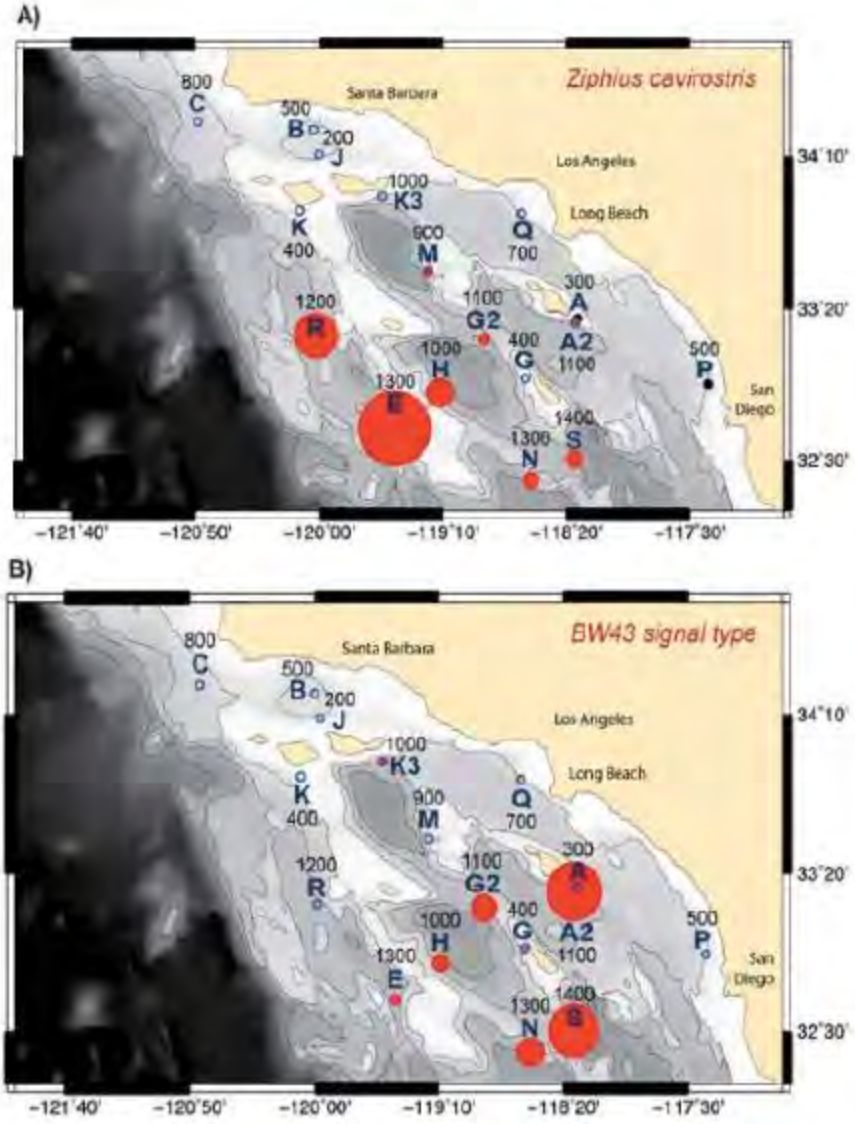
Map 2.



Map 2: Navy operations areas, with San Diego Arc Planning Awareness and Cautionary Areas identified by red-striped polygon. *Reproduced from the Navy's Consistency Determination.*

Chair Bochco and Members of the Commission
May 24, 2018
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Map 3.



Map 3: Relative presence (comparison of average daily encounter duration) of A) Cuvier's beaked whale and B) BW43 signal type at 18 sites in Southern California. Blue circles at sites indicate no acoustic encounters; black filled circles in A) indicate <1% relative presence. Adapted from Baumann-Pickering et al. (2015).

DEPARTMENT OF THE NAVY
COMMANDER
UNITED STATES PACIFIC FLEET
250 MAKALAPA DRIVE
PEARL HARBOR, HAWAII 96860-3131

IN REPLY REFER TO:
5090
Ser N46B/1455
October 16, 2018

Mr. Mark Delaplaine
Manager, Energy, Ocean Resources,
and Federal Consistency Division
California Coastal Commission
45 Fremont Street, Suite 2000
San Francisco, California 94105-2219

Dear Mr. Delaplaine:

SUBJECT: CONSISTENCY DETERMINATION FOR PROPOSED MILITARY READINESS ACTIVITIES IN SOUTHERN CALIFORNIA

Thank you for thoroughly considering the Navy's responses to the Commission's objection to the Navy's Consistency Determination (CD) for proposed military readiness activities within the southern California portion of the Hawaii-Southern California Training and Testing (HSTT) Study Area. The Navy has reviewed the Commission staff letter of October 5, 2018 summarizing the discussions that have taken place. The Navy's letter of August 24, 2018 contains our detailed responses to the Commission's measures, including those offered by the Natural Resources Defense Council (NRDC), as determined necessary for the Commission to concur with the activity. The Navy appreciates the staff and Commissioners' review of these materials as well as the opportunity to present this information with an open discussion with the Commissioners at the status update in Fort Bragg on September 12, 2018.

The Navy recognizes that through the exchange of information, to include the HSTT NEPA process, the submission of the CD in April 2018, the June hearing in Chula Vista, the status update in Fort Bragg, and in working with the staff throughout the process, considerable progress has been made toward reaching agreement with the Commission that the Navy's proposed activities are fully consistent with the applicable enforceable policies of the California Coastal Management Plan (CCMP). Specifically, our August 24, 2018 submittal reflects a careful and thorough consideration of the Commission's findings by Navy scientists, planners, operational commanders, and leadership. The Navy agreed to additional geographic mitigation measures (beyond those already proposed) in response to the geographic measures contained in your July findings. The Navy also provided a detailed rationale for those geographic measures it was unable to implement. Similarly, for the procedural measures you requested, the Navy's August 24, 2018 letter explains that in many cases the Navy is complying either fully or partially with many of the measures. For those procedural measures that the Navy is unable to implement, such as larger shutdown zones and Navy vessel speed restrictions, a thorough explanation has been provided as to why the measures are not necessary or are not practical to implement.

The Navy also appreciates the Commission's agreement at the status update in Fort Bragg to a future presentation of the Navy's research and monitoring program to the Commission and public. The Navy is a leader in funding research on marine mammals worldwide, especially in Southern California. We look forward to this presentation and will work with staff to schedule it.

5090
Ser N46B/1455
October 16, 2018

Despite the considerable progress made toward resolving the differences and the Navy's willingness to continue dialogue, the Navy faces a need to complete the HSTT regulatory processes to support continued training and testing. The October 5, 2018 Commission staff letter states that there is not sufficient new information to recommend a change in the Commission's objection. Having therefore attempted, but been unable to resolve the differences, the Navy hereby provides notification, pursuant to 15 C.F.R. §930.43(e), that the Navy will proceed with the proposed HSTT activities. The Navy has determined that these activities are fully consistent with the applicable enforceable policies of the CCMP in accordance with 15 C.F.R. §930.43(d)(2). Also, as discussed in our August 24, 2018 letter, we note that the additional measures requested by the Commission, to which the Navy cannot agree, create a significant conflict with the Navy's Title 10 requirements to prepare naval forces for prompt and sustained combat operations at sea.

Concerning the two specific items on which the October 5, 2018 letter invites a Navy response:

1. The Navy continuously evaluates the efficacy of sonar systems and signals for their tactical applications. The Navy also continues funding of marine mammal behavioral response studies to determine if it is signal property or some other combination of variables (ex., distance from a source, signal strength, behavioral state) that leads to a response or a lack of response. To date, such research has shown perceived responses to be highly variable by species (where some species respond and others do not) and by individual (some individuals within a species may respond while some may not).

2. The Navy agrees to annually provide the Commission staff the instances where there was a national security requirement to deviate from the geographic mitigation measures for the California portion of the study area. This information will be provided to the staff in the annual exercise report prepared for the National Marine Fisheries Service.

The Navy values and protects the coast and the marine resources of California where our Sailors live, train, and defend our homeland. We are proud of the environmental stewardship of our installations and our testing and training activities. While this completes the Coastal Zone Management Act Federal Consistency process for the current HSTT effort, we look forward to continuing our close relationship with the Commission.

Sincerely,

T. C. LIBERATORE
Deputy Fleet Civil Engineer
By direction
of the Commander

Copy to:
Chief of Naval Operations (N454)
Commander, Navy Region Southwest (N40)

2

J.2.2 HAWAII

DEPARTMENT OF THE NAVY
COMMANDER
UNITED STATES PACIFIC FLEET
250 MAKALAPA DRIVE
PEARL HARBOR, HAWAII 96860-3131

IN REPLY REFER TO
5090
Ser N465/0744
May 09, 2018

Mr. Luis. P. Salaveria
Director, Hawaii Department of Business, Economic Development & Tourism
Office of Planning
P.O. Box 2359
Honolulu, HI 96804

Dear Mr. Salaveria:

SUBJECT: CONSISTENCY DETERMINATION FOR PROPOSED MILITARY READINESS ACTIVITIES IN THE HAWAII RANGE COMPLEX

In accordance with 15 C.F.R. §930, the U.S. Navy, Commander, U.S. Pacific Fleet is submitting the enclosed Consistency Determination (CD) for proposed military readiness activities within the Hawaii Range Complex. The Navy has determined the proposed action is consistent to the maximum extent practicable with the applicable enforceable policies of the Hawaii Coastal Management Program for the reasons identified in the enclosed CD. The CD is being submitted for consideration by the Office of Planning. These military readiness activities are a continuation of activities that have been conducted in the same areas for decades and have been the subject of prior consistency reviews by the Office of Planning, most recently in 2013.

A separate CD addressing military readiness activities in Southern California was submitted to the California Coastal Commission for their consideration under the California Coastal Zone Management Program.

In addition to the Coastal Zone Management Act federal consistency requirements addressed by the submission of the enclosed CD, the Navy is addressing compliance with other environmental laws as follows:

a. National Environmental Policy Act and Executive Order 12114. Navy released the Draft Environmental Impact Statement/Overseas Environmental Impact Statement (EIS/OEIS) in October, 2017.

b. Marine Mammal Protection Act. Navy is seeking a Letter of Authorization from the National Marine Fisheries Service.

c. Endangered Species Act. (ESA). Navy is consulting with NMFS and U.S. Fish and Wildlife Service under Section 7 of the ESA.

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Ser N465/0744
May 09, 2018

d. National Historic Preservation Act (NHPA). Navy is consulting with the State Historic Preservation Officer, Advisory Council on Historic Preservation, National Park Service, Native Hawaiian Organizations, and other interested parties under Section 106 of the NHPA.

Information and reporting regarding on-going Navy training and testing activities in the study area, as well as Navy sponsored research and monitoring, is available at https://www.navymarinespeciesmonitoring.us/reporting/pacific/. The Hawaii/ and Southern California Training and Testing Draft EIS/OEIS and other supporting documents are available at https://hstteis.com/.

If you have any questions please contact Mr. John Van Name, U.S. Pacific Fleet, (808) 471-1714, john.vanname@navy.mil.

Sincerely,

Lary M. Foster

L. M. FOSTER
By direction

Enclosure: CD for the Hawaii Range Complex

Copy to:
Chief of Naval Operations (N454) (w/o enclosure)
Mark Delaplaine, California Coastal Commission (w/enclosure)

2

OFFICE OF PLANNING
STATE OF HAWAII

DAVID Y. IGE
GOVERNOR

LEO R. ASUNCION
DIRECTOR
OFFICE OF PLANNING

235 South Beretania Street, 6th Floor, Honolulu, Hawaii 96813
Mailing Address: P.O. Box 2359, Honolulu, Hawaii 96804

Telephone: (808) 587-2846
Fax: (808) 587-2824
Web: http://planning.hawaii.gov/

DTS201807021119RI

July 2, 2018

Mr. Larry M. Foster
Department of the Navy
Commander
United States Pacific Fleet
250 Makalapa Drive
Pearl Harbor, Hawaii 96860-3131

Dear Mr. Foster:

Subject: Hawaii Coastal Zone Management Program Federal Consistency Review for Hawaii-Southern California Training and Testing Military Readiness Activities in the Hawaii Range Complex

The Office of Planning, Hawaii Coastal Zone Management (CZM) Program, has completed its review of the U.S. Navy Coastal Zone Management Act (CZMA) federal consistency determination, dated May 9, 2018 (received May 10, 2018), for military readiness activities in the Hawaii Range Complex associated with Hawaii-Southern California Training and Testing (HSTT). The military readiness activities occurring in the Hawaii Range Complex that are covered by this federal consistency review are those presented in the consistency determination, section 2.1 Proposed Action, and described in Chapter 2 Description of Proposed Action and Alternatives, of the HSTT Draft Environmental Impact Statement/Overseas Environmental Impact Statement (EIS/OEIS). According to the HSTT Draft EIS/OEIS, the proposed action includes two alternatives: Alternative 1, the preferred alternative, reflects a representative year of training and testing to account for the natural fluctuation of training cycles and deployment schedules that generally limit the maximum level of training from occurring every year in any five-year period; and Alternative 2, which reflects the maximum number of training and testing activities that could occur within a given year and assumes that the maximum level of activity would occur within a given year and assumes that the maximum level of activity would occur every year over any five-year period. Both Alternatives 1 and 2 were evaluated for consistency.

The Hawaii CZM Program objects in part and conditionally concurs in part with the Navy's determination that the conduct of HSTT military readiness activities in the Hawaii Range Complex is consistent to the maximum extent practicable with the enforceable policies of the Hawaii CZM Program. Pursuant to 15 CFR § 930.32(a)(1), "[t]he term 'consistent to the maximum extent practicable' means fully consistent with the enforceable policies of

management programs unless full consistency is prohibited by existing law applicable to the Federal agency."

Objection to Use of Explosives, In-Air and In-Water

The Hawaii CZM Program objects to the Navy's consistency determination for the use of explosives, both in-air and in-water, for training and testing activities in the Hawaii Range Complex, on the basis that projected impacts to State of Hawaii protected endangered and threatened species are in conflict with federally approved enforceable policies of the Hawaii CZM Program: Hawaii Revised Statutes (HRS) Chapter 195D Conservation of Aquatic Life, Wildlife, and Land Plants; and Hawaii Administrative Rules (HAR) Chapter 13-124 Indigenous Wildlife, Endangered and Threatened Wildlife, and Introduced Wild Birds. These Hawaii CZM Program enforceable policies, prohibit the "take" of endangered and threatened species (HRS § 195D-4(e)(2), HAR § 13-124-3(b)), i.e., "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect endangered or threatened species of wildlife, or to attempt to engage in any such conduct" (HRS § 195D-2, HAR § 13-124-2). A taking does not require that mortality or injury be caused to an endangered or threatened species.

The State of Hawaii lists the Pacific green sea turtle (Chelonia mydas agassizi) as a threatened species (HAR Chapter 13-124). According to the consistency determination, section 3.2.3.3.1.2 Explosive Stressors, Impacts from Explosives, and HSTT Draft EIS/OEIS, Appendix E, section E.18 Estimated Sea Turtle Impacts From Explosives Under Navy Training and Testing Activities, exposure levels of explosive sound and energy during training activities on green sea turtles in the Hawaii Range Complex is estimated to cause 1 injury per year, 7 occurrences of permanent threshold shift (PTS) per year, and 20 occurrences of temporary threshold shift (TTS) per year. The number of impacts to green sea turtles in the Hawaii Range Complex per five-year period from explosive training activities is estimated to be 3 injuries, 35 PTS occurrences, and 98 TTS occurrences (Appendix E, section E.19 Estimated Sea Turtle Impacts Per Five Year Period From Explosives Under Navy Training and Testing Activities). Injury, PTS, and TTS impacts to green sea turtles constitute a "take" pursuant to HRS Chapter 195D and HAR Chapter 13-124.

In addition, according to the HSTT Draft EIS/OEIS, section 3.9.3.2.2.7 Impacts from Explosives Under Alternative 1 for Training Activities, and for Testing Activities, birds could be injured or killed by in-air or in-water explosions. Explosive detonations also have the potential to cause PTS or TTS, "which could affect the ability of a bird to communicate with conspecifics or detect biologically relevant sounds (HSTT Draft EIS/OEIS, p. 3.9-64). The HSTT Draft EIS/OEIS identifies four species of endangered and threatened birds that are found in the Hawaii Range Complex, and are protected by the State of Hawaii under HAR Chapter 13-124: Hawaiian

petrel (Pterodroma sandwichensis, endangered); Short-tailed albatross (Phoebastria albatrus, endangered); Newell's shearwater (Puffinus auricularis newelli, threatened); and Band-rumped storm-petrel (Oceanodroma hydrobates castro, endangered). The potential impacts to these four species of birds caused by explosives constitute a "take" and, therefore, conflict with federally approved enforceable policies of the Hawaii CZM Program, HRS Chapter 195D and HAR Chapter 13-124.

The use of explosives will cause a "take" to State of Hawaii listed endangered and threatened species (identified above), and therefore, is not consistent with Hawaii CZM Program federally approved enforceable policies HRS Chapter 195D and HAR Chapter 13-124. On this basis, the Hawaii CZM Program objects to the Navy's consistency determination for the use of explosives, both in-air and in-water, for training and testing activities in the Hawaii Range Complex.

Conditional concurrence

The Hawaii CZM Program conditionally concurs with the Navy's determination that the conduct of HSTT military readiness activities, except for the use of explosives (see objection, above), in the Hawaii Range Complex is consistent to the maximum extent practicable with the enforceable policies of the Hawaii CZM Program.

Condition 1. The following condition shall apply to all HSTT operations and activities:

HSTT operations or activities shall not cause, or result in, the "take" of any State of Hawaii listed endangered or threatened species, i.e., "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect endangered or threatened species of wildlife, or to attempt to engage in any such conduct" (HRS § 195D-2, HAR § 13-124-2). A taking does not require that mortality or injury be caused to an endangered or threatened species. In addition, HSTT operations or activities shall not injure, kill, or destroy any State of Hawaii listed indigenous species, within or outside of the Hawaii CZM area, pursuant to Hawaii CZM Program enforceable policies HRS Chapter 195D and HAR Chapter 13-124. The State of Hawaii listing of endangered, threatened, and indigenous species is contained in HAR Chapter 13-124. The Hawaii CZM Program federally approved enforceable policies that apply to this condition are HRS Chapter 195D and HAR Chapter 13-124. This condition shall not apply to marine mammals.[1]

[1] Letter from Jane C. Luxton, NOAA General Counsel, to Frank R. Jimenez, General Counsel of the Navy (June 20, 2008)

Condition 2. The following condition shall apply to the monitoring of seabird populations at Kaula Island:

> In addition to State of Hawaii listed endangered and threatened species, indigenous wildlife, which includes seabirds that do not have either endangered or threatened status, are also protected by Hawaii CZM Program enforceable policies HRS Chapter 195D and HAR Chapter 13-124. HAR § 13-124-3 mandates that no person shall, or attempt to, injure, kill, or destroy any state listed indigenous species. The monitoring of seabird populations at Kaula Island was a condition required by previous federal consistency reviews (PMRF enhanced capability, January 5, 1999; Hawaii Range Complex, May 22, 2008) for the use of Kaula Island for military readiness activities to protect State of Hawaii endangered, threatened, and indigenous birds. The consistency determination, section 3.2.3.3.4 Seabirds, proposes to conduct only two additional surveys over the next four years, one each in July 2018 and July 2020, because, "[s]eabird use of Kaula has remained stable over the past 5 years (7 surveys)" (p. 3-52). Although the survey data indicates that a seabird population stabilizing trend may be developing, only two surveys in non-consecutive years, July 2015 and July 2017, show consistent seabird population numbers. Because only two surveys show consistent seabird populations, surveys need to be continued annually until the population stabilization can be verified. Therefore, it is a condition that the seabird monitoring surveys of Kaula Island continue on an annual basis for the next five years, 2018 through 2022. If the annual surveys definitively show that seabird populations at Kaula Island are stable, i.e., over 3 consecutive years/surveys, the Navy may request that this condition be modified to conduct monitoring surveys on a less frequent basis. The Hawaii CZM Program federally approved enforceable policies that apply to this condition are HRS Chapter 195D and HAR Chapter 13-124.

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If the requirements for conditional concurrences specified in 15 CFR § 930.4(a), (1) through (3), are not met, then all parties shall treat this conditional concurrence letter as an objection pursuant to 15 CFR Part 930, subpart C.

The Hawaii CZM Program solicited and received comments from the State Department of Land and Natural Resources, Division of Aquatic Resources (DAR), on the proposed activity. The DAR comments, which are enclosed, raise important concerns regarding marine mammals. Although the DAR concerns could not be factored into this conditional concurrence, the DAR comments are relevant and important to the Hawaii CZM Program, and therefore, are being provided for your consideration.

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Mr. Larry M. Foster
Department of the Navy
Commander
July 2, 2018
Page 5

The conditional concurrence portion of this decision does not represent an endorsement of the proposed activity nor does it convey approval with any other regulations administered by any state or county agency. Thank you for your cooperation in complying with the Hawaii CZM Program. If you have any questions, please call John Nakagawa of our CZM Program at (808) 587-2878.

Sincerely,

Leo R. Asuncion
Director

Enclosure

c: Mr. Jeffrey L. Payne, Director, NOAA Office for Coastal Management
Mr. Kerry Kehoe, NOAA Office for Coastal Management (by email)
Mr. David Kaiser, NOAA Office for Coastal Management (by email)
Ms. Catherine Gewecke, DLNR, Division of Aquatic Resources (by email)
Mr. Mark Delaplaine, California Coastal Commission (by email)

DEPARTMENT OF THE NAVY
COMMANDER
UNITED STATES PACIFIC FLEET
250 MAKALAPA DRIVE
PEARL HARBOR, HAWAII 96860-3131

IN REPLY REFER TO:
5090
Ser N46B/1456
October 16, 2018

Mr. Leo R. Asuncion
Director, Office of Planning
P.O. Box 2359
Honolulu, HI 96804

Dear Mr. Asuncion:

SUBJECT: CONSISTENCY DETERMINATION FOR PROPOSED MILITARY READINESS ACTIVITIES IN THE HAWAII RANGE COMPLEX

The Navy has reviewed the State of Hawaii's Office of Planning letter of July 2, 2018. In the letter you state an objection in part (to the use of explosives) and conditional concurrence in part with the Navy's Consistency Determination (CD) that activities conducted within the Hawaii Coastal Zone Management (CZM) Area are consistent to the maximum extent practicable with the enforceable policies of the Hawaii CZM Program.

The Navy appreciates the time your staff has taken to consult on these issues and thoroughly explain the position of the Hawaii CZM Program. After considering Hawaii's position and careful review of the underlying law and regulations, the Navy maintains that it is consistent to the maximum extent practicable with Hawaii's enforceable policies under the Hawaii CZM Program. It is our hope that through your consideration of the information brought up during our discussion and information offered below that we have narrowed the areas of disagreement.

The Hawaii CZM Program bases its objection on projected impacts to State of Hawaii listed endangered and threatened species from the use of in-air and in-water explosives. The Hawaii CZM Program believes that any take to these species is not consistent with federally approved enforceable policies of the Hawaii CZM Program. This is because, with few permissible exceptions, Hawaii Revised Statutes Chapter 195D Conservation of Aquatic Life, Wildlife, and Land Plants; and Hawaii Administrative Rules Chapter 13-124 Indigenous Wildlife, Endangered and Threatened Wildlife, and Introduced Wild Birds prohibit the take of any State of Hawaii listed endangered or threatened species.

The Hawaii CZM Program based their Conditional Concurrence on Navy complying with two conditions.

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Ser N46B/1456
October 16, 2018

- To meet the requirements of Condition 1, Hawaii-Southern California Training and Testing (HSTT) activities shall not cause, or result in, the "take of any State of Hawaii listed endangered or threatened species." Hawaii agreed that all Navy activities, with the exception of explosives, are consistent with this condition.

- To meet the requirements of Condition 2, seabird monitoring surveys of Kaula Island should continue on an annual basis for the next five years, 2018 through 2022.

Regarding Navy activities, including those which use explosives, that have the potential to take any State of Hawaii listed endangered or threatened species, the Navy maintains that these activities are consistent to the maximum extent practicable with the enforceable policies of the Hawaii CZM Program. The Navy's proposed action stems from the Navy's statutory requirement to prepare naval forces for prompt and sustained combat operations at sea. Training with sonar and explosives in the HSTT study area is integral to the Navy's ability to meet its Title 10 obligations, and strict compliance with a Hawaii enforceable policy that essentially prohibits all incidents of take, would undermine the Navy's ability to meet its statutory obligations. Any take occurring as a result of Navy's proposed activities would be incidental to, and not the purpose of, Navy's otherwise lawful training and testing activities.

The Navy is completing the regulatory process with the National Marine Fisheries Service (NMFS) and has completed consultation with the U.S. Fish and Wildlife Service (FWS) to ensure that the Navy's proposed action will not put the population and the future of these species in jeopardy, or adversely impact their viability as a coastal zone resource. The potential impacts to listed species from the Navy's proposed activities have been thoroughly analyzed by Navy biologists and rigorously scrutinized by experts from both the NMFS and the FWS. With regards to the four seabird species listed in your letter of July 2, 2018, the FWS concluded consultation on May 10, 2018 and determined that Navy's proposed action may affect, but is not likely to adversely affect the four listed species. Accordingly, the FWS has not issued any take for these species. The definition of take under the federal Endangered Species Act (ESA) is consistent with Hawaii's definition of take. Also, the Navy's proposed action includes an extensive suite of protective measures designed specifically to help the Navy avoid or minimize any potential impacts to protected species. These measures will be updated as appropriate upon completion of all Section 7 consultations. Overall, the Navy's compliance with the ESA will ensure that the activities proposed in the HSTT Environmental Impact Statement (EIS) are consistent with the objectives of the Hawaii CZM Program, while allowing the Navy to carry out its statutory mission to train and test naval forces to be prepared for combat at sea.

With regards to the condition to continue the annual monitoring surveys of seabird populations at Kaula Island for the next five years, 2018 through 2022, the Navy maintains that this condition is not required in order for the activities to be consistent to the maximum extent practicable with the Hawaii CZM program. The Navy reiterates its proposal to conduct aerial surveys of seabird populations on Kaula Island every two years. The proposed survey frequency is based on an adaptive management approach that takes into account the relative consistency of seabird species compositions on the island. During seven separate surveys conducted from 2013 through 2017, the collected data indicated no population-level effects from military training.

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October 16, 2018

Future surveys would continue to utilize the high altitude, high resolution aerial imagery technique employed at Kaula Island since 2013 and would standardize data collection in the late spring/summer timeframe, when seabird numbers are at their highest. The change in survey frequency better aligns monitoring effort with potential effects from military training and is warranted based on the demonstrated stability of the seabird populations. Should annual monitoring for overall population health be desired for purposes beyond those related to military training, the monitoring in alternate years could be conducted by the State of Hawaii, and the Navy would support the effort by coordinating access for the acquisition of aerial imagery consistent with applicable Federal laws and regulations.

Based on the above, it is the Navy's determination that the proposed military readiness activities in the Hawaii Range Complex are consistent with the enforceable policies of the Hawaii CZM Program to the maximum extent practicable. Therefore, in accordance with 15 CFR 930.43(e), the Navy is providing notification of its intent to proceed over the State of Hawaii's Office of Planning's objection to the Navy CD.

The Navy views its relationship with the State of Hawaii as essential to meeting its national security mandate and we look forward to continuing our professional relationship with the Office of Planning.

Sincerely,

T. C. LIBERATORE
Deputy Fleet Civil Engineer
By direction
of the Commander

Copy to:
Chief of Naval Operations (N454)

3

J.3 ENDANGERED SPECIES ACT

DEPARTMENT OF THE NAVY
COMMANDER
UNITED STATES PACIFIC FLEET
250 MAKALAPA DRIVE
PEARL HARBOR, HAWAII 96860-3131

IN REPLY REFER TO:
5090
Ser N465/0001
5 January 2018

Director, Office of Protected Resources
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
B-SSMC3, Room 13821
1315 East-West Highway
Silver Spring, MD 20910-3282

SUBJECT: REQUEST FOR INITIATION OF ENDANGERED SPECIES ACT SECTION 7 FORMAL CONSULTATION FOR COMMANDER, UNITED STATES PACIFIC FLEET TRAINING AND TESTING ACTIVITIES

In accordance with section 7 of the Endangered Species Act, the U.S. Navy requests initiation of formal consultation on Hawaii-Southern California Training and Testing (HSTT) activities occurring within the Pacific Ocean off the coast of Southern California and in the surrounding waters of the Hawaiian Islands.

The proposed action may affect listed species that reside within the HSTT Study Area by exposing them to sound and other environmental stressors associated with training and testing activities. The enclosed Biological Assessment is the Navy's primary document that provides the required information pursuant to 50 C.F.R. §402.12(f). The U .S. Navy is requesting formal consultation on Alternative 1 within the HSTT Draft Environmental Impact Statement/Overseas Environmental Impact Statement (DEIS/OEIS).

The Navy is requesting formal consultation on ESA-listed species addressed in this Biological Assessment including the blue whale (*Balaenoptera musculus*), fin whale (*Balaenoptera physalus*), western North Pacific gray whale (*Eschrichtius robustus*), the Mexico and Central America Distinct Population Segments of humpback whale (*Megaptera novaeangliae*), sei whale (*Balaenoptera borealis*), sperm whale (*Physeter macrocephalus*), main Hawaiian Islands insular false killer whale (*Pseudorca crassidens*), Guadalupe fur seal (*Arctocephalus townsendi*), Hawaiian monk seal (*Neomonachus schauinslandi*), green turtle (*Chelonia mydas*), hawksbill turtle (*Eretmochelys imbricata*), leatherback turtle (*Dermochelys coriacea*), loggerhead turtle (*Caretta caretta*), and olive ridley turtle (*Lepidochelys olivacea*). The Navy is also requesting concurrence on our Not Likely to Adversely Affect determinations for black abalone (*Haliotis cracherodii*), white abalone (*Haliotis sorenseni*), scalloped hammerhead shark (*Sphyrna lewini*) and steelhead (*Oncorhynchus mykiss*). In addition, the

5090
Ser N465/0001
5 January 2018

Navy is aware that critical habitat has been proposed for the main Hawaiian Islands insular false killer whale (82 Federal Register 51186) and will prepare an Addendum to the Biological Assessment to address this proposal.

Analysis supporting the application is contained within the Biological Assessment and in the Navy's 2017 HSTT DEIS/OEIS. Due to the large file size and page count (>750 pages), the Navy will be electronically submitting the Biological Assessment directly to the appropriate National Marine Fisheries Service staff.

Please extend my thanks to your staff for their continued support of the U.S. Navy's compliance process. We are available to meet with you or your staff should you have comments on the enclosed report or recommendations for future reports. My point of contact for these matters is Ms. Julie Rivers at 808-474-6391 or julie.rivers@navy.mil.

Sincerely,

FOR L. M. FOSTER
By direction

Copy to:
Ms. Kris Peterson, NMFS Office of Protected Resources, F/PR5

2

J.3.1 CALIFORNIA

DEPARTMENT OF THE NAVY
COMMANDER
UNITED STATES PACIFIC FLEET
250 MAKALAPA DRIVE
PEARL HARBOR, HAWAII 96860-3131

IN REPLY REFER TO:
5090
Ser N465/0451
March 15, 2018

Karen A. Goebel
Assistant Field Supervisor
U.S. Fish and Wildlife Service
Carlsbad Fish and Wildlife Office
6010 Hidden Valley Road, Suite 101
Carlsbad, CA 92011

Dear Mrs. Goebel:

SUBJECT: REQUEST FOR INFORMAL CONSULTATION UNDER SECTON 7 OF THE ENDANGERED SPECIS ACT FOR PROPOSED MILITARY READINES ACTIVITES IN SOUTHERN CALIFORNIA

In accordance with section 7 of the Endangered Species Act (ESA), the U.S. Navy requests informal consultation on proposed Hawaii-Southern California Training and Testing (HSTT) activities occurring within the Pacific Ocean off the coast of Southern California (SOCAL).

The Proposed Action may affect listed species that reside within the HSTT Study Area by exposing them to sound and other environmental stressors associated with training and testing activities. The enclosed HSTT Draft Environmental Impact Statement (EIS)/Overseas Environmental Impact Statement (OEIS) (Enclosure 1) is the Navy's primary document that provides the required information pursuant to 50 C.F.R. §402.12(f).

The U.S. Navy is requesting informal consultation on Alternative 1 within the HSTT Draft EIS/OEIS for species that occur within the SOCAL portion of the HSTT Study Area and are under the jurisdiction of the USFWS. Land-based activities are not part of the HSTT EIS/OEIS proposed activities. Those activities were addressed in the SOCAL and Silver Strand Training Complex (SSTC) EISs and associated biological opinions and are not proposed to change under the HSTT EIS/OEIS Proposed Action. There are no substantive changes (either in type or location) to the proposed activities in the HSTT EIS/OEIS, which is a continuation of those that were addressed under the 2013 HSTT EIS/OEIS and concurred with by USFWS. The Navy will continue to implement conservation measures identified in the biological opinions on the SSTC Operations (FWS-SDG-8B0503-09F0517) and the San Clemente Island Military Operations and Fire Management Plan (FWS-LA-09B0027-09F0040) to avoid and minimize potential adverse effects on the California least tern and western snowy plover. Also, the Navy is consulting with National Marine Fisheries Service under ESA for proposed at-sea training and testing activities that may affect ESA-listed species under its jurisdiction. Therefore, ESA-listed seabirds are the

5090
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March 15, 2018

only species being covered in this informal consultation. In addition, the enclosed Supplemental Information (Enclosure 2) serves as a roadmap for identifying the required information within the HSTT Draft EIS/OEIS.

The Navy requests concurrence that the described actions may affect, but are not likely to adversely affect the California least tern *(Sterna antillarum browni)*, short-tailed albatross *(Phoebastria albatrus)*, and marbled murrelet *(Brachyramphus marmoratus)*.

Thank you for your assistance. Please contact Kimberly O'Connor at e-mail kimberly.oconnor@navy.mil, (619) 545-9339 regarding this informal consultation request.

Sincerely,

Mary M. Foster

L. M. FOSTER
By direction

Enclosure: 1. CD-ROM of the Draft HSTT EIS/OEIS
2. HSTT ESA Consultation Supplemental Information

2

United States Department of the Interior
U.S. FISH AND WILDLIFE SERVICE
Ecological Services
Carlsbad Fish and Wildlife Office
2177 Salk Avenue, Suite 250
Carlsbad, California 92008

In Reply Refer To:
FWS-SDG-13B0130-13I0187-R001

September 14, 2018
Sent by Email

Mr. Larry M. Foster
Director, Fleet Environmental Readiness
U.S. Department of the Navy – Commander, U.S. Pacific Fleet
250 Makalapa Drive
Pearl Harbor, Hawaii 96860-3131

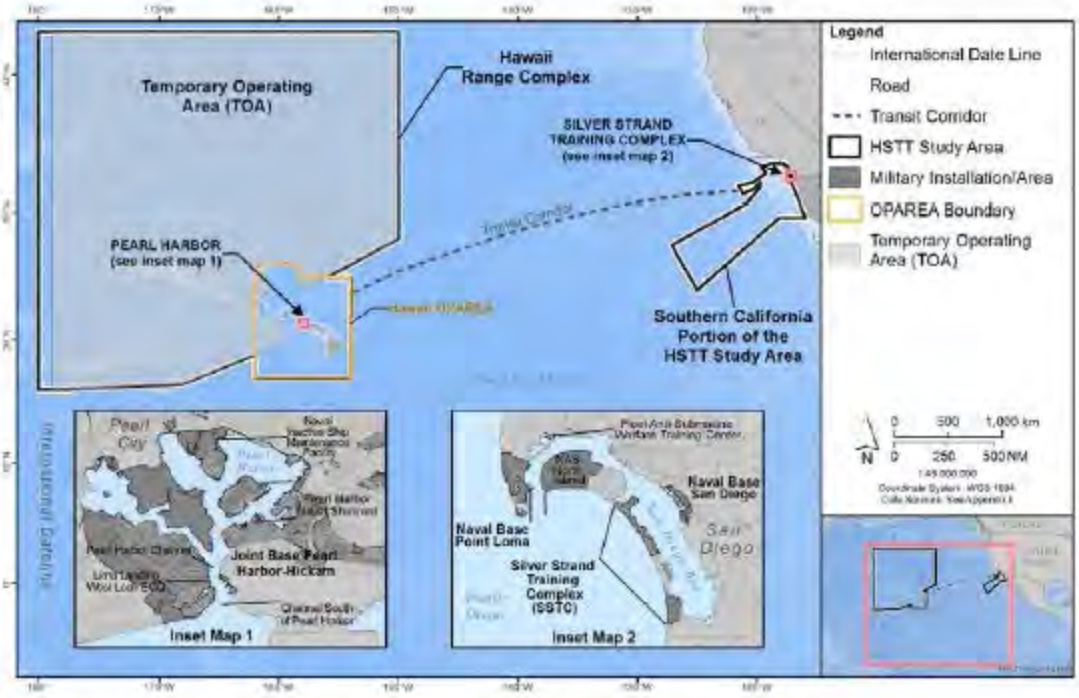
Subject: Reinitiation of Section 7 Consultation for Phase III of the U.S. Navy's Hawaii-Southern California Training and Testing

Dear Mr. Foster:

This is in response to your March 15, 2018, letter requesting informal consultation on Phase III of Hawaii-Southern California Training and Testing (HSTT Phase III), and its effects on the federally endangered California least tern (*Sternula antillarum browni*, least tern), short-tailed albatross (*Phoebastria albatrus*), and marbled murrelet (*Brachyramphus marmoratus*), in accordance with section 7 of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq*.). We previously consulted with you on HSTT Phase II from 2013 to 2018 (FWS-SDG-13B0130-13I0187), and concurred with your determination that the identified testing and training was not likely to adversely affect the least tern, short-tailed albatross, and marbled murrelet.

HSTT Phase III will continue in the same area as HSST Phase II, and includes U.S. Navy (Navy) operating and warning areas across the north-central Pacific Ocean under the jurisdiction of the U.S. Fish and Wildlife Service's (Service) Pacific Islands Fish and Wildlife Office and Carlsbad Fish and Wildlife Office (CFWO) (Figure 1). This letter addresses only the portions of HSTT Phase III under the CWFO's jurisdiction.

HSTT Phase III includes training and testing at the Southern California (SOCAL) Range Complex (including San Clemente Island) and Silver Strand Training Complex (SSTC) within the CFWO's jurisdiction that were already addressed in biological opinions FWS-LA-09B0027-09F0040 (2008 biological opinion) and FWS-SDG-8B0503-09F0517 (2010 biological opinion), respectively. Any changes to training and testing and their potential effects to federally listed species at San Clemente Island and SSTC will be addressed by amendment to the 2008 and 2010 biological opinions (Booker 2018, pers. comm.).



Notes: HSTT: Hawaii-Southern California Training and Testing, NAS: Naval Air Station

Figure 1. HSTT Phase III Action Area. *Source: Navy 2017*

HSTT Phase III will be implemented as described in Alternative 1 of the 2017 HSTT Draft Environmental Impact Statement/Overseas Environmental Impact Statement (DEIS/OEIS; Navy 2017). HSTT Phase III will occur throughout the year, and include: use of active sonar, lasers, electromagnetic equipment, radar, and explosives in the existing complexes; sonar maintenance and gunnery exercises during vessel transits between the complexes; and vessel transit, sonar testing, and anti-terrorism patrols in San Diego Bay, California.

HSTT Phase III will generally include the same training platforms, weapons and systems used for HSTT Phase II, and will continue into the reasonably foreseeable future to meet military readiness requirements. Changes from HSTT Phase II have been made to the organization of vessels, weapons, and activities, resulting in changes in the frequency and organization of testing and training activities. In the future, HSTT Phase III will likely also include new aircraft, vessels, unmanned/autonomous systems, and weapon systems that will be introduced to the fleets after December 2018. The Navy has quantified the likely number and duration of training and testing cycles that could occur over each 5-year period to account for the fluctuation of cycles and deployment schedules that generally limit the maximum level of training and testing from occurring on a sustained basis. Overall, the Navy is expecting a net increase in the need to test systems that use sonar and a net decrease in explosives use, compared to that analyzed under HSTT Phase II.

California least tern

The least tern is a small migratory seabird, which nests at coastal sites in California, United States, and Baja California, Mexico. They forage in bays, estuaries, and the nearshore and offshore waters

of the Pacific Ocean. To obtain prey (small-narrow bodied fish), least terns hover above, and then dive into the top few feet of the water surface, spending little time underwater. After the nesting season, least terns migrate to the south, likely to wintering ranges off the coast of southern Mexico and Central America (Service 2014). The least tern is present within the action area primarily in San Diego Bay, in nearshore waters (less than 1 mile) off the coast of San Diego, and in offshore upwelling areas such as Nine Mile Bank and Colorado Canyon up to 14 miles offshore in the Pacific Ocean (Baird 2010). Least terns may forage or rest on the bay and/or ocean surface in these areas. Their presence in specific areas is intermittent and dependent upon the location and availability of prey.

Short-tailed albatross

The short-tailed albatross is a seabird that spends most of its life at sea, and ranges throughout the North Pacific Ocean. Short-tailed albatross nest in two currently extant colonies: Torishima Island, Japan; and Minami-kojima in the Senkaku Islands off Taiwan. An estimated 12 percent of the population occurs annually within the California Current System, the majority of which are males and juveniles (Suryan *et al.* 2008), however only 14 observations of short-tailed albatross have been reported in southern California since 2005 (Navy 2017). When feeding, short-tailed albatross alight upon the ocean surface and seize their prey, including squid, fish, and shrimp.

Marbled murrelet

The marbled murrelet is a small seabird found in the Pacific coastal waters from Alaska through central California and occasionally off southern California during the winter. Marbled murrelets nest in coniferous trees near the coast in northern California, Washington, and Oregon. Marbled murrelets are often observed in shallow water within 1 mile of shore, and are only rarely encountered at sea farther than 3 miles from shore. Marbled murrelets have been reported infrequently in the action area (Ruizcampos 2013; Erickson *et al.* 1994; Handa, 2014).

HSTT Phase III could impact least terns, short-tailed albatross, and marbled murrelets, particularly if individuals or groups of birds are in close proximity to vessels or aircraft during, or in transit to, training and testing (Navy 2017). The potential impacts are described in the DEIS/DOEIS, and include: acoustic impacts (both under and above the water); impacts from explosives and energy generating equipment (e.g. electromagnetic generator or laser); ingestion or entanglement in materials left in the water after training activities (e.g. parachutes, cables, expended rounds); and collisions with vessels and planes.

In addition to training already addressed in the 2010 biological opinion, HSTT Phase III in San Diego Bay where least terns may forage will include vessel transit, and sonar maintenance and pier-side sonar testing. Vessels in transit within San Diego Bay adhere to a speed limit and remain within the channel that is centrally located within the bay, while most reported observations of least terns foraging in San Diego Bay are near the periphery of the bay, outside the channel (Baird 2010). We have received no reports of collisions between least terns and vessels, and consider the potential for collisions in San Diego Bay discountable. Sonar maintenance and pier-side testing within San Diego Bay would also be unlikely to affect least terns, since least terns spend little time submerged during foraging.

Mr. Larry M. Foster (FWS-SDG-13B0130-13I0187-R001) 4

Least terns, short-tailed albatross, and marbled murrelets in nearshore/offshore waters of the Pacific Ocean may also be exposed to HSTT Phase III. Based upon the low density, mobility, and intermittent presence, it is unlikely for these species to be present during HSTT Phase III. If present, least terns and short-tailed albatross have limited potential for exposure to underwater acoustic stressors, since they only briefly (least terns) or do not (short-tailed albatross) submerge during foraging. While they do submerge when foraging, again the potential for marbled murrelets to be within the vicinity testing and training is very low and we consider the potential for impacts discountable. Expended materials are designed to sink (Navy 2017), thus they remain on the surface for a short time, which reduces the potential for exposure that could lead to entanglement or ingestion. While it is possible for their path to intersect with that of a Navy vessel in transit or while conducting testing and training, the potential is sufficiently low that we expect adverse effects to least terns, short-tailed albatross, and marbled murrelets to be unlikely, and therefore also discountable.

Based on the above, we concur with the Navy's determination that HSTT Phase III is not likely to adversely affect the least tern, short-tailed albatross and marbled murrelets. Therefore, the interagency consultation requirements of section 7 of the Act have been satisfied. Should project plans change or if additional information on the distribution of listed or proposed species becomes available, this determination may be reconsidered and further section 7 consultation may be required.

We appreciate your continued efforts to address the conservation needs of wildlife that may be affected by military training and testing. If you have any questions or concerns with regard to this consultation, please contact Sandy Vissman at 760-431-9440.

Sincerely,



for Karen A. Goebel
Assistant Field Supervisor

cc:
Aaron Nadig, Honolulu Fish and Wildlife Office

LITERATURE CITED

Baird, P. 2010. Foraging Study of California Least Terns in San Diego Bay and Near Ocean Waters, San Diego California. Unpubl. Rept. U.S. NAVFACENGCOM, San Diego. 52 pages.

Erickson, R.A., R.A. Hamilton, S.N.G. Howell, P. Pyle, M.A. Patten. 1994. First record of the marbled murrelet, and third record of the ancient murrelet for Mexico. https://www.birdpop.org/docs/pubs/Erickson_et_al_1995_First_Record_of_MAMU_and_Third_Record_of_ANMU_in_Mexico.pdf

Handa, L. 2014. Observation of marbled murrelet in Mission Bay, San Diego, California. Birding in California and Beyond with Gary Nunn. http://www.sandiegobirding.com/?p=4667

Ruizcampos, G. 2013. Annotated Checklist of the Birds of Baja California and Baja California Sur, Second Edition. https://www.researchgate.net/publication/262918595_Annotated_Checklist_of_the_Birds_of_Baja_California_and_Baja_California_Sur_Second_Edition

Suryan, R.M., D.J. Anderson, S.A. Shaffer, D.D. Roby, Y. Tremblay, D.P. Costa, and N. Nakamura. 2008. Wind, waves, and wing loading—Morphological specialization may limit range expansion of endangered albatrosses: PloS One, v. 3, no. 12, p. e4016, doi:10.1371/journal.pone.04016.

[Navy] U.S. Department of the Navy. 2017. Hawaii-Southern California Training and Testing Draft Environmental Impact Statement/Overseas Environmental Impact Statement.

[Service] U.S. Fish and Wildlife Service. 2014. California Least Tern (*Sternula antillarum browni*) 2014 Species Review. Carlsbad Fish and Wildlife Office Carlsbad, CA. 75 pages.

Personal communications:

Booker, M. 2018. Discussion with San Clemente Island Wildlife Biologist pertaining to approach for future coordination on activities on training activities at San Clemente Island and Silver Strand Training Complex. August 28, 2018.

J.3.2 HAWAII

DEPARTMENT OF THE NAVY
COMMANDER
UNITED STATES PACIFIC FLEET
250 MAKALAPA DRIVE
PEARL HARBOR, HAWAII 96860-3131

IN REPLY REFER TO:
5090
Ser N465/0561
April 05, 2018

Dr. Mary Abrams
Field Supervisor
Pacific Islands Fish and Wildlife Office
300 Ala Moana Blvd., Suite 3-122
Honolulu, Hawaii 96850

Dear Dr. Abrams:

SUBJECT: REQUEST FOR INFORMAL CONSULTATION UNDER SECTON 7 OF THE ENDANGERED SPECIS ACT FOR PROPOSED MILITARY READINESS ACTIVITIES IN THE HAWAII RANGE COMPLEX

In accordance with section 7 of the Endangered Species Act (ESA), the U.S. Navy (Navy) requests informal consultation on proposed Hawaii-Southern California Training and Testing (HSTT) activities occurring within the Pacific Ocean in the surrounding waters of the Hawaiian Islands.

The Proposed Action may affect listed species that reside within the HSTT Study Area by exposing them to sound and other environmental stressors associated with training and testing activities. The enclosed HSTT Draft Environmental Impact Statement (EIS)/ Overseas Environmental Impact Statement (OEIS) (Enclosure 1) is the Navy's primary document that provides the required information pursuant to 50 C.F.R. §402.12(f).

The Navy is requesting informal consultation on Alternative 1 of the HSTT Draft EIS/OEIS for species that occur within the Hawaii Range Complex and are under the jurisdiction of the USFWS. Land-based activities are not part of the HSTT EIS/OEIS proposed activities. Those activities were covered in the 2008 Hawaii Range Complex (HRC) EIS/OEIS (Enclosure 2) and are not proposed to change under the HSTT EIS/OEIS Proposed Action. There are no substantive changes (either in type or location) to the proposed activities in the HSTT EIS/OEIS, which is a continuation of those that were addressed under the 2013 HSTT EIS. The enclosed Supplemental Information (Enclosure 3 and Enclosure 4) serves as a roadmap for identifying information relative to the consultation within the HSTT Draft EIS/OEIS as well as providing amplifying information for this consultation.

The Navy's analysis in the Draft HSTT EIS/OEIS indicates that ESA-listed seabirds may be affected by Navy training and testing activities while at sea. Additionally, since the 2008 consultation (HRC informal consultation letter of concurrence, USFWS 2008), green sea turtle nesting has been observed at the Pacific Missile Range Facility (PMRF) where amphibious

5090
Ser N465/0561
April 5, 2018

beach landings may occur. Olive ridley and hawksbill sea turtles have not been documented as nesting at PMRF, however, since they have been observed (albeit infrequently) at other locations within the HRC, the Navy requests informal consultation for the effect of amphibious landings on all three sea turtle species.

The Navy requests concurrence that the described actions may affect, but are not likely to adversely affect the Hawaiian petrel (Pterodroma sandwichensis), short-tailed albatross (Phoebastria albatrus), Newell's shearwater (Puffinus auricularis newelli), band-rumped storm-petrel (Oceanodroma hydrobates castro), green sea turtle (Chelonia mydas), hawksbill sea turtle (Eretmochelys imbricate) and the olive ridley sea turtle (Lepidochelys olivacea). The Navy is also consulting with National Marine Fisheries Service under ESA for proposed at-sea training and testing activities that may affect ESA-listed species under its jurisdiction.

Thank you for your assistance. Please contact Ms. Julie Rivers of my staff at email: julie.rivers@navy.mil, (808) 474-6391 regarding this informal consultation request or Dr. Frans Juola at Naval Facilities Engineering Command, Pacific at email: frans.juola@navy.mil, (808) 472-1433.

Sincerely,

L. M. FOSTER
By direction

Enclosures:
1. CD-ROM of the Draft HSTT EIS/OEIS
2. CD-ROM of the 2008 HRC Final EIS/OEIS
3. Supplemental Information for Species under USFWS Jurisdiction within the HRC
4. Supplemental Information specific to sea turtle activity in terrestrial environments within the HRC

2

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Pacific Islands Fish and Wildlife Office
300 Ala Moana Boulevard, Room 3-122
Honolulu, Hawai'i 96850

In Reply Refer To:
01EPIF00-2018-I-0178

MAY 10 2018

Mr. Larry M. Foster
Department of the Navy
United States Pacific Fleet
250 Makalapa Drive
Pearl Harbor, HI 96860-3131

Subject: Informal Consultation on the U.S. Navy's Proposed Military Readiness Activities in the Hawaii Range Complex

Dear Mr. Foster:

This letter is in response to your April 5, 2018, letter requesting informal consultation on the proposed U.S. Navy Hawaii-Southern California Training (HSTT) activities occurring in waters off of the Hawaiian Islands, and land-based activities at the Pacific Missile Range Facility (PMRF), Kauai, Hawaii pursuant to the Endangered Species Act (ESA), as amended. We received your letter on April 12, 2018. You determined the proposed action may affect, but is not likely to adversely affect the federally endangered short-tailed albatross (*Phoebastria albatrus*), Hawaiian petrel (*Pterodroma sandwichensis*), band-rumped storm petrel – Hawaii Distinct Population Segment (DPS) (*Oceanodroma castro*), and the threatened Newell's shearwater (*Puffinus auricularis newelli*). You also requested our concurrence with your determination that the proposed land-based activities are not likely to adversely affect the federally endangered hawksbill sea turtle (*Eretmochlys imbricata*), the threatened green sea turtle North Central Pacific DPS (*Chelonia mydas*) and olive ridley sea turtle (*Lepidochelys olivacea*).

HSTT activities will be implemented as described in Alternative 1 of the 2017 HSTT Draft Environmental Impact Statement/Overseas Environmental Impact Statement (DEIS/OEIS) (Navy 2017) and Supplemental Information provided in your request. The HSTT action area includes established U.S. Navy (Navy) operating and warning areas across the north-central Pacific Ocean, from Southern California west to Hawaii and the International Date Line (Figure 1). The DEIS/OEIS Study Area includes three existing Navy range complexes: the Hawaii Range Complex, SOCAL Range Complex, and Silver Strand Training Complex (SSTC). The HSTT action area also includes Navy vessel transit corridors and piers outside of the range complexes. HSTT will include: use of active sonar and explosives in existing range complexes: sonar maintenance and gunnery exercises during ship transits between the range complexes; sonar testing at Navy piers in Pearl Harbor, Hawaii, and San Diego Bay, California. HSTT training and testing activities may occur year round.

Mr. Larry M. Foster 2

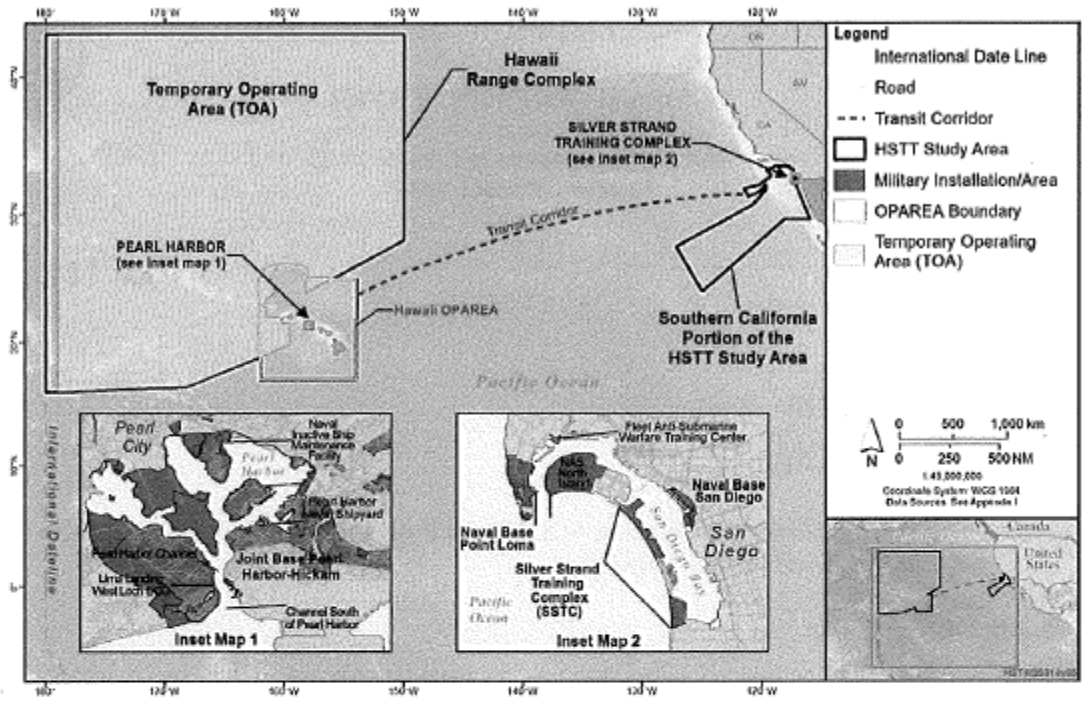


Figure 1: Hawaii-Southern California Training and Testing Study Area (from Supplemental Information provided in April 2, 2018, letter)

Land-based activities will be implemented as described in the 2008 Hawaii Range Complex (HRC) EIS/OEIS (Navy 2008) and Supplemental Information provided in your request. Land-based activities consist of Expeditionary Assault Training events which include approach and landing on beach areas by amphibious landing craft and vehicles, operation of support aircraft, personnel movement across and use of shoreline areas. Land-based activities will primarily occur at Majors Bay, PMRF, Kauai; and may also occur at Marine Corps Base Hawaii, Oahu; Marine Corps Training Area Bellows (MCTAB); and K-Pier boat ramp, Kawaihae, Hawaii. Land-based activities are restricted to specific areas of designated beaches at these locations. A maximum of 12 amphibious beach landings per year is proposed. This consultation addresses only the proposed land-based activities at PMRF.

Federally Listed Seabirds

It is likely that few seabirds would be affected by sonar and other underwater acoustic sources because sources are used intermittently during a training event, training events are dispersed in space and time, most seabirds spend little time submerged, and exposures sufficiently intense (i.e., of a certain duration or within close proximity) to cause physiological impacts are unlikely. Hawaiian petrels, short-tailed albatrosses, and band-rumped storm petrels do not submerge while foraging; therefore, they would not be exposed to underwater sound from sonar and other active acoustic sources. Newell's shearwater may briefly submerge while foraging, pursuit diving, so

there is a remote chance that these species could be exposed to underwater sound sonar and other active acoustic sources.

The short-tailed albatross, Hawaiian petrel, Newell's shearwater, and band-rumped storm petrel occur in oceanic and off shore waters within the HSTT action area at low frequencies. HSTT activities could result in an adverse effect to these species. Due to the widely dispersed, temporary, and intermittent nature of the HSTT activities, and the low frequency of these species within the HSTT action area, we consider such effects to the short-tailed albatross, Hawaiian petrel, Newell's shearwater, and band-rumped storm petrel possible, but unlikely to occur, so the effects would be considered discountable. Therefore, we concur with the Navy's determination that implementation of the HSTT may affect, but is not likely to adversely affect the four listed seabirds.

Federally Listed Turtles

Green sea turtles are known to utilize terrestrial environments at PMRF for nesting and basking (Figure 2). Olive ridley and hawksbill turtles have not been documented at PMRF, but have been infrequently observed at other locations within the Hawaii Range Complex.

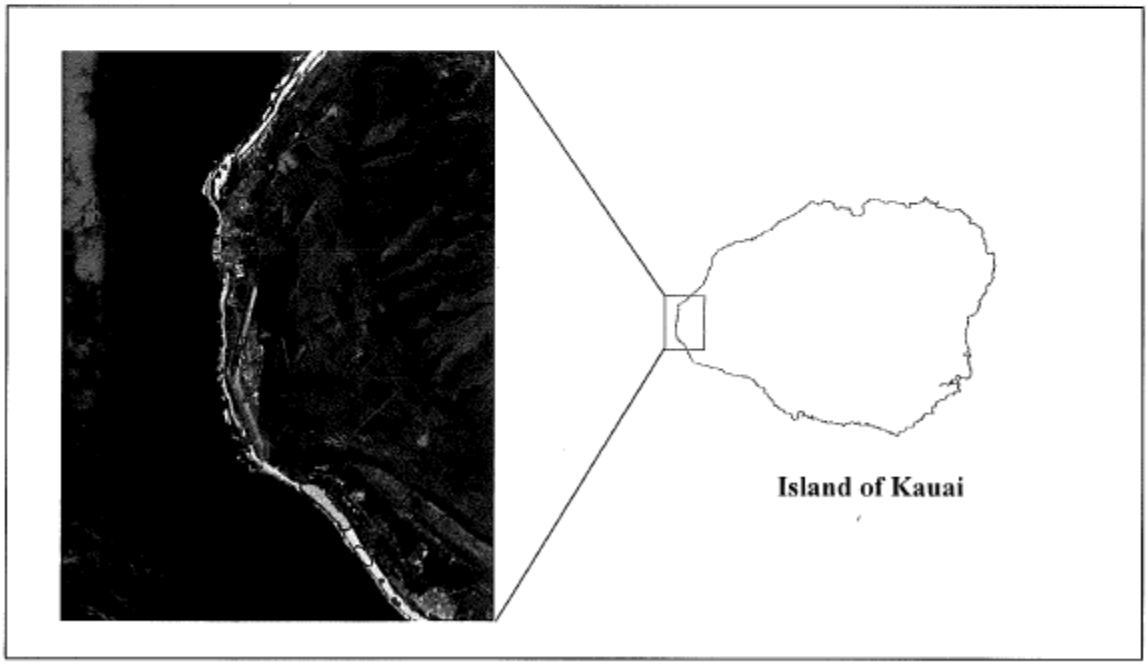


Figure 2: PMRF Main Base, Kauai. Red dots indicate known nesting sites for green sea turtles from 2010 – 2017. Open circles represent known turtle foraging and basking areas. Highlighted region represents the location at Major's Bay where all amphibious beach landing occurs (from Supplemental Information provided in Navy's April 2, 2018, letter).

Land-based Expeditionary Assault Training events at PMRF could result in adverse effects to listed sea turtles in the form of direct physical disturbance to adult turtles, nests, eggs, or hatchlings by land crafts and/or personnel coming ashore. To avoid impacts to the green sea turtle during training events, the Navy will implement the following avoidance and minimization measures as described in the Supplemental Information:

- Amphibious beach landings at PMRF take place only on specific routes at Major's Bay in order to minimize impacts on coral, terrestrial and marine resources. The area of Major's Bay used for beach landing training is not a higher-use area for sea turtles (Figure 2).

- Within 1 hour prior to initiation of amphibious beach landing activities, landing routes and beach areas are surveyed for the presence of sensitive wildlife. If any marine mammals or sea turtles are found to be present on the beach, the training is delayed as long as necessary until the animals voluntarily leave the area.

- PMRF Natural Resources (NR) staff survey PMRF beaches 1-2 times per week searching for any sign of turtle activity (tracks, digs, nests) and monitor existing turtle nests.

- PMRF security forces patrol the PMRF beaches by vehicle, daily. They are trained specifically by NR staff to look for signs of turtle activity. Any such activity is reported to NR staff immediately. They are also instructed to drive below the high tide line and to avoid sand dunes and beach vegetation, areas where turtle nests are more likely to be located.

- Newly discovered nests are marked with flagging and protected from access by NR staff by placing a temporary exclosure fence around them. The fence is constructed with poles and orange plastic mesh.

- Hatched nests are searched and excavated to remove additional hatchlings once all visible hatchlings have emerged.

- Surveys are conducted daily around the Nohili ditch outfall. Adult sea turtles are rescued if any become stranded (strandings are rare, but can occur in this area behind the naturally exposed compressed-carbonate rock that stretches along the beach. Turtles are not able to climb over the rock but in almost all cases do return to the ocean via the ditch outfall opening).

- Measures are implemented to avoid light attraction, confusing adult turtles or hatchlings. Additionally, conservation measures to reduce artificial night lighting have been implemented base-wide with minimal exceptions granted for safety reasons (PMRF Basewide Biological Opinion (BO), 2014).

- Only animals on leashes are allowed on the beach at Barking Sands. Leash laws for residents are enforced by the PMRF Security patrols, and all non-residents, whether PMRF employees or recreational pass holders, or guests, are stopped at the gate and not allowed to enter with dogs.

- Vehicle access restrictions implemented in 2001 to 75 percent of the Barking Sands beachfront has resulted in observable recovery of beach and strand vegetation. Only base security is allowed to drive on the beaches and the drivers of those vehicles utilize established paths to access the beach.

- The Navy voluntarily participates in beach cleanups at Barking Sands. The removal of marine debris from PMRF's beaches, including fishing nets, reduces the risk of entanglement to green sea turtle adults, and hatchlings.

Based on the above and implementation of mitigation and avoidance and minimization measures outlined in detail within the Navy's 2017 DEIS/OEIS and Supplemental Information, we concur with the Navy's determination that implementation of the HSTT may affect, but is not likely to adversely affect the three ESA-listed turtle species.

We appreciate your continued efforts to address the conservation needs of wildlife that may be affected by military training activities. If you have questions regarding these comments, please contact James Kwon, Fish and Wildlife Biologist (phone: 808-792-9400, email: james_kwon@fws.gov).

Sincerely,

DARREN LEBLANC Digitally signed by DARREN LEBLANC Date: 2018.05.10 11:53:50 -10'00'

Mary M. Abrams, Ph.D.
Field Supervisor

Enclosure

Navy Request for Concurrence with Determination of Affects for HSTT and Land-based Activities

Scientific Name	Common Name	Federal Status*	Navy Determination	Service Concurrence
Reptiles				
Chelonia mydas	Green sea turtle Central North Pacific DPS	T	NLAA**	Yes
Erectmochelys imbricata	Hawksbill sea turtle	E	NLAA	Yes
Lepidochelys olivacea	Olive ridley sea turtle	T	NLAA	Yes
Birds				
Oceanodroma castro	Band-rumped storm-petrel – Hawaii DPS	E	NLAA	Yes
Phoebastria albatrus	Short-tailed albatross	E	NLAA	Yes
Pterodroma sandwichensis	Hawaiian petrel	E	NLAA	Yes
Puffinus auricularis newelli	Newell's shearwater	T	NLAA	Yes

***E = Endangered, T = Threatened**
****May affect, not likely to adversely affect**

J.4 MAGNUSON-STEVENS FISHERY CONSERVATION AND MANAGEMENT ACT

J.4.1 CALIFORNIA

DEPARTMENT OF THE NAVY
COMMANDER
UNITED STATES PACIFIC FLEET
250 MAKALAPA DRIVE
PEARL HARBOR, HAWAII 96860-3131

IN REPLY REFER TO:
5090
Ser N465/0611
April 17, 2018

Mr. Eric Chavez
Habitat Conservation Division
National Marine Fisheries Service, Southwest Regional Office
501 West Ocean Blvd., Suite 4200
Long Beach, CA 90802

Dear Mr. Chavez:

SUBJECT: ESSENTIAL FISH HABITAT IN THE HAWAII-SOUTHERN CALIFORNIA TRAINING AND TESTING STUDY AREA

This letter provides the National Marine Fisheries Service (NMFS) with information concerning the U.S. Navy's continuation of training and testing activities analyzed in the 2013 Hawaii-Southern California Training and Testing (HSTT) Environmental Impact Statement/Overseas Environmental Impact Statement (EIS/OEIS) which was the subject of consultations with NMFS concluding in April 2013. The Navy previously prepared an Essential Fish Habitat Assessment (EFHA) covering potential impacts of Navy activities on designated EFH areas within the HSTT Study Area in accordance with the Magnuson-Stevens Fisheries Conservation and Management Act of 1976, Public Law 94-265 as amended through October 11, 1996, section 305 (b) (2) and 50 C.F.R 600.92.

Currently, the Navy is preparing an updated EIS/OEIS (Phase III) to cover activities beginning in December 2018 and into the foreseeable future, using new information available after the release of the 2013 HSTT EIS/OEIS (Phase II). As discussed in Enclosure 1, there are no significant changes to actual activities, geographic parameters or levels of activities occurring in areas previously subject to consultation with NMFS, or to designated EFH areas in the HSTT Study Area that would alter the conclusions from the 2013 EFHA or affect the basis for NMFS' EFH Conservation Recommendations. Consequently, the Navy's previous analysis of impacts to EFH within the HSTT Study Area remains adequate and does not raise the requirement of supplemental consultation pursuant to 50 C.F.R. 600.920 (1). Therefore, the Navy is not requesting to reinitiate consultation at this time.

If you need additional information or have questions, please feel free to contact Mr. Chip Johnson at (619) 767-1567 or chip.johnson@navy.mil. The 2017 Draft HSTT EIS/OEIS is available at: www.HSTTEIS.com.

Sincerely,

L. M. Foster
By direction

Enclosures: 1. HSTT Phase II/Phase III EFH Comparison Analysis

Copy to: (w/enclosures)
Dr. Kelly Ebert, Chief of Naval Operations (N454)
Mr. Gerry Davis, NMFS Habitat Conservation Division, Pacific Islands Regional Office

Macariola-See, Nora R CIV NAVFAC PAC

From: Johnson, Chip CIV COMPACFLT, N465CJ
Sent: Wednesday, August 22, 2018 12:31 PM
To: Eric Chavez
Cc: Stone, Alexander CIV COMPACFLT, N465AS; Van Name, John P CIV COMPACFLT, N465JV; Scott, Cory L CIV WD, 52F00ME
Subject: Navy submission of HSTT additional material and request to consult

Eric,

Thank you for taking time on August 2nd to discuss our letter dated April 17th 2018. As you are aware from our letter dated April 17th, the Navy did not request supplemental consultation under EFH for our updated HSTT EIS/OEIS (Phase III). The Navy's position is that the activities proposed for HSTT Phase III are substantially the same as HSTT Phase II in which we prepared a EFHA and concluded the consultation in April 2013.

Although the Navy does not believe that the activities we propose for Phase III substantially revise our Phase II plans in a manner that may adversely affect EFH, and thus mandating supplemental consultation, we do recognize and appreciate the value of gaining NMFS concurrence on the issue of EFH. It is with that objective in mind that the Navy is now providing your office with a package of additional information and requesting to initiate supplemental EFH to support HSTT Phase III. Specifically, we are requesting to initiate consultation on the changes in seafloor devices, underwater detonation changes, changes in "bin" definitions.

The Navy's attached HSTT EFH package contains material is tailored specifically to key issues NMFS West Coast Region requested additional information on during the August 2nd discussion. As an added note, during the Navy's August 2018 review of the HSTT EIS/OEIS for seafloor devices, it was discovered that the values for training and testing activities using seafloor devices as well as associated quantities of seafloor devices were incorrect. Actual quantities the Navy proposes is significantly lower than those listed in the HSTT draft EIS/OEIS. These have been corrected in the attached and the Navy is working on revising the HSTT final EIS/OEIS.

We would like to emphasize that Navy policy requires regulatory processes, including EFH consultations, be completed prior to the publication of the Final HSTT EIS/OEIS, which will occur in mid-October 2018. Therefore, we are requesting your support in completing your review of the supplemental consultation package by early October 2018.

Chip Johnson
U.S. Pacific Fleet, Environmental Readiness Division (N465), San Diego Detachment
Office: (619) 767-1567
Email: chip.johnson@navy.mil

1

Macariola-See, Nora R CIV NAVFAC PAC

-----Original Message-----
From: Eric Chavez - NOAA Federal <eric.chavez@noaa.gov>
Sent: Wednesday, October 03, 2018 3:18 PM
To: Johnson, Chip CIV COMPACFLT, N465CJ <chip.johnson@navy.mil>
Cc: Stone, Alexander CIV COMPACFLT, N465AS <alexander.stone@navy.mil>; Van Name, John P CIV COMPACFLT, N465JV <john.vanname@navy.mil>; Scott, Cory L CIV WD, 52F00ME <cory.l.scott@navy.mil>; Ian Lundgren - NOAA Federal <ian.lundgren@noaa.gov>
Subject: Re: [Non-DoD Source] Re: Navy submission of HSTT additional material and request to consult

Hello,

NOAA's National Marine Fisheries Service (NMFS) West Coast Region (WCR) received a letter from the U.S. Department of the Navy (Navy) regarding Phase 3 of the Hawaii-Southern California Training and Testing [(HSTT); proposed project], which included an enclosure entitled, "HSTT Phase II/Phase III EFH Comparison Analysis (Comparison Analysis), on May 2, 2018. The letter referenced the Environmental Impact Statement/Overseas Environmental Impact Statement (EIS/OIES), and the Navy's conclusion that their previous analysis of impacts to EFH within the HSTT Study Area was adequate and a supplemental EFH consultation was not warranted. As we've noted previously, we'd like to underscore the importance of early coordination between the Navy and NMFS to identify any procedural or resource conservation issues early on to facilitate an effective and timely environmental review process.

Following our review of the Navy's letter and Comparison Analysis, and coordination with other NMFS staff, a conference call was held between the Navy and NMFS WCR on August 2, 2018. During that call we conveyed our position that an EFH consultation was warranted and requested supplemental information we required to initiate EFH consultation. The information we requested pertained to a number of issues, including explosives, seafloor devices, acoustic stressors, updated information on Pacific Coast Groundfish EFH and deep sea corals, habitat mapping data, implementation of relevant EFH Conservation Recommendations provided previously, and cumulative effects analyses. Subsequent to that conference call, the Navy provided a supplemental package of information on August 22, 2018, which included an "HSTT SOCAL EFH supplement," along with a number of other documents, and requested initiation of EFH consultation. In addition, the Navy identified early October as the target date for completing the EFH consultation to accommodate their timeline for completing the Final Phase 3 EIS/OEIS. After reviewing the information related to EFH for Phase 3 of the Navy's HSTT, including the Comparison Analysis, HSTT SOCAL EFH supplement, HSTT Phase 2 EFH Assessment, Phase 3 EIS/OEIS, as well as other related information, NMFS WCR identified additional information required to complete the consultation and relayed that via telephone on September 21, 2018. The Navy responded to that request on October 1, 2018 with a memorandum for the record, and another conference call between the Navy and NMFS was held on October 2, 2018. Having reviewed all of the above information, we offer the following comments pursuant to section 305(b)(4)(A) of the Magnuson-Stevens Fishery Conservation and Management Act (MSA).

The proposed project is to conduct a variety of military training activities throughout the in-water areas off the coast of southern California, at Navy pierside locations, in the transit corridor between Hawaii and Southern California, and around the Hawaiian Islands. As agreed to previously with the Navy, NMFS WCR will focus this consultation primarily on those activities occurring within the Southern California region, including the Southern California (SOCAL) Range Complex Study Area and Silver Strand Training Complex (SSTC), and to some extent, the transit corridor. Situated between Dana Point and San Diego, the SOCAL Range Complex Study Area extends more than 600 nautical miles (nm) southwest into the Pacific Ocean and covers approximately 120,000 nm2 of sea space. The SSTC is an integrated set of training areas located on and adjacent to the Silver Strand, a narrow isthmus separating San Diego Bay from the Pacific Ocean. Although not part of any defined range complex, the transit corridor provides adequate air, sea, and undersea space to conduct training and some sonar maintenance and testing while en route between southern California and

1

Hawaii. Those activities that occur within the Hawaii Range Complex Study Area are being addressed in a separate EFH consultation between the Navy and NMFS Pacific Islands Regional Office.

The proposed project includes the detonation of underwater explosives; weapons firing; the use of active sonar; acoustics and electromagnetic devices; pile driving; deployment of seafloor devices and other in-water devices (e.g., remotely operated vehicles); vessel movement; and ship to shore transport of personnel, equipment and supplies. Construction of an elevated causeway system (ELCAS), which requires the driving of steel piles, could occur at the following locations in order of preference/likelihood: Camp Pendleton nearshore, SSTC nearshore, Bravo Beach in San Diego Bay. Sonar maintenance and gunnery exercises may also be conducted concurrently with ship transits that may occur outside the geographic boundaries of Navy range complexes. Relative to Phase 2, Phase 3 includes more detailed location information for certain activities (e.g., specifying SSTC instead of SOCAL Range Complex), the addition of broadband and low frequency acoustic source classes (e.g., sound source bins), new activities (e.g., testing of new platforms; maritime security operations, such as drug interdiction and anti-piracy operations), and decreases in some activities (e.g., sinking and other training exercises).

The proposed project occurs within EFH for various federally managed fish species within the Coastal Pelagic Species, Pacific Coast Groundfish, and Highly Migratory Species Fishery Management Plans (FMPs). In addition, the proposed project occurs within estuarine habitat and in the vicinity of seagrass (e.g., eelgrass, surfgrass), rocky reef, and kelp habitat, which have been identified as habitat areas of particular concern (HAPC) under the Pacific Coast Groundfish FMP. Designated HAPC are not afforded any additional regulatory protection under MSA; however, Federal projects with potential adverse impacts to HAPC will be more carefully scrutinized during the consultation process.

The proposed project would adversely affect EFH as a result of acoustic stressors (e.g., sonar, explosives, pile driving), electromagnetic devices, direct physical disturbance [e.g., vessels, seafloor devices, military expended materials (MEM), pile driving], and contaminants (explosives and byproducts, metals, other chemicals and materials). Impacts associated with these activities would range substantially and would include potential habitat loss or conversion, physical injury or mortality, modifications in fish behavior, and increased turbidity. The duration of these impacts would also be expected to range from temporary to permanent. However, many of the activities associated with the HSTT project have been addressed through extensive coordination between NMFS and the Navy during this and previous EFH consultations for the SOCAL Range Complex and SSTC. Based on the information provided by the Navy and identified above, the Navy will implement conservation measures to avoid or minimize impacts to EFH from this project. For instance, the Navy performed benthic habitat mapping surveys throughout much of the SSTC and the San Clemente Island region. Data collected from these surveys will continue to be used by the Navy to avoid impacts to sensitive habitats (e.g., seagrass, understory algal communities, kelp, rocky reefs, sea fans or sea palms, etc.) to the greatest extent practicable when conducting bottom or near-bottom underwater demolition exercises or other activities that may impact bottom habitat. In addition, the detonation of any explosives larger than approximately 0.033 pounds net explosive weight will occur outside of San Diego Bay in the nearshore environment over sandy bottom. Given the potential additive, and even synergistic, effects of ongoing impacts associated with MEM, the Navy agreed to refine existing data collection tools to track and calculate actual MEM usage as much as possible, incorporate that information into more realistic impact assessments in the future, and coordinate with NMFS and other partners to improve cumulative impact analyses for MEM (e.g., deposition and decomposition rates, total material loads being discharged in association with HSTT activities). This information will help us better understand any impacts to habitat functions and whether additional conservation or offsetting measures are warranted. Construction of an ELCAS in San Diego Bay, which is unlikely but not completely discountable, would be limited in scope (i.e., 1-3 sections requiring 4-12 piles total) and duration (approximately 5 days). In addition, if an ELCAS is to be constructed within the bay, the Navy has committed to coordinate with NMFS WCR prior to construction, and conduct pre- and post-construction eelgrass surveys in accordance with the California Eelgrass Mitigation Policy. Moreover, although such an activity would only be expected to impact a small amount of eelgrass habitat (roughly .0006 acre) in the designated training lane within Bravo Beach, the Navy plans to mitigate for the full extent of eelgrass habitat occurring there (roughly 1.13 acres). Finally, the Navy will conduct a study to assess the effects of underwater explosions on fish, focusing on physiological effects (e.g., mortality, injury, hearing impacts) that should inform future consultations. Therefore, NMFS believes the proposed conservation measures are sufficient to avoid, minimize or offset impacts to EFH and has no additional EFH Conservation

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Recommendations to provide at this time. This response completes your EFH consultation requirements. Thank you for consulting with NMFS.

Regards,

Eric

J.4.2 HAWAII

DEPARTMENT OF THE NAVY
COMMANDER
UNITED STATES PACIFIC FLEET
250 MAKALAPA DRIVE
PEARL HARBOR, HAWAII 96860-3131

IN REPLY REFER TO:
5090
Ser N465/0612
April 17, 2018

Mr. Gerry Davis
Habitat Conservation Division
National Marine Fisheries Service, Pacific Island Regional Office
1845 Wasp Avenue, Bldg 176
Honolulu, HI 96818

Dear Mr. Davis:

SUBJECT: ESSENTIAL FISH HABITAT IN THE HAWAII-SOUTHERN CALIFORNIA TRAINING AND TESTING STUDY AREA

This letter provides the National Marine Fisheries Service (NMFS) with information concerning the U.S. Navy's continuation of training and testing activities analyzed in the 2013 Hawaii-Southern California Training and Testing (HSTT) Environmental Impact Statement/Overseas Environmental Impact Statement (EIS/OEIS) which was the subject of consultations with NMFS concluding in July 2013. The Navy previously prepared an Essential Fish Habitat Assessment (EFHA) covering potential impacts of Navy activities on designated EFH areas within the HSTT Study Area in accordance with the Magnuson-Stevens Fisheries Conservation and Management Act of 1976, Public Law 94-265 as amended through October 11, 1996, section 305 (b) (2) and 50 C.F.R 600.92.

Currently, the Navy is preparing an updated EIS/OEIS (Phase III) to cover activities beginning in December 2018 and into the foreseeable future, using new information available after the release of the 2013 HSTT EIS/OEIS (Phase II). As discussed in Enclosure 1, there are no significant changes to actual activities, geographic parameters or levels of activities occurring in areas previously subject to consultation with NMFS, or to designated EFH areas in the HSTT Study Area that would alter the conclusions from the 2013 EFHA or affect the basis for NMFS' EFH Conservation Recommendations. Consequently, the Navy's previous analysis of impacts to EFH within the HSTT Study Area remains adequate and does not raise the requirement of supplemental consultation pursuant to 50 C.F.R. 600.920 (1). Therefore, the Navy is not requesting to reinitiate consultation at this time.

If you need additional information or have questions, please feel free to contact Ms. Cory Scott at (808) 471-4696 or cory.l.scott@navy.mil. The 2017 Draft HSTT EIS/OEIS is available at: www.HSTTEIS.com.

Sincerely,

L. M. Foster
By direction

Enclosures: 1. HSTT Phase II/Phase III EFH Comparison Analysis

Copy to: (w/enclosures)
Dr. Kelly Ebert, Chief of Naval Operations (N454)
Mr. Eric Chavez, NMFS Office of Protected Resources, Southwest Regional Office

U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
national marine fisheries service
Pacific Islands Regional Office
1845 Wasp Blvd., Bldg 176
Honolulu, Hawaii 96818
(808) 725-5000 · Fax: (808) 725-5215

Mr. Larry M. Foster
Director, Environmental Readiness
Department of the Navy
United States Pacific Fleet
250 Makalapa Drive
Pearl Harbor, HI 96860-3131

June 4, 2018

Dear Mr. Foster:

The NOAA National Marine Fisheries Service (NMFS) received the Navy's letter dated April 17, 2018 on April 30, 2018 providing documentation of analysis (hereafter, comparison analysis) and the Navy determination that a supplemental essential fish habitat (EFH) is not necessary for Phase III of the Hawaii and Southern California Testing and Training EIS (HSTT) pursuant to the Magnuson-Stevens Fisheries Conservation and Management Act (Magnuson-Stevens Act), section 305 (b) (2) and 50 C.F.R 600.920. NMFS is concerned that the Navy's determination is not consistent with the regulations. NMFS is proving feedback to clarify the regulatory process regarding supplemental EFH consultations and requesting additional information to more effectively consider the Navy's determination.

Background

NMFS first learned about HSTT EIS on November 12, 2015 when the Navy published a press release for scoping meetings and published a notice of intent to prepare an EIS for HSTT in the Federal Register (80 FR 69952). However, NMFS reviewed previous EFH Assessment on Phase I and Phase II of HSTT on April 7, 2008 and April 8, 2013, respectively.

NMFS Concerns

Adverse Effects Analysis

NMFS understands that there are new categories of activity in Phase III (acoustic stressors associated with low frequency broadband sources) and that some activities have been re-categorized, making direct comparisons between phases impractical. The Navy is aware that EFH has been revised, but that overall changes to the combined footprint of EFH in the areas covered by the Hawaii portion of HSTT study

area did not occur. However, when analysis of adverse effects to EFH are conducted, the best scientific information available (BSIA) must be used (50 CFR 600.920(d)), and NMFS is aware of two MUS that are undergoing EFH five year review, which has generated new information with the potential to change the basis for Conservation Recommendations. In addition, from 2015-2018 NOAA's Deep Sea Coral Research and Technology Program collected new geological, biological, ecological, and spatial data throughout the Pacific Islands Region. It is unclear to what extent this unpublished, but available information, was considered in the Navy's determination. It is also unclear to what extent these new data would change the basis of NMFS' Conservation Recommendations without further analysis.

Similarly, the Navy indicated that it used improved mapping products but it is unclear what data products those are. Due the sensitive nature of many habitat types that are included in the EFH definitions for the Hawaii Archipelago, especially coral reefs, the composition of living communities on the bottom can change dramatically in the course of five years. For that reason, NMFS does not consider natural resource information older than five years to be current, although it may continue to be the BSIA. However, NMFS is aware that new nearshore information exists for both marine habitats under the jurisdiction of the Marine Corps Base Hawaii and the Joint Base Pearl Harbor Hickam.

Navy's EFH Determination

The Navy refers to their Phase II EFHA as the basis from which to determine changes in adverse effects from Phase II to Phase III. However, there are numerous conclusions drawn in that assessment that are inconsistent with the definition of adverse effect in the Magnuson-Stevens Act (50 C.F.R. § 600.810). For example, the Navy states that "vessel noise and weapons noise were determined in the Phase II comparison analysis to have no measureable adverse effect on water column EFH." NMFS does not agree with this determination presently and did not agree to this determination through consultation on Phase II. However, it is likely that this was the Navy's position during consultation on Phase II, and appears to be the case presently. Numerous examples of this type of disagreement are evident in the comparison analysis provided by the Navy.

The Navy's comparison analysis of impacts appears to be focused on the effects of stressors to fish (i.e., management unit species (MUS)) not to the habitat that supports the MUS. While trophic-level adverse effects (e.g., prey base) should be evaluated in an EFH Assessment, the comparison analysis should focus on evaluating adverse effects to the water column and bottom habitats (see enclosure 1). NMFS is concerned that the Navy's comparison analysis from Phase II did not adequately account for all adverse effects and new research and information merits inclusion in an analysis of Phase III. For example, important new information regarding acoustic stressors has been published since Phase II (e.g., Casper et al., 2016; Edmunds et al., 2016; Iafrate et al., 2016; Hawkins and popper, 2017; Nedelec et al., 2016; Nedelec et al., 2017; Nichols et al., 2015; Simpson et al., 2016). In addition, it is appropriate for phased projects to provide updated cumulative adverse effects analyses whenever those effects are being proposed to continue between phases, which was absent from the Navy's comparison analysis.

EFH Consultation

The EFH regulations found at 50 C.F.R 600.920(a)(1) state, "Federal agencies must consult with NMFS regarding any of their actions authorized, funded, or undertaken, or proposed to be authorized, funded, or undertaken that may adversely affect EFH." NMFS and the Navy agree that adverse effects to EFH would occur as a result of all phases of HSTT. However, the regulation goes on to address situations for projects that were implemented prior to the EFH provisions in the Magnuson-Stevens Act (1996), indicating that EFH consultations are required "for renewals, reviews, or substantial revisions of actions if the renewal, review, or revision may adversely affect EFH." Evaluation of the need to consult on EFH with NFMS for Phase III must be predicated on if the proposed project activities would adversely affect EFH, since it does not pre-date the EFH provisions added to the Magnuson-Stevens Act (i.e., 1996).

The EFH regulations found at 50 C.F.R 600.920(l) directs federal agencies to seek a supplemental EFH consultations "if the agency substantially revises its plans for an action in a manner that may adversely affect EFH or if new information becomes available that affects the basis for NMFS EFH Conservation Recommendations." The Navy has interpreted the differences between Phase II and Phase III to be less than substantial and that the changes in the activities will not change the Conservation Recommendations provided for Phase II.

Based, on the information provided, NMFS understands that some levels of activities will change between phases, and that in some cases those activity levels would decrease overall. The Navy is also proposing some new activities in Phase III, and have considered new data in their comparison analysis. While it is acceptable to incorporate by reference a completed EFH Assessment (i.e., from Phase II) and provide supplemental analysis in areas where activities have changed, EFH definitions have changed, the baseline has changed, or new information becomes available that changes the basis for Conservation Recommendations (e.g., cumulative effects, impact recovery predictions, ecological linkages); the differences in adverse effects between phases (i.e., a supplemental EFH consultation) must be clearly evaluated to satisfy this consultation pathway. Alternatively, Phase III could be evaluated as a standalone project and a new consultation can be provided to reduce the complexities associated with comparisons between project phases.

NMFS believes that because the Navy is proposing new activities in Phase III, new information is being used to evaluate adverse effects, and because the regulations direct the Navy to consult with NMFS when project activities may reduce "the quality and/or quantity of essential fish habitat (50 C.F.R. § 600.810)," an EFH consultation is appropriate for HSTT Phase III.

Summary of NMFS Position

NMFS appreciates the Navy's efforts to provide NMFS with an updated comparison analysis to justify the determination that an EFH consultation is not necessary. However, NMFS requests that the Navy take the following two steps, so that NMFS' concerns described in this letter can be addressed.

1) Provide an explanation for what criteria the Navy used to determine "significance" of adverse effects from new and modified project activities, and what extent of differences between Phase II and Phase III would the Navy consider to be "substantial."
2) Provide one of the following:

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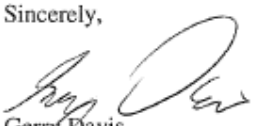
a) A comparison analysis (i.e., supplemental) that supports the Navy's determination for Phase III based on adverse effects to EFH rather than the MUS, with an updated cumulative effects analysis, that incorporates all BSIA.
b) A request for technical assistance in pre-consultation with NMFS for Phase III HSTT.
c) A request to initiate an individual EFH consultation for Phase III HSTT.

In general, NMFS prefers to begin inter-agency coordination through pre-consultation technical-level discussions between Navy and NMFS staff (i.e., option "b" above) to come to consensus about how project activities may adversely affect EFH, and how best to comply with the EFH provisions of the Magnuson-Stevens Act. Ideally, the lead federal agency would engage with NMFS during their planning process to avoid confusion of terms and/or clarify subjective evaluation criteria such as "significant" and "substantial." Likewise, NMFS prefers to have an opportunity to review previous Conservation Recommendations at the request of the lead federal agency, or ideally with the lead federal agency, for project renewals in order to conclude if new or revised Conservation Recommendations would reduce adverse effects to EFH. Engaging early with NMFS is recommended for all proposed activities subject to consultation under the EFH provision of the Magnuson-Stevens Act. Obtaining technical assistance from NMFS through pre-consultation is the most effective way to achieve compliance expeditiously.

Conclusion

NMFS does not agree that the information provided meets compliance with the EFH provisions of the Magnuson-Stevens Act. Additional information identified as bullets in this letter is requested and needed in order to provide NMFS with the level of information required to provide effective Conservation Recommendations that will help Navy avoid, minimize, and offset or otherwise mitigate adverse effects to EFH. NMFS supports Navy's intent to be good resource stewards and appreciate Navy's future effort in working with us to ensure that any unavoidable impacts to our trust resources are adequately mitigated. NMFS supports the need for military readiness and believes the mission of the Pacific Fleet is of utmost national security importance. We therefore highlight the importance of working closely to resolve NMFS's concerns. NMFS believes that our positive working relationship and mutual desire for a meaningful outcome for NOAA trust resources at risk while meeting the needs of the Fleet can be achieved. Please do not hesitate to contact Ian Lundgren at 808-725-5088 and/or ian.lundgren@noaa.gov with any questions or to request further technical assistance.

Sincerely,



Gerry Davis
Assistant Regional Administrator
Habitat Conservation Division

4

cc by e-mail:
Dr. Kelly Ebert, Chief of Naval Operations (N454)
Ms. Arlene Pangilinan, NMFS
Dr. Malia Chow, NMFS
Mr. Eric Chavez, NMFS

Enclosures

Minton, D. 2017. Non-fishing effects that may adversely affect essential fish habitat in the Pacific Islands Region. National Oceanic and Atmospheric Administration Final Report for contract AB-133F-15-CQ-0014.

References

Casper, B. M., T. J. Carlson, M. B. Halvorsen, A. N. Popper. 2016. Effects of Impulsive Pile-Driving Exposure on Fishes. Adv. Exp. Med. Biol. 875: 125-32

Edmonds, N. J., C. J. Firmin, D. Goldsmith, R. C. Faulkner and D. T. Wood. 2016. A review of crustacean sensitivity to high amplitude underwater noise: Data needs for effective risk assessment in relation to UK commercial species. Mar. Poll. Bull. 108: 5–11.

Hawkins, A. D., and A. N. Popper. 2017. "A sound approach to assessing the impact of underwater noise on marine fishes and invertebrates." ICES Journal of Marine Science 74.3:635-651.

Iafrate, J. D., S. L. Watwood, E. A. Reyier, D. M. Scheidt, G. A. Dossot and S. E. Crocker. 2016. Effects of pile driving on the residency and movement of tagged reef fish. PLoS ONE 11(11): e0163638.

Nedelec, S. L., A. N. Radford, L. Pearl, B. Nedelec, M. I. McCormick, M. G. Meekan, S. D. Simpson. 2017. "Motorboat noise impacts parental behaviour and offspring survival in a reef fish." Proc. R. Soc. B. Vol. 284. No. 1856.

Nedelec, S. L., S. C. Mills, D. Lecchini, B. Nedelec, S. D. Simpson, A. N. Radford. 2016. "Repeated exposure to noise increases tolerance in a coral reef fish." Environmental Pollution 216: 428-436.

Nichols, T. A., T. W. Anderson and A. Širović. 2015. Intermittent Noise Induces Physiological Stress in a Coastal Marine Fish. PLOS One 10: e0139157

Simpson, S. D., A, N. Radford, S. L. Nedelec, M. C.O. Ferrari, D. P. Chivers, M. I. McCormick and M. G. Meekan. 2016. Anthropogenic noise increases fish mortality by predation. Nat. Comm. 7: 10544.

5

Macariola-See, Nora R CIV NAVFAC PAC

Subject: FW: EFH Consultation for HSTT Phase III

-----Original Message-----
From: Scott, Cory L CIV COMPACFLT, N465CS
Sent: Thursday, August 2, 2018 8:49 AM
To: 'EFHESAconsult@noaa.gov' <EFHESAconsult@noaa.gov>
Cc: 'ian.lundgren@noaa.gov' <ian.lundgren@noaa.gov>; malia.chow@noaa.gov; Rivers, Julie A CIV COMPACFLT, N01CE1JR <julie.rivers@navy.mil>; Scheimer, Elizabeth A CIV NAVFAC PAC, EV <elizabeth.a.scheimer@navy.mil>; Johnson, Chip CIV COMPACFLT N01CE1CJ <chip.johnson@navy.mil>
Subject: EFH Consultation for HSTT Phase III

Ian,

Upon review of your June 4, 2018 letter, and as a result of our July 26, 2018 meeting, the Navy is requesting to initiate an expedited Supplemental EFH consultation on the Hawaii testing and training activities proposed in the HSTT Phase III DEIS relative to the following issues:

- revised/new EFH designations since the Phase II consultation

- any new applicable research not already considered by the Navy

We understand from our meeting of July 26, 2018 that, pursuant to our request to initiate consultation, NMFS will conduct an in-depth review of materials previously provided by the Navy, including the HSTT Phase III DEIS, the HSTT Phase II EFHA and supplemental materials provided on April 17, 2018 (letter) and July 20, 2018 (email). Further, we understand from our meeting that upon completion of the review of Navy provided materials, NMFS will provide a list of items that require further discussion and clarification prior to our next meeting, currently scheduled for Tuesday, Aug 21, 2018 at 1300.

Lastly, we would like to note that Navy policy requires regulatory processes, including EFH consultations, be completed prior to the publication of Final EIS, which will occur in mid-October 2018. Therefore, we are requesting your support in completing this consultation by early October 2018.

Aloha,

Cory, Julie and Liz

1

U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
national marine fisheries service
Pacific Islands Regional Office
1845 Wasp Blvd., Bldg 176
Honolulu, Hawaii 96818
(808) 725-5000 · Fax: (808) 725-5215

Mr. Larry M. Foster
Director, Environmental Readiness
Department of the Navy
United States Pacific Fleet
250 Makalapa Drive
Pearl Harbor, HI 96860-3131

October 11, 2018

Dear Mr. Foster:

The National Marine Fisheries Service, Pacific Islands Regional Office (NMFS), received an email request from your staff at the Commander, U.S. Pacific Fleet (hereafter, Navy) to complete a supplemental essential fish habitat (EFH) consultation for Phase III of the Hawaii-Southern California Training and Testing (HSTT) EIS/OEIS. The scope of the supplemental consultation includes aspects of the proposed activities that have changed since the Phase II 2013 EFH consultation was completed, and incorporation of any new scientific information that changes the basis of prior conservation recommendations. The Navy requested that the consultation be completed by early October 2018, and NMFS appreciates this opportunity to coordinate with the Navy and provide revised conservation recommendations pursuant to the Magnuson-Stevens Fisheries Conservation and Management Act (Magnuson-Stevens Act), section 305 (b) (2) and 50 C.F.R 600.920.

Overview

In order to streamline the Phase III supplemental EFH consultation, the Navy's EFH Assessment from Phase II (See Enclosure 1), all supporting materials and analysis are incorporated by reference 50 CFR 600.920(e)(5). Project activities and methods are superseded only where new information has been provided by the Navy. As necessary, NMFS will consider sources of scientific information that may be new to the Navy. Conservation recommendations from 2013 will apply, but will be revised where these new sources of supplemental information change the basis for NMFS determination.

NMFS Concerns

Adverse Effect Determinations

This EFH supplemental consultation incorporates by reference all information previously provided from previous phases of HSTT activities, except were new information has been provided, all previous determinations and conservations recommendations apply except where explicitly amended. Adverse effects to EFH are expected to remain minimal, as previously determined after considerations of applicable best management practices, mitigation measures, and conservation recommendations.

NMFS categorizes adverse effect types in four categories: temporary, short-term, long-term, and permanent. The severity is measured by intensity and spatial extent of the stressor, while the adverse effect type is based on the recovery rate from the impact and the pervasiveness of the impact at the ecological scale. Standard EFH effects analysis normally will use the most sensitive and hard-to-replace EFH resources based on the recovery time back to the baseline or the highest following stable state likely. Considering recruitment and growth rates of impacted fauna, oceanographic and geomorphologic features, and anticipated future conditions, living EFH resources which are altered or lost can be quantified as a debt. Non-living resources can also be adversely affected and lost, such as removal or impairment of feature to serve as shelter. These types of effects tend to be permanent.

The threshold for what effects are considered adverse to EFH is highly variable among the hundreds of species managed by the WPRFMC and NMFS. For example, multiple species included in each of the MUS in all FEPs have strong associations with the water column, especially the water surface in their egg and larval life stages. Those species typically have eggs that float very close to the surface (buoyant) and/or become planktonic as larvae. Therefore, physical disturbance of the surface (e.g., boat propeller churning) may be an adverse effect to the water column, which may reduce the fecundity of both MUS, their prey, and habitat forming organisms (e.g., coral). Both power generation studies (Schlezinger et al., 2013) and those that investigate the impacts of boating on zooplankton (Bickel et al., 2011) provide useful proxies in this respect. However, the severity of those potential adverse effects are dependent upon many factors that are complex to predict, including but not limited to: the reproductive cycles of a diverse assemblage of organisms potentially affected, oceanographic conditions (e.g., tides, prevailing currents, nearshore eddies), and the frequency of and forces generated by the vessels being operated.

The Navy provided a summary table of adverse effects determinations in a memo dated July 20, 2018 (see Enclosure 1) that are inconsistent with the definition of adverse effect in the Magnuson-Stevens Act (50 C.F.R. § 600.810). For example, the Navy states that "vessel noise and weapons noise were determined in the Phase II comparison analysis to have no measureable adverse effect on water column EFH." NMFS does not agree with this determination, along with numerous other similar "no effect" determinations. My staff is willing to investigate more specific descriptions of adverse effects determinations for the stressors summarized in this section, if the Navy initiates an expanded EFH consultation.

Sonar – The Navy uses sonar (underwater sound) to navigate, communicate, or detect underwater objects. Active sonar emits sound waves which reflect off objects and returns to the receiver whereas passive sonar uses listening equipment to pick up underwater sounds (HSTT EFH Assessment 2013).

The use of sonar may result in temporary acoustic impacts to water column EFH as it will alter the natural soundscape affecting the quality of water column EFH.

Explosives – Explosive and other impulsive activities include ordnance and munitions such as projectiles, missiles, bombs, and other munitions (e.g. demolition charges). Explosives detonated near the surface would result in a shock wave and recurring pressure waves in the water column (HSTT EFH Assessment 2013). Although most explosives would be at or below the water surface, charges associated with mine neutralization could occur near the ocean bottom (HSTT EFH Assessment 2013). Temporary physical and acoustic effects to water column EFH will occur from explosives detonated near the surface. Explosives detonated near the bottom may result in physical impacts to benthic communities, increase in turbidity (through disturbance of seafloor), and increase in acoustic impact. Physical impacts to soft bottom will be short-term, including an increase in turbidity, whereas physical impact changes to hard bottom would be permanent. Temporary effects to fish may be a change in fish behavior or distribution and permanent effects may be fish mortality.

Electromagnetic Devices – Electromagnetic devices use magnetic influence in activities such as mine neutralization and mine countermeasure activities. The majority of the activities include towed or unmanned mine warfare systems that mimic the electromagnetic signature of a passing vessel (HSTT EFH Assessment 2013). These may result in temporary behavioral effects to susceptible fish and invertebrates.

Vessel Movement and In-water Device Movement – Vessels are used in nearly all training and testing activities and include multiple types of vessels such as aircraft carriers, surface combatants, amphibious warfare ships, support crafts, and submarines (HSTT EFH Assessment 2013). Vessel noise may result in temporary acoustic impacts to water column EFH. Effects are expected to be temporary behavioral effects to fish. Vessels that approach the shore or beach such as amphibious vessels could cause physical effects to benthic communities; physical impacts to soft bottom will be short-term, including an increase in turbidity, whereas physical impact changes to hard bottom will be permanent.

Military Expended Material – Military expended materials include: non-explosive practice munitions, fragments from high explosive munitions; and expended materials other than ordnance, such as sonobuoys, ship hulls, expendable targets and aircraft stores (fuel tanks, carriages, dispensers, racks, carriages or similar types of support systems on aircraft which could be expended or recovered) (HSTT EFH Assessment 2013). Materials that are not recovered will result in marine debris that will either sink to the bottom or float and be transported by wind and ocean currents. Debris that sinks will result in permanent physical impacts to benthic habitat. Although ingestion rates are lower than sea turtles and marine mammals, ingestion of marine debris has been documented in approximately 40 fish species (CBD 2012).

Seafloor Devices – Seafloor devices are items that are deployed onto the seafloor and may later be recovered, including moored mine shapes, anchors, bottom placed instruments, and robotic vehicles referred to as "crawlers." Seafloor devices are either stationary or move very slowly along the bottom

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(HSTT EFH Assessment 2013). Physical impacts to soft bottom will be short-term, including an increase in turbidity, whereas physical impact changes to hard bottom will be permanent.

Contaminants – Contaminants introduced into the marine environment include byproducts from explosives, chemicals, and heavy metals (HSTT EFH Assessment 2013). Contaminants released into the marine environment will reduce water quality, resulting in short-term effects to water column EFH. Contaminants that sink may effect coral colonies.

Stressors

The proposed HSTT activities may result in adverse effects to EFH including physical impacts to benthic communities; increase in sedimentation and turbidity; increase in contaminants; and increase in acoustic impacts. Any proposed activity that occurs within designated EFH may cause the following adverse effects, described generally in this section. The extent and severity of individual stressors will be highly variable across the spectrum of HSTT activities, and the adverse effects may not be consistent from year to year even though the activities remain the same, due to external factors (i.e., climate change).

Physical Impacts to Benthic Communities – Physical damage to coral or coral reefs is often associated with the breaking of colonies or in the form of abrasion. The amount of damage is dependent on many factors, but is mostly due to the nature of the physical force and the types of corals being impacted (Storlazzi *et al.* 2005, Shimabukuro 2014). The abundance of fish and other coral-associated organisms are defined by the quantity and quality of a reef's structure and complexity, and any alterations can lead to declines in biodiversity (Alvarez-Filip *et al.* 2009).

Increase in Sedimentation and Turbidity – Increased sedimentation and turbidity can cause smothering of benthic species and block sunlight necessary for those species that rely on photosynthesis. In corals, sedimentation has been shown to reduce species diversity, change growth patterns, and reduce growth and survival (Rogers 1990). Whereas, in seagrass beds, sedimentation can result in covering plants, eventually leading to mortality. For fish, sedimentation is less likely to cause significant impacts because of their mobility, but some effects are still possible. Fish may be displaced from their normal home range which may result in negative intra- and interspecies interactions, which may impact fitness, lead to lower reproductive success, and make individuals less able to find prey or avoid predators (Kjelland *et al.* 2015).

Increase in Contaminants – An increase in contaminants can reduce fitness and cause mortality of exposed organisms. At the coral assemblage level, metal pollution has been linked to decreased coral species abundance, diversity (Ramos et al. 2004), and cover (Scott 1990). Often, contaminants entering the marine environment are lighter that water, and thus float on the surface where much of it evaporates within a few days (Neff et al. 2000). Unfortunately, this property of some contaminants may lead to greater exposure for seagrass ecosystems which could cause extensive mortality of the seabed, with the associated loss of juvenile fish and invertebrates due to the loss of habitat (Zieman et al. 1984). For those contaminants that sink, the effects on coral colonies may include mortality, tissue death, reduced growth, impaired reproduction, bleaching, and reduced photosynthetic rates (Fucik et al. 1984, Cook

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and Knap 1983, Neff and Anderson 1981, Burns and Knap 1989, Ballou et al. 1989, Guzman et al. 1993). Few studies have been conducted on the adverse effects of oil on tropical fish, but decreased growth, altered behavioral responses, and changes in metabolic rate have been observed (Johnson et al. 1979, Kloth and Wohlschlag 1972).

Increase in Noise – Noise has a broad range of potential effects, especially when it is loud and has high amplitude (Casper *et al.* 2016), or less intense but long-lasting (Popper and Hastings 2009). Behavioral changes can occur, resulting in animals leaving feeding or reproduction grounds (Slabbekoorn et al., 2012) or becoming more susceptible to mortality through decreased predator-avoidance responses (Simpson et al., 2016). Less intense but chronic noise can cause a general increase in background noise over a large area. Chronic noise will not likely result in mortality, but may mask biologically important sounds and alter the natural soundscape, cause hearing loss, and/or have an adverse effect on an organism's stress levels and immune system (Minton 2017). Masking of the normal reef sounds by artificial sounds may have an impact on species abundances and numbers on coral reefs. Research has shown that larvae of several reef fish families preferentially select traps emitting high frequency sounds over traps emitting sounds similar in frequency to normal background frequencies (Simpson *et al.* 2008). Studies on an invertebrate species has shown that chronic exposure to noise may lead to increased metabolic rates, causing a reduction in growth and reproduction (Lagardère 1982). Recent advances in passive acoustic technology and analysis indicates that coral reef larvae are using lower frequency sounds such as those made by grunting fishes. These daily sounds are primarily produced at night and during dusk and dawn. These types of sounds are produced most abundantly during spawning.

Cumulative Adverse Effects

A cumulative effects analysis must consider the changes to the marine environment that are expected to occur under the current climate trajectory. Considering that many effects in marine ecosystems have long durations due to slow ecosystem recovery (e.g., corals), activities proposed today could result in significant and irreversible damage to EFH in coming decades. In addition, individual adverse effects (stresses) often interact in ways that increase adverse effects (Brown 1997, Negri and Hooganbloom 2011). For example, elevated seawater temperatures can cause coral bleaching, but the temperature threshold at which coral bleaching occurs is lowered under elevated nutrient conditions. In another example, nutrient enrichment combined with large-scale physical damage can increase the probability of a shift in dominance from coral to algae, known as "phase-shifts."

Crain *et al.* (2008) reviewed over 200 studies examining cumulative effects for multiple stressors in intertidal and nearshore marine ecosystems to elucidate general patterns in cumulative stressor effects. The cumulative effects of any two stressors were distributed among all interaction types with 26% being additive, *i.e.*, no interaction, 36% synergistic and 38% antagonistic. In 62% of all cases, interactions between stressors resulted in an adverse effect on the species or ecosystem that was at least additive. In cases where a third stressor was considered, over two-thirds of the interaction became more negative, and the number of synergistic interactions increased to 66% of the cases.

The amount of Navy materials being deposited (i.e., MEM) is planned to continue for the foreseeable future. At an unidentified inflection point, adverse effects to EFH from the continual deposition of these

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materials over the same footprint will occur. As that point is approached, it will become more difficult to mitigate and restore ecological functions and services. We expect that the Navy will calculate the deposition rates and decomposition rates to determine maximum MEM loads as this action becomes decadal, since offset may become appropriate if MEM loading impairs the habitat function.

Revised Conservation Recommendations

The new information regarding adverse effects from acoustic stressors changes the basis of NMFS's Conservation Recommendation #3.

Original CR#3:
Increase the distance between activities resulting in acoustic non-impulsive stressors and importantly explosive impulsive stressors and coral reefs to greater than the currently proposed 0-320 yards (0-293 m). This will provide a greater protection/buffer zone around coral reefs hence minimize impact to these sensitive systems. Navy may wish to consider mirroring the distances proposed for the floating vegetation and kelp paddies in southern California for each of the stressors as listed on page 5-2.

Revised CR#3:

Maintain the Navy-proposed and implemented 350 yard buffer around coral reef habitats; and avoid continuous sounds (e.g., vessel movement and sonar) around coral reefs and active fish spawning aggregations (seasonally-specific to MUS) from dusk to dawn (including overnight).

Conclusion

NMFS supports the need for military readiness and recognizes the mission of the Pacific Fleet is of utmost national security importance. NMFS supports the Navy's intent to comply with all environmental laws with a strong commitment of environmental stewardship and appreciates the Navy to working with us to ensure that any unavoidable impacts to our trust resources are adequately mitigated. We look forward to continued cooperation and coordination to resolve NMFS's concerns. Enclosure 2 is a report (Minton 2017) that provides a comprehensive review of typical adverse effects to EFH in the Pacific Islands region, which will be helpful to the Navy for future consultations. NMFS believes that through our positive working relationship, meeting the needs of the Fleet can be achieved while conserving NOAA trust resources. Please do not hesitate to contact Ian Lundgren at 808-725-5088 and/or by email at ian.lundgren@noaa.gov with any questions or to request further technical assistance.

Sincerely,

Gerry Davis
Assistant Regional Administrator
Habitat Conservation Division

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cc by e-mail:
Dr. Kelly Ebert, Chief of Naval Operations (N454)
Ms. Arlene Pangilinan, NMFS
Dr. Malia Chow, NMFS
Mr. Eric Chavez, NMFS

Enclosures

Enclosure 1

Supplemental EFH Consultation Memo and enclosure 3, July 20, 2018

Enclosure 2

Minton, D. 2017. Non-fishing effects that may adversely affect essential fish habitat in the Pacific Islands Region. National Oceanic and Atmospheric Administration Final Report for contract AB-133F-15-CQ-0014.

References

Bickel, S. L., J. D. Malloy Hammond & K. W. Tang. 2011. Boat-generated turbulence as a potential source of mortality among copepods. Journal of Experimental Marine Biology and Ecology 401: 105–109.

Brown, B. 1997. Disturbances to Reefs in Recent Times. In: Life and Death of Coral Reefs (C. Birkeland, ed.). Kluwer Academic Publishers. pp. 354-379.

Casper, B. M., T. J. Carlson, M. B. Halvorsen, A. N. Popper. 2016. Effects of Impulsive Pile-Driving Exposure on Fishes. Adv. Exp. Med. Biol. 875: 125-32

Crain, C. M., K. Kroeker, and B. S. Halpern. 2008. Interactive and cumulative effects of multiple stressors in marine systems. Ecol. Lett. 11: 1304-15.

Edmonds, N. J., C. J. Firmin, D. Goldsmith, R. C. Faulkner and D. T. Wood. 2016. A review of crustacean sensitivity to high amplitude underwater noise: Data needs for effective risk assessment in relation to UK commercial species. Mar. Poll. Bull. 108: 5–11.

Hawkins, A. D., and A. N. Popper. 2017. "A sound approach to assessing the impact of underwater noise on marine fishes and invertebrates." ICES Journal of Marine Science 74.3:635-651.

Iafrate, J. D., S. L. Watwood, E. A. Reyier, D. M. Scheidt, G. A. Dossot and S. E. Crocker. 2016. Effects of pile driving on the residency and movement of tagged reef fish. PLoS ONE 11(11): e0163638.

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Nedelec, S. L., A. N. Radford, L. Pearl, B. Nedelec, M. I. McCormick, M. G. Meekan, S. D. Simpson. 2017. "Motorboat noise impacts parental behaviour and offspring survival in a reef fish." Proc. R. Soc. B. Vol. 284. No. 1856.

Nedelec, S. L., S. C. Mills, D. Lecchini, B. Nedelec, S. D. Simpson, A. N. Radford. 2016. "Repeated exposure to noise increases tolerance in a coral reef fish." Environmental Pollution 216: 428-436.

Negri, A., and M. Hoogenboom. 2011. Water Contamination Reduces the Tolerance of Coral Larvae to Thermal Stress. PLoS ONE 6(5): e19703.

Nichols, T. A., T. W. Anderson and A. Širović. 2015. Intermittent Noise Induces Physiological Stress in a Coastal Marine Fish. PLOS One 10: e0139157

Schlezinger,D.R., C.D. Taylor, and B.L. Howes. 2013. Assessment of zooplankton injury and mortality associated with underwater turbines for tidal energy production Mar Technol Soc J, 47 pp. 142-150.

Simpson, S. D., A, N. Radford, S. L. Nedelec, M. C.O. Ferrari, D. P. Chivers, M. I. McCormick and M. G. Meekan. 2016. Anthropogenic noise increases fish mortality by predation. Nat. Comm. 7: 10544.

Wooldridge, S. A., T. J. Done, C. R. Thomas, I. I. Gordon, P. A. Marshall and R. N. Jones. 2012. Safeguarding coastal coral communities on the central Great Barrier Reef (Australia) against climate change: realizable local and global actions. Clim. Change 112: 945-61.

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DEPARTMENT OF THE NAVY
COMMANDER
UNITED STATES PACIFIC FLEET
250 MAKALAPA DRIVE
PEARL HARBOR, HAWAII 96860-3131

IN REPLY REFER TO:
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October 16, 2018

Mr. Gerry Davis
Habitat Conservation Division
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
Pacific Islands Regional Office
1845 Wasp Blvd., Bldg. 176
Honolulu, Hawaii 96818

Dear Mr. Davis:

SUBJECT: ESSENTIAL FISH HABITAT SUPPLEMENTAL CONSULTATION FOR PROPOSED MILITARY READINESS ACTIVITIES IN THE HAWAII RANGE COMPLEX

Thank you for the comments provided in your letter of October 11, 2018. The Navy appreciates your prompt review of our Essential Fish Habitat (EFH) supplemental information and the 2017 Draft Hawaii-Southern California Training and Testing (HSTT) Environmental Impact Statement/Overseas Environmental Impact Statement (EIS/OEIS). The letter acknowledges the request from Commander, U.S. Pacific Fleet (hereafter, Navy) to complete a supplemental EFH consultation for Phase III of the HSTT EIS/OEIS for military readiness activities that are proposed to occur within the Hawaii Range Complex (HRC). The basis of the supplemental consultation, pursuant to the Magnuson-Stevens Fisheries Conservation and Management Act (Magnuson-Stevens Act), section 305 (b) and 50 CFR 600.920(l), is to consider new or different Navy activities and new scientific information that have come out since the completion of the 2013 HSTT EFH consultation and that may have an adverse effect on designated EFH, or that may alter conservation recommendations from 2013.

In accordance with 16 U.S.C. 1855(b)(4)(B) and 50 CFR 600.920(k)(1), this response includes a description of measures proposed by the Navy to avoid, mitigate, or offset the impact of the proposed activity on EFH, as well as an explanation of why Navy cannot fully comply with your proposed conservation recommendations. As the Navy's actions will not result in substantial adverse effects to EFH, the Navy does not require any expanded consultation outlined in 50 CFR 600.920(i).

Your letter included the following revised (from 2013) conservation recommendation:

"Maintain the Navy proposed and implemented 350-yard buffer around coral reef habitats; and avoid continuous sounds (e.g., vessel movement and sonar) around coral reefs and active fish spawning aggregations (seasonally-specific to management unit species (MUS)) from dusk to dawn (including overnight)."

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While the Navy fully intends to continue implementing a 350-yard buffer around coral reef habitat for certain activities, the Navy cannot implement the measure to the extent proposed. First, the Navy does not constitute its activities as a source of continuous sounds. The Navy's activities are typically intermittent, lasting from minutes to a few hours, the exception to this is during major training exercises. Even during major training exercises, sonar use and vessel movement is not always continuous, depending on the nature of the training activity. Second, it is not practical for Commanders to have knowledge about perpetually shifting resources, such as active fish spawning aggregations.

In addition, the Navy conducts other types of critical training and testing in nearshore areas that are in close proximity to coral reefs and most likely spawning aggregations, where it would be impractical for the Navy to adhere to the 350-yard buffer at all times. For example, Pearl Harbor, where the majority of Navy vessels transit to and from while stationed in Hawaii, contains reef-building corals. The Navy trains with sonar in nearshore environments (such as the Maui Basin) during events such as the Submarine Command Course, which is critical for training prospective submarine commanding officers to operate in shallow water. The Navy has designated the 4-Islands Region (including Maui Basin and adjoining areas) as a mitigation area where the Navy has agreed not to use surface ship hull-mounted mid-frequency active sonar during the humpback whale reproductive season (November to April) and has agreed not to use explosives in the mitigation area year-round. However, the Navy does need to use sonar in the area during other months of the year in order to get the training and testing benefit of the unique and challenging environmental conditions the area offers. The Navy is implementing geographic mitigation in several areas around Hawaii to limit surface ship hull-mounted mid-frequency active sonar and explosives that, while intended to prevent or avoid impacts to marine mammals, would also mitigate impacts to EFH.

The Navy will continue to implement the following mitigation measures, per the 2013 HSTT EFH assessment, to avoid and minimize impacts to sensitive habitats, including EFH, to the extent practical:

The Navy will not conduct explosive mine countermeasure and neutralization activities or explosive mine neutralization activities within a 350-yd radius of known or surveyed live hard bottom, artificial reefs, and shipwrecks. In addition, the Navy will not conduct explosive or non-explosive small-, medium-, and large-caliber gunnery activities using a surface target; explosive or non-explosive missile and rocket activities using a surface target; explosive or non-explosive bombing and mine laying activities; explosive or non-explosive mine countermeasure and neutralization activities, or precision anchoring within a 350-yd radius of known or surveyed shallow-water coral reefs[1] and precious coral beds to the extent practical.

[1] Per 2013 HSTT EFH consultation, this includes surveyed or known shallow-water coral reefs including mesophotic coral reef systems to an approximate maximum depth of 200 meters based on the approximate depth of the photic zone (Valentine et al. 2005).

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As agreed to in 2013, the Navy will also continue to include maps of sensitive habitat areas in the Navy's Protective Measures Assessment Program (PMAP) so Navy personnel are aware of and able to make decisions to avoid these areas whenever possible when conducting activities that have the potential to impact seafloor resources (Figure 1).

The Navy acknowledges that adverse effects to EFH are highly variable between the hundreds of species managed by the Western Pacific Region Fisheries Management Council (WPRFMC) and National Marine Fisheries Service (NMFS). However, the Navy disagrees with NMFS's interpretations of which stressors could result in impacts to EFH, and the extent/scale of any potential effects to EFH. As noted in our 2013 EFH assessment, the 2017 HSTT DEIS/OEIS, and the supplemental information provided during this supplemental consultation, any adverse effects to EFH in the HRC from Navy activities would be minimal and temporary, if any, as discussed below:

Vessel Movement and In-water devices – The Navy determined that physical disturbance to the water column as habitat for some life stages, as a result of Navy activities, primarily from vessel movement, would be minimal, temporary, and of short-duration (see Table 1). Many Navy vessel hulls have a hydrodynamic shape, and pelagic marine invertebrates are therefore generally disturbed, rather than struck, as the water flows around a vessel. Zooplankton are ubiquitous in the water column and typically experience natural high mortality rates.

Vessel noise and weapons noise – Generally, commercial vessel traffic and associated noise is relatively steady over time, while Navy traffic is episodic in the ocean. Activities involving Navy vessel movements occur intermittently and are variable in duration, ranging from a few hours to a few weeks, and may occur over a large spatial area. Even periods within the duration of the training or testing activity, vessel use may vary, given that there may be periods of no use for set-up time or breaks, or for other periods of non-activity, where vessel use may cease for hours at a time while ships are still at sea. Participants engaged in training and testing may consist of a single vessel involved in unit-level activity for a few hours or multiple vessels involved in a major training exercise that could last a few days within a given area. Navy traffic would be heaviest in the area off the southern coast of Oahu and near the entrance to Pearl Harbor. As stated above, Navy vessel traffic is episodic and is a small fraction of the overall vessel traffic in the waters around Hawaii and would likely not contribute in a perceptible change in the soundscape over existing vessel traffic. Any adverse effects from vessel noise would be minimal and of short-duration.

Underwater sound produced by weapons firing, launch, and impact of non-explosive practice munitions would be greatest near the surface and would attenuate with depth. Sound generally enters the water only in a cone beneath the blast or projectile trajectory (within 13 to 14 degrees of vertical for muzzle blast noise, and 65 degrees behind the projectile in the direction of fire for projectile shock waves). A sound exposure level of 180 to 185 dB re 1 μPa2-s was measured at water depth of five feet directly below the muzzle blast from a 5" diameter gun, the largest gun analyzed, at the firing position closest to the water. Weapons firing and launch typically occurs greater than 12 nautical miles (NM) from shore and would not overlap with

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EFH, with the exception of near Kaula Island and the Pacific Missile Range Facility in the HRC. Furthermore, because water depths would substantially limit the sound level reaching the bottom, adverse effects on benthic or biogenic habitats are unlikely. Adverse effects to the water column would be of brief duration (seconds) and limited to a relatively small volume of water near the surface (minimal).

Sonar – As stated in your letter, the Navy uses sonar to navigate, communicate or detect underwater objects. Table 1 includes the Navy's determination of effects to EFH from the use of sonar in the HRC. The Navy determined that there is little to no potential for adverse effects from sonar, with the exception of biogenic habitats, such as those inhabited by sessile or limited mobility invertebrates, in water depths of less than 200 m. However, given the limited distance to which marine invertebrates are sensitive to sound and the transient or intermittent nature (or both) of most sound sources, sonar and other sounds may result in brief, intermittent impacts on individual marine invertebrates and groups of marine invertebrates close to a sound source. The majority of surface ship active sonar activity mainly occurs in water depths of greater than 200 m. As discussed, the Navy implements mitigation in nearshore areas to avoid sensitive habitats, such as coral reefs. Most fish species are not able to hear mid-frequency and high-frequency active sonar, which are the majority of sonar sources used in the HRC. Any adverse effects from Navy sonar on biotic habitats or the water column as habitat, would be minimal and temporary.

Explosives – Explosive detonations are associated with high-explosive ordnance, including bombs, missiles, torpedoes, naval gun shells, explosive sonobuoys, mines and charges. Most explosive detonations during training and testing would be at or just below the water surface, in waters greater than 200 m in depth and typically beyond 3 NM of shore, bays, rivers, or estuaries. However, charges associated with Explosive Ordnance Disposal (EOD) mine neutralization would typically occur near the ocean bottom in designated underwater detonation areas in nearshore waters (e.g., Puuloa Underwater Range).

An explosion detonated near the surface would not disturb the substrate, but the shock wave could affect the pelagic water column habitat for fish and invertebrates. Bottom placed charges occur on sandy bottom habitat to the extent practical. While providing protection to sensitive bottom habitat from a conservation perspective, sandy bottoms are operationally needed to place training mine shapes to ensure a less complicated search process for training new divers or validating new technology. Adverse effects to EFH from the use of explosives would be minimal, temporary, of short-duration, and spatially spread out, with the exception of those that occur within designated underwater detonation areas in nearshore waters. Even these types of EOD mine neutralization are generally of small net explosive weights (<20 lbs). The percentage of training area affected would be small, so the disturbed areas of soft bottom substrates would be expected to return to their previous condition, similar to natural disturbances from wave and current activity; while hard bottom substrates may take longer to recover, they will still recolonize.

As discussed above and in the HSTT EIS/OEIS, Chapter 5 (Mitigation), the Navy will not conduct explosive mine countermeasure and neutralization activities or explosive mine neutralization activities within a 350-yd radius of known or surveyed live hard bottom, artificial

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reefs, and shipwrecks to the extent practical. In addition, the Navy will not conduct explosive or non-explosive small-, medium-, and large-caliber gunnery activities using a surface target; explosive or non-explosive missile and rocket activities using a surface target; explosive or non-explosive bombing and mine laying activities; explosive or non-explosive mine countermeasure and neutralization activities within a 350-yd radius of known or surveyed shallow coral reefs and precious coral beds. The types of activities that are most likely to result in physical damage to benthic communities are conducted further offshore in deeper waters to avoid sensitive habitats shown in Figure 1.

Electromagnetic Devices – As discussed in the HSTT EIS/OEIS, the strength of the magnetic field that these devices are producing is relatively weak and would only affect a very limited area of water (few meters). There have not been documented effects on invertebrates at the strength generated by Navy activities. Studies with much higher field strengths have shown no detectability by invertebrates. In addition, Navy activities are limited to surface waters where relatively few invertebrate species occur (e.g., zooplankton, squid, jellyfish). Electromagnetic devices are typically used during daylight, when invertebrates are even less likely to be at the top of the water column (e.g. squid, etc. tend to follow scattering layer). As such, temporary behavioral effects to fish and invertebrates as prey species would not result in changes in their distribution, availability, or numbers and are not measureable and therefore, will not result in adverse effects to prey species. Adverse effects to the water column and benthic habitat from electromagnetic devices would be minimal and of short-duration, and spatially spread out.

Military Expended Materials – The potential for physical disturbance to habitats designated as EFH by military expended materials (MEM) from Navy training and testing activities exists throughout the Study Area, although the types of MEM vary by activity and region, with some locations having greater concentration of activity than others. Most activities involving MEM occur further offshore, away from sensitive habitat areas, where the potential for higher concentrations of MEM to accumulate would be in areas such as KAPU and WELA HOT (see Figure 2). MEM in the coastal portions of the HRC would be limited to smaller items such as small-caliber projectiles, flares, and target fragments. The small size of these MEM means Navy activities in the HRC would have a minimal effect on biogenic habitats. As discussed in the EIS/OEIS and the 2013 Essential Fish Habitat Assessment (EFHA), there is the potential for some MEM to settle on the marine substrate, where in time the material often becomes encrusted or buried in the sediment and then incorporated into the hard bottom. MEM often provides an additional function as habitat and can potentially result in increases in the abundance and distribution of benthic macrofauna and megafauna. MEM on abiotic and biotic substrates in some areas may become buried rather quickly, while in other areas they may persist on the surface of the seafloor for a more extended time, depending on the nature of the environment and dynamic coastal processes. Between initial settlement and burial or complete degradation, relatively stable objects will likely function as small artificial habitats for encrusting algae, attached macroalgae/seaweed, sedentary invertebrates as well as small motile organisms. In an example of colonization, Kuhnz, L. et al., (2015) indicates that repeated surveys of the Monterey

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Accelerated Research System (MARS) cable on the seabed have shown that the unburied portions of the cable located on hard substrate have been readily used as habitat by marine organisms, and that natural spatial and temporal variations in the abundance and distribution of benthic macrofauna and megafauna appear to be greater than any detectable effects due to the MARS cable. The portions of the water column designated as EFH would be minimally impacted by MEM from training and testing events.

In interpreting Navy's analysis from the HSTT EIS/OEIS, it is important to understand that the Navy deliberately used a conservative (i.e. over-predictive) approach. The Navy analyzed the worst case scenario using a list of every MEM item that could potentially be used and assumed the maximum quantity of any given item would be used, rather than trying to model exact historic expenditures which are difficult to track. Activity-specific MEM values were summed annually for evaluation in the EIS/OEIS. It should be re-emphasized that these calculations represent worst case predictions. On an annual basis, not every event uses every category of MEM or the maximum quantity of MEM forecast. In addition, not every activity occurs the maximum number of time predicted in the EIS/OEIS. In summary, the Navy analyzed the greatest amount of MEM under the worst case scenario, with the understanding that quantities would never be higher than those predicted at this maximum rate. In addition, the Navy has formed an MEM working group comprised of Navy personnel across multiple disciplines (e.g., operations, planning, conservation), to continue to refine and improve its MEM data collection and analysis process for the next phase of Navy environmental documents.

Seafloor devices – The use of seafloor devices during training and testing activities would potentially have an adverse effect on soft bottom substrates. These impacts would be minimal in size and temporary (recovery in days to weeks) in duration except in cases where bottom placed instrument anchors or mine shapes are not recovered or cables associated with instrumentation are placed on the seafloor. It is not expected that hard bottom substrates would be affected by the use of seafloor devices as they are generally avoided to not only avoid impacts to the substrate but to the devices themselves.

Contaminants – The HSTT EIS/OEIS analyzed the potential effects on water quality from MEM and constituents released as a byproduct of explosives. Training and testing activities may introduce constituents into the water column however, most releases of MEM, as discussed above, are typically confined to offshore areas outside the coastal zone and sensitive nearshore habitats. Based on the analysis of the HSTT EIS/OEIS, contaminates resulting from undetonated explosive materials would be released in quantities and at rates that would not result in a violation of water quality standards or criteria. High-order explosions consume most of the explosive material, creating typical combustion byproducts. For example, in the case of Royal Demolition Explosive, 98 percent of the products are common seawater constituents and the remainder is rapidly diluted below detectable levels.

Indirect effects of explosives and unexploded ordnance to marine species via sediment is possible in the immediate vicinity of the ordnance. Degradation products of Royal Demolition

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Explosive are not toxic to marine organisms at realistic exposure levels (Rosen & Lotufo, 2010). Relatively low solubility of most explosives and their degradation products means that concentrations of these contaminants in the marine environment are relatively low and readily diluted. Furthermore, while explosives and their degradation products were detectable in marine sediment approximately 6–12 in. away from degrading ordnance, the concentrations of these compounds were not statistically distinguishable from the background environment beyond 3–6 ft. from the degrading ordnance. Taken together, it is possible that marine species could be exposed to degrading explosives, but it would only be within a very small radius of the explosive (1–6 ft.).

Impacts from explosives and explosives byproducts would be short-term and local. Impacts from unconsumed explosives and constituent chemical compounds would be minimal and limited to the area adjacent to the munition. Explosives and constituent compounds could persist in the environment depending on the integrity of the undetonated munitions casing and the physical conditions on the seafloor where the munition resides. Chemical and physical changes to sediments and water quality, as measured by the concentrations of contaminants or other anthropogenic compounds, may be detectable and would be below applicable regulatory standards for determining effects on biological resources and habitats.

Impacts from other chemicals not associated with explosives would be both short and long term depending on the chemical and the physical conditions on the seafloor where the source of the chemicals resides. Impacts would be minimal and localized to the immediate area surrounding the source of the chemical release.

Impacts from metals would be minimal yet long term, dependent on the metal and the physical conditions on the seafloor where the metal object (e.g., non-explosive munition) resides. Impacts would be localized to the area adjacent to the metal object. Concentrations of metal contaminants near the expended material or munition may be measureable and are likely to be similar to the concentrations of metals in sediments from nearby reference locations.

Impacts from other expended materials not associated with munitions would be both short and long term depending on the material and the physical conditions on the seafloor where the material resides. Impacts would be localized to the immediate area surrounding the material. Chemical and physical changes to sediments and water quality, as measured by the concentrations of contaminants or other anthropogenic compounds near the expended material, are not likely to be detectable and would be similar to the concentrations of chemicals and material residue from nearby reference locations. Increased sedimentation and turbidity could result from various Navy activities. However, it is expected that any effects associated with sedimentation and turbidity would be temporary and localized.

Equipment used by the Navy within the HRC, including ships and other marine vessels, aircraft, and other apparatus, are also potential sources of by-products. All equipment is properly maintained in accordance with applicable Navy or EPA standards. All such operating equipment meets federal water quality standards, where applicable.

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Increased Noise – Chronic noise, as described in your letter, is not generally associated with Navy activities as our activities tend to be more dispersed, episodic, and more variable than commercial traffic. As discussed above, ship traffic from Navy vessels is a small percentage of overall ship traffic, Navy vessels are much quieter than commercial or recreational vessels, and they do not take standard routes. They are generally used intermittently for activities for a few hours or to several days at a time.

While masking of normal reef sounds by anthropogenic sources (e.g., (for example by small-boat noise)) has the capacity to disrupt settlement of coral reef fish or coral larvae, which may lead to impacts on recruitment to adult populations (Holles et al 2013),); measurable effects on fish recruitment would not be expected from most Navy vessels due to quieting technologies employed on Navy ships.

Anthropogenic noise attributable to Navy training and testing activities in the HRC emanates from multiple sources including active sonar, explosives, and other impulsive sounds. Sound produced from training and testing activities in the HRC is temporary and transitory. For example, passive acoustic monitoring documented periodic mid-frequency active sonar from Navy surface ships in the Southern California portion of the HSTT Study Area showing increased use during major training exercises and temporal gaps with no or very limited unit-level training between major exercises (Rice et al., 2017). The sounds produced can be widely dispersed or concentrated in small areas for varying periods, from hours to a few weeks. However, any anthropogenic noise attributed to Navy training and testing activities in the HRC would be temporary and the affected area would be expected to almost immediately return to the original state when these activities cease. Any impacts on EFH due to generalized "increased noise" would be temporary and minimal, as described above in the previous sections discussing specific types of acoustic stressors.

We thank you for your support of this critical project and appreciate your timely response to meet our given timeline for completing this consultation.

Sincerely,

Larry M. Foster

Larry. M. Foster
Director, Fleet Environmental Readiness
By direction of the Commander

Enclosure: (1) HSTT EFH Summary of Effects Determinations and Supporting Figures

Copy to:
Chief of Naval Operations (N454)

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Enclosure 1. HSTT EFH Summary of Effects Determinations and Supporting Figures

Table 1. HSTT Phase III EFHA Summary of potential effects on Essential Fish Habitat and Habitat Areas of Potential Concern from each stressor.

Stressors	Water Column	Substrate	Biogenic	HAPC
Acoustic stressors				
Non-impulsive • Sonar • Vessel noise	Minimal and temporary	No effect	No effect	No effect
Explosives and other impulsive sources • Underwater explosions • Weapons noise	Minimal and temporary	Minimal and short term (soft bottom) to permanent (hard bottom); mitigation avoids mapped hard bottom.	• Attached macroalgae: minimal and long term based on hard substrate impacts • Submerged rooted vegetation: minimal and long-term; mitigation avoids sensitive nearshore habitats • Sedentary invertebrate beds: minimal and short term to permanent (based on substrate impacts); mitigation avoids mapped hard bottom • Reefs: minimal and long term; mitigation avoids coral reefs	Minimal and variable duration (habitat dependent); mitigation avoids sensitive nearshore habitats, mapped hard bottom, and surface macroalgae concentrations
Energy stressors				
Electromagnetic devices	Less than minimal and temporary	No effect	No effect	No effect
Physical disturbance and strike stressors				
Vessel movement	No effect	No effect	No effect	Minimal and short term for offshore HAPCs; mitigation avoids mapped hard bottom and macroalgae concentrations
In-water devices	No effect	No effect	• No effect: mitigation avoids sensitive habitats	Minimal and short term for offshore HAPCs; mitigation avoids mapped hard bottom and macroalgae concentrations

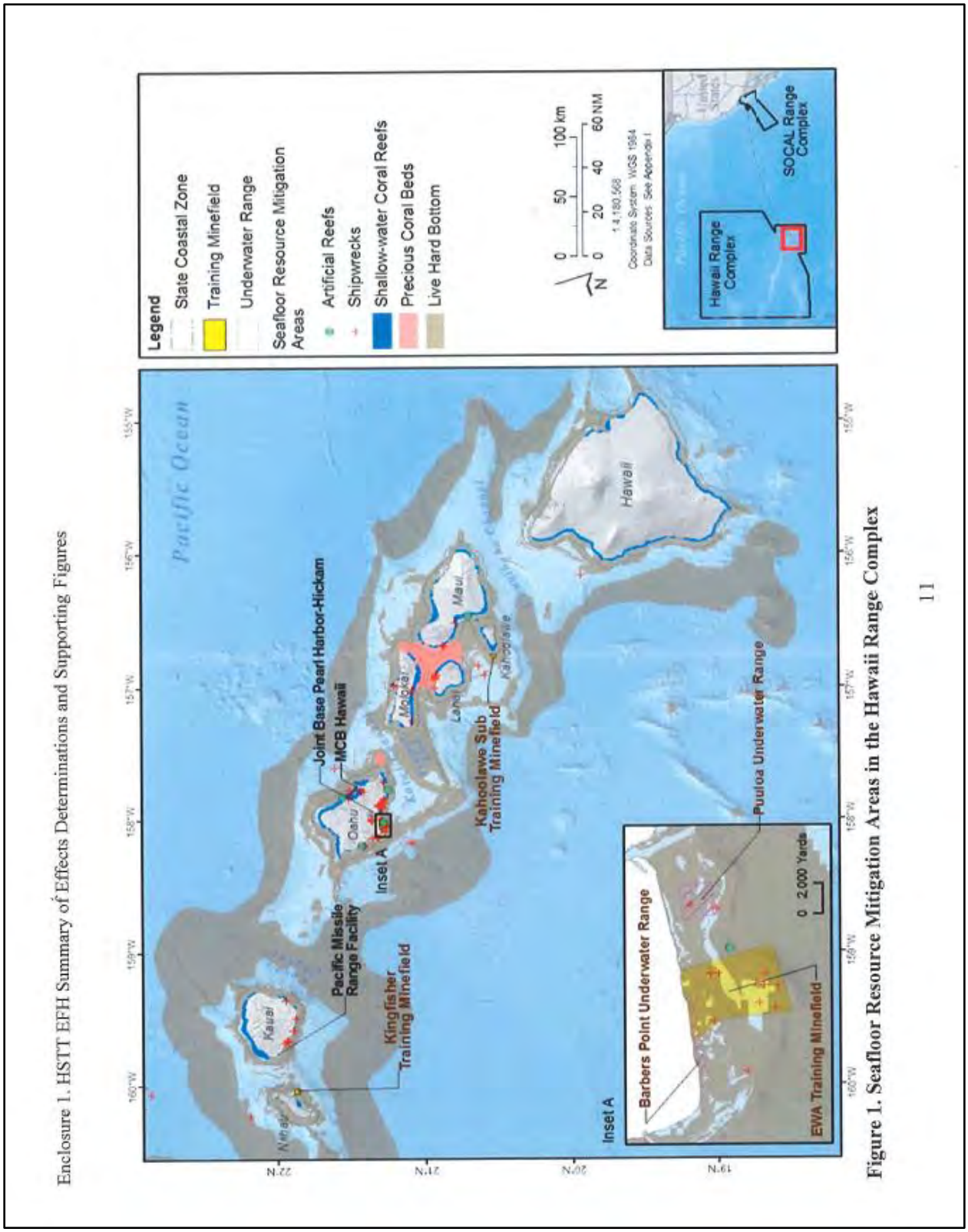
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Enclosure 1. HSTT EFH Summary of Effects Determinations and Supporting Figures

Stressors	Water Column	Substrate	Biogenic	HAPC
Physical disturbance and strike stressors (continued)				
Military expended materials	Minimal and temporary	Minimal and long term to permanent	• Attached macroalgae: Minimal and short term. • Submerged rooted vegetation: minimal and long term; mitigation avoids sensitive nearshore habitats • Sedentary invertebrate beds: minimal and long term to permanent (based on substrate impacts) • Reefs: mitigation avoids shallow coral reefs	Minimal and variable duration (habitat dependent); mitigation avoids sensitive habitats and surface macroalgae concentrations
Seafloor devices	No effect	No effect	Minimal and temporary	Minimal and short term to long-term for bottom placed instrument anchors or mine shapes not recovered or cables associated with instrumentation placed on the seafloor
Contaminant stressors				
Explosives and explosive byproducts	Minimal and short term	Minimal and short term	• Sedentary invertebrate beds and reefs: Minimal and short term • Other biogenic habitats: no effect	Minimal and short term
Metals	No effect	No effect	No effect	No effect
Chemicals	No effect	No effect	No effect	No effect
Other materials	No effect	No effect	No effect	No effect

Note: HAPC = Habitat Areas of Particular Concern

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Enclosure 1. HSTT EFH Summary of Effects Determinations and Supporting Figures

Figure 1. Seafloor Resource Mitigation Areas in the Hawaii Range Complex

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Enclosure 1. HSTT EFH Summary of Effects Determinations and Supporting Figures

The Navy applied the data from the NOAA Deep Sea Coral Research and Technology Program as an overlay to the Navy's primary training and testing areas as recommended (Figure 2). With the exception of Pu'uloa Underwater Training Range (Oahu) which has been used for training and testing for decades, the majority of activities using explosives occur in the Warning Areas and restricted airspace as shown below.

Figure 2. NOAA Deep Sea Coral Research and Technology Program data relative to Navy primary training and testing areas

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J.5 MARINE MAMMAL PROTECTION ACT

DEPARTMENT OF THE NAVY
COMMANDER
UNITED STATES PACIFIC FLEET
250 MAKALAPA DRIVE
PEARL HARBOR, HAWAII 96860-3131

IN REPLY REFER TO:
5090
Ser N465/1078
11 September 2017

Director, Office of Protected Resources
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
B-SSMC3, Room 13821
1315 East-West Highway
Silver Spring, MD 20910–3282

Dear Director:

On behalf of Commander, U.S. Pacific Fleet, a Letter of Authorization (LOA) application is being submitted pursuant to the Marine Mammal Protection Act requirement for the taking of marine mammals incidental to Navy training and testing activities in the Hawaii-Southern California Training and Testing (HSTT) area from December 2018 to December 2023.

Analysis supporting the application is contained within the HSTT LOA application and in the Navy's 2017 HSTT Draft Environmental Impact Statement/ Overseas Environmental Impact Statement (DEIS/OEIS). Due to the large file size and page count (>550 pages), the Navy will be electronically submitting the HSTT LOA application directly to the appropriate National Marine Fisheries Service staff.

Please extend my thanks to your staff for their continued support of the U.S. Navy's compliance process. We are available to meet with you or your staff should you have comments on the enclosed report or recommendations for future reports. My point of contact for these matters is Mr. Chip Johnson at 619-767-1567 or chip.johnson@navy.mil.

Sincerely,

L. M. FOSTER
By direction

J.6 NATIONAL HISTORIC PRESERVATION ACT

DEPARTMENT OF THE NAVY
COMMANDER
UNITED STATES PACIFIC FLEET
250 MAKALAPA DRIVE
PEARL HARBOR, HAWAII 96860-3131

IN REPLY REFER TO:
5090
Ser N465/1215
October 02, 2017

Mr. John Fowler
Executive Director
Advisory Council on Historic Preservation
401 F St NW #308
Washington, DC 20001

Dear Mr. Fowler:

SUBJECT: NATIONAL HISTORIC PRESERVATION ACT, SECTION 106 NOTIFICATION FOR PROPOSED HAWAII-SOUTHERN CALIFORNIA TRAINING AND TESTING ACTIVITIES

In accordance with 36 CFR Part 800, the United States Department of the Navy is initiating National Historic Preservation Act Section 106 consultation regarding a proposal to conduct military readiness activities in the Hawaii-Southern California Training and Testing (HSTT) Study Area. The Navy determined that the proposed project is an undertaking as defined in 36 CFR 800.16(y).

The Navy is notifying the Council pursuant to 36 CFR 800.8(a), that the Navy plans to solicit input from the public by holding Section 106 meetings in conjunction with the public meetings for the Draft HSTT Environmental Impact Statement/Overseas Environmental Impact Statement (EIS/OEIS). Comments regarding historic properties in the area of potential effect (APE) that are received during the National Environmental Policy Act (NEPA) and Section 106 process will be considered under Section 106.

DESCRIPTION OF UNDERTAKING

The proposed undertaking is to conduct military readiness activities, which includes the use of active sonar and explosives, primarily within existing range complexes and operation areas (OPAREAs) at-sea off the coasts of Hawaii and Southern California (SOCAL), on the high seas during vessel transit between these areas and at select Navy pierside and harbor locations (Enclosure 1).

The Navy previously completed Section 106 consultations in 2012 (separately for Hawaii and California) and an EIS/OEIS in December 2013 for training and testing activities in the same HSTT Study Area; the updated analysis will re-evaluate potential environmental impacts associated with ongoing activities addressed in the 2013 EIS/OEIS.

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Ser N465/1215
October 02, 2017

Hawaii: Nearly all of the training and testing activities in the Hawaii Range Complex (HRC) would be conducted within the Hawaii OPAREA; the portion of the range complex immediately surrounding the island chain from Hawaii to Kauai (Enclosure 2). Activities include gunnery and explosive exercises as well as the use and maintenance of sonar equipment. Surface ship and submarine sonar maintenance and testing could potentially occur in select pierside locations in Pearl Harbor.

SOCAL: Training and testing activities within the SOCAL portion of the Study Area would be mainly restricted to the open ocean portions of the SOCAL Range Complex within the SOCAL OPAREA including the waters surrounding San Clemente Island, boat lanes, and anchorages offshore of the Silver Strand Training Complex (SSTC), and the bayside training areas within San Diego Bay. See Enclosures 3 through 6 for maps depicting the various training and testing locations in SOCAL. Activities include gunnery and explosive exercises as well as the use and maintenance of sonar equipment. Surface ship and submarine sonar maintenance testing could potentially occur in select pierside locations within San Diego Bay.

AREA OF POTENTIAL EFFECT

The Area of Potential Effect (APE) would encompass the HSTT Study Area, which consists of the at-sea areas off the coasts of Hawaii and SOCAL; areas on the high seas between the Navy's Hawaii and SOCAL range complexes where training and sonar testing and maintenance may occur during vessel transit between these areas; the Temporary OPAREA north and west of the Hawaii OPAREA; and at select Navy pierside and harbor locations (Enclosure 1).

IDENTIFICATION OF HISTORIC PROPERTIES

Hawaii:

A majority of the proposed training and testing activities in the HRC will take place within open ocean areas of the Hawaii OPAREA (Enclosure 2). Submerged cultural resources, which include shipwrecks and plane wrecks, have been documented within these waters.

The Papahanaumokuakea Marine National Monument and World Heritage Site, an area having both cultural and ecological significance, is located northwest of the Hawaii OPAREA within the Temporary Operating Area (Enclosure 7). The majority of training activities are conducted east of Nihoa Island in the Hawaii OPAREA, with only a few activities occurring inside the eastern edge of the monument boundaries. These activities include training during transit as well as sonar and periodic multi-range test events that include support from the Pacific Missile Range Facility. Explosives are not used in the Papahanaumokuakea Marine National Monument.

The ocean around the Papahanaumokuakea Marine National Monument can be treacherous for ships due to submerged reefs, seamounts, and shoals. Some of the earliest known shipwrecks

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October 02, 2017

in Hawaii are located at Kure Atoll and include the *USS Saginaw*, which sank in 1870 and the remains of what may be the whaleship *Parker* that sank in 1842. The Two Brothers whaleship out of Nantucket sank on February 11, 1823 off the French Frigate Shoals. This whaleship was listed on the Hawaii State Register in March 2017.

Midway Atoll is also located within Papahanaumokuakea Marine National Monument. The atoll was first identified by Captain N.C. Brooks of the *Gambia* in 1859. Construction of Naval Air Station (NAS) Midway began in 1940. Japan attacked NAS Midway on December 7, 1941, coinciding with the attack on Hawaii, and then again in 1942. This latter attack, known as the Battle of Midway, was one of the most decisive naval battles of World War II. The National Memorial to the Battle of Midway was designated in 2000 and includes aircraft and ships sunk during the battle, such as P-40K Warhawks, F2A-3 Buffaloes, and F4U Corsairs recently recorded by National Oceanic and Atmospheric Administration's Maritime Heritage Team.

Papahanaumokuakea Marine National Monument also includes islands that have religious and cultural significance, such as Mokumanamana Island (Necker Island), which is known for its *wahi pana* (religious places). The proposed training activities are located within the open ocean waters and avoid these islands.

Pearl Harbor is also a historically important area in Hawaii. Traditionally, Pearl Harbor was called Ka-awa-lau-o-pu'uloa, which can be translated as the many harbored sea of Pu'uloa or the leaf-shaped lagoon of Pu'uloa. There are traditional references to fishponds that were constructed in the harbor as well as information about the abundant marine resources such as shellfish and fish. Traditional Hawaiian fishponds were constructed along the shores between the 14th and 19th centuries in fairly protected areas to raise fish.

Development of Pearl Harbor as a Navy base began in 1908. Pearl Harbor is most known as a target in the Japanese attack on Oahu on December 7, 1941. Pearl Harbor was designated as a National Historic Landmark due to its role in the attack (Site 50-80-13-9992). Other losses during the attack are situated within the waters around Oahu and include the flying boats (PBYs) from NAS Kaneohe that sank in Kaneohe Bay.

Southern California:

A majority of the training and testing activities in the SOCAL portion of the HSTT Study Area would take place within the open ocean areas of the SOCAL Range Complex and OPAREA, and boat lanes and anchorages offshore of the SSTC including the bayside training areas within San Diego Bay. The Study Area contains no identified National Register-listed or eligible sites.

A total of 104 submerged cultural resources including, but not limited to, aircraft, pleasure craft, sport and commercial fishers, and cargo and military vessels have been identified in the waters within the SOCAL Range Complex and OPAREA. In the vicinity of San Clemente

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Island, these include 35 shipwrecks, 14 unknown or unidentified vessels, 17 aircraft, an anchor, and the abandoned Sea Lab III. Of these 68 submerged resources, 22 are within 12 nautical miles of San Clemente Island and seven are beyond that territorial limit; there is no locational information available for the remaining 34 resources.

On the bay side of the Silver Strand peninsula, three shipwrecks are in or near the training beaches. Unnamed wrecks are recorded in shallow water at the northern end of Delta South beach, in the middle of San Diego Bay, and at the mouth of Fiddler's Cove. The age and cultural value of these wrecks are not known.

On the ocean side of the peninsula, three shipwrecks are located near SSTC training areas; the bark *Narwhale* (sank in 1934); the submarine S-142; and the Subchaser YC689 (sank in 1943). Additionally, the destroyer USS Hogan (DD178), a military aircraft (S2F Tracker), and a sunken sailboat are located offshore, south of SSTC and west of the City of Imperial Beach.

A complete inventory of cultural resources has not been completed for all of San Diego Bay. However, a cultural resources review was completed for the San Diego Deepening at Tenth Avenue marine Terminal project. This review identified three known submerged cultural features: a shipwreck (the *Della*), an 1887 marine utility cable, and a sunken Ford Model T. The EDAW study also identified 24 cultural resources with unknown location, but known to be lost in the San Diego area, including schooners, barges, clippers, gas and oil screws, a submarine, a yacht, a bark, a ferry, a ship, and a steamer.

DETERMINATION OF EFFECT

With the initiation of the Section 106 process for the proposed HSTT EIS/OEIS, the Navy is seeking information from consulting parties, Indian Tribes, and native Hawaiian organizations, to help identify historic properties in the APE in addition to those identified during the 2012 Section 106 consultations (30 CFR 800.4) and discussed in this letter. Following identification and evaluation of historic properties, the Navy, in consultation with the State Historic Preservation Officer (SHPO), Indian Tribes, and native Hawaiian organizations that attach religious and cultural significance to the identified property, will assess the effects of the undertaking on historic properties in a manner consistent with the standards and criteria of 30 CFR 800.4 through 800.5. The Navy does not anticipate that the undertaking will adversely affect historic properties because the action will occur in the open ocean; and falling debris will not damage historic properties, such as shipwrecks, within the APE. Potential effects within the marine national monument could include disruptions to cultural voyaging and wayfinding; however, these would be considered a temporary impact to cultural navigation because both Navy and cultural voyaging activities are considered transitory, and there would be minimal to no overlap. Following the public meetings, the Navy will inform SHPO, Indian Tribes, native Hawaiian organizations, and consulting parties of any additional information regarding the identification of historic properties.

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October 02, 2017

Should you or your staff have any questions or concerns please contact Ms. Coral Rasmussen of Naval Facilities Engineering Command Pacific Cultural Resources Division at (808) 472-1432 or email at coral.rasmussen@navy.mil or Mr. Richard Bark of Naval Facilities Engineering Command Southwest Cultural Resources Division at (619) 532-4419 or at richard.bark@navy.mil.

Sincerely,

L. M. FOSTER
By direction

Enclosures: 1. HSTT EIS/OEIS Study Area
2. Hawaii OPAREA
3. SOCAL Training and Testing Areas
4. San Clemente Island Nearshore Training Areas
5. San Clemente Island Offshore Training Areas
6. Silver Strand Training Complex
7. Papahanaumokuakea Marine National Monument

5

J.6.1 CALIFORNIA

DEPARTMENT OF THE NAVY
COMMANDER
UNITED STATES PACIFIC FLEET
250 MAKALAPA DRIVE
PEARL HARBOR, HAWAII 96860-3131

IN REPLY REFER TO:
5090
Ser N465/1213
October 02, 2017

Julianne Polanco
State Historic Preservation Officer
Department of Parks and Recreation
1725 23rd Avenue, Suite 100
Sacramento, CA 95816

Dear Ms. Polanco:

SUBJECT: NATIONAL HISTORIC PRESERVATION ACT, SECTION 106 CONSULTATION FOR PROPOSED HAWAII-SOUTHERN CALIFORNIA TRAINING AND TESTING ACTIVITIES

In accordance with 36 CFR Part 800, the United States Department of the Navy is reinitiating National Historic Preservation Act Section 106 consultation with your office regarding the subject project which, through previous consultations that occurred in 2012, has been determined to be an undertaking as defined in 36 CFR 800.16(y). In a letter dated June 5, 2012 (reference: USN120509B), your office previously concurred with the Navy's finding of No Historic Properties Affected for the Southern California (SOCAL) component of this undertaking (Enclosure 1). The Navy is writing to advise you that the SOCAL component of the undertaking has not changed and requests your office reaffirm its concurrence with the Navy's finding of No Historic Properties Affected. For your situational awareness, a recap of the project description, the Area of Potential Effect (APE), and the efforts to identify historic properties as detailed in the 2012 letter initiating consultation is provided below along with the proposed public participation.

PROJECT DESCRIPTION

The Hawaii-Southern California Training and Testing (HSTT) Environmental Impact Statement/Overseas Environmental Impact Statement (EIS/OEIS) Proposed Action includes training and testing activities at-sea off the coasts of Hawaii and SOCAL, on the high seas during vessel transit between these areas, in the Temporary Operating Area (OPAREA) north and west of the Hawaii OPAREA, and at select Navy pierside and harbor locations. However, for this Section 106 consultation, activities would be mainly restricted to the open ocean portions of the SOCAL Range Complex within the SOCAL OPAREA including the waters surrounding San Clemente Island, boat lanes, and anchorages offshore of the Silver Strand Training Complex (SSTC), and the bayside training areas within San Diego Bay. See Enclosures 2 through 6 for maps depicting the various training and testing locations. Activities specific to the Proposed Action include gunnery and explosive exercises as well as the use and maintenance of sonar equipment. The Study Area also includes select pierside locations within San Diego Bay where Navy surface ship and submarine sonar maintenance testing could potentially occur.

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Ser N465/1213
October 02, 2017

PUBLIC PARTICIPATION

Pursuant to 36 CFR 800.8(a), the Navy plans to hold Section 106 meetings in conjunction with the public meetings for the Draft HSTT EIS/OEIS. Comments received regarding historic properties in the APE during the NEPA and Section 106 process will be considered under Section 106.

AREA OF POTENTIAL EFFECT

The APE encompasses open ocean areas in the SOCAL Range Complex within the OPAREA, and boat lanes and anchorages offshore of the SSTC, including the bayside training areas within San Diego Bay, as detailed in Enclosures 2 through 6.

IDENTIFICATION OF HISTORIC PROPERTIES

A majority of the activities for the HSTT will take place within the open ocean areas in the SOCAL Range Complex and OPAREA, and boat lanes and anchorages offshore of the SSTC including the bayside training areas within San Diego Bay. The Study Area contains no identified National Register-listed or eligible sites.

A total of 104 submerged cultural resources including, but not limited to, aircraft, pleasure craft, sport and commercial fishers, and cargo and military vessels have been identified in the waters within the SOCAL Range Complex and OPAREA. In the vicinity of San Clemente Island, these include 35 shipwrecks, 14 unknown or unidentified vessels, 17 aircraft, an anchor, and the abandoned Sea Lab III. Of these 68 submerged resources, 22 are within 12 nautical miles of San Clemente Island and seven are beyond that territorial limit; there is no locational information available for the remaining 34 resources.

On the bay side of the Silver Strand peninsula, three shipwrecks are in or near the training beaches. Unnamed wrecks are recorded in shallow water at the northern end of Delta South beach, in the middle of San Diego Bay, and at the mouth of Fiddler's Cove. The age and cultural value of these wrecks are not known.

On the ocean side of the peninsula, three shipwrecks are located near SSTC training areas; the bark *Narwhale* (sank in 1934); the submarine S-142; and the Subchaser YC689 (sank in 1943). Additionally, the destroyer *USS Hogan* (DD178), a military aircraft (S2F Tracker), and a sunken sailboat are located offshore, south of SSTC and west of the City of Imperial Beach.

A complete inventory of cultural resources has not been completed for all of San Diego Bay. However, a cultural resources review was completed for the San Diego Deepening at Tenth Avenue marine Terminal project. This review identified three known submerged cultural features: a shipwreck (the *Della*), an 1887 marine utility cable, and a sunken Ford Model T. The EDAW study also identified 24 cultural resources with unknown location, but known to be lost in the San Diego area, including schooners, barges, clippers, gas and oil screws, a submarine, a yacht, a bark, a ferry, a ship, and a steamer.

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Ser N465/1213
October 02, 2017

DETERMINATION OF EFFECT

As specified in the HSTT EIS, training and testing activities are expected to continue at current or slightly lower levels in existing localities. These activities have been conducted, or are similar to those that have been historically conducted, for some time with no cultural resources being affected throughout the years. For example, artillery and explosive exercises will take place within the open ocean or near-shore areas of San Clemente Island, away from where there are any known cultural or historical resources. Additionally, the only pierside activities are those associated with Navy surface ship and submarine sonar maintenance testing within San Diego Bay. Pile-driving for Elevated Causeway training at SSTC would subject nearshore sediments to vibration, disruption, and compaction at SSTC and would occur only in the oceanside Boat Lanes 1 through 10 and in the bayside Bravo training area. The proposed activities are consistent with those activities currently conducted in these areas (see Enclosure 6).

Based on the above, and as documented in a letter to your office dated May 3, 2012, the Navy has determined the activities proposed in the HSTT EIS/OEIS would result in a No Historic Properties Affected determination in accordance with the Section 106 implementing regulations under 36 CFR 800.4(d)(1). The Navy requests you reaffirm your previous concurrence with this determination of effect. As defined in 36 CFR 800.5(c), we will assume your concurrence if no objection is received from your office within 30 days of receipt of this letter.

Should you or your staff have any questions or concerns please contact Mr. Richard Bark of Naval Facilities Engineering Command Southwest Cultural Resources Division at (619) 532-4419 or email at richard.bark@navy.mil.

Sincerely,

L. M. FOSTER
By direction

Enclosures: 1. SHPO Concurrence Letter Reference No. USN120509B
2. HSTT Study Area
3. SOCAL Training and Testing Areas
4. San Clemente Island Nearshore Training Areas
5. San Clemente Island Offshore Training Areas
6. Silver Strand Training Complex

STATE OF CALIFORNIA – THE NATURAL RESOURCES AGENCY EDMUND G. BROWN, JR., *Governor*

OFFICE OF HISTORIC PRESERVATION
DEPARTMENT OF PARKS AND RECREATION
1725 23rd Street, Suite 100
SACRAMENTO, CA 95816-7100
(916) 445-7000 Fax: (916) 445-7053
calshpo@parks.ca.gov
www.ohp.parks.ca.gov

October 20, 2017 Reply in Reference To: USN120509B

L. M. Foster
Department of the Navy
United States Pacific Fleet
250 Makalapa Drive
Pearl Harbor, Hawaii 96860-3131

RE: Renewed Consultation, Hawaii-Southern California Training and Testing Activities, Various Ocean Areas, Southern California

Dear Mr. Foster:

The United States Department of the Navy (Navy) is consulting with the State Historic Preservation Officer (SHPO) in order to comply with Section 106 of the National Historic Preservation Act of 1966 (54 U.S.C. § 306108), as amended, and its implementing regulations at 36 CFR Part 800. The Navy requests SHPO concurrence with a finding of no historic properties affected.

The Navy plans to renew training and testing activities in the waters off of Southern California, Hawaii, and the Open Ocean Transit corridor between these two regions. The majority of activities off of California will occur within the Southern California Operating Area (OPAREA), including the waters surrounding San Clemente Island, boat lanes and anchorages offshore of the Silver Strand Training Complex (SSTC), and the bayside training areas within San Diego Bay. Activities specific to this undertaking include gunnery and explosive exercises as well as the use and maintenance of sonar equipment. The project area also includes select pier side locations within San Diego Bay where Navy surface ship and sonar maintenance testing occurs.

The Navy defines the Area of Potential Effects (APE) for this activity as the open ocean areas in the Southern California Range Complex with the OPAREA, and boat lanes and anchorages offshore of the SSTC, including the bayside training areas within San Diego Bay. In addition to your letter, you have provided maps and a CDR containing environmental studies undertaken in the project area.

Submerged cultural resources in the waters around San Clemente Island include pleasure craft, sport and commercial fishers, cargo ships, and military vessels. Of these resources, twenty-two are sited within twelve nautical miles of San Clemente Island and seven are beyond the territorial limit.

October 20, 2017 Page 2 of 2

On the bay side of Silver Strand peninsula, three shipwrecks are in or near the training beaches. Unnamed wrecks are sited in shallow water at the northern end of Delta South Beach, in the middle of San Diego Bay, and at the mouth of Fiddler's Cove. The ages and cultural value of these wrecks are unknown.

On the ocean side of the peninsula, three shipwrecks are located near SSTC training areas: the bark Narwhale (sank in 1934); the submarine S-142; and the Subchaser YC689 (sank in 1943). The destroyer USS Hogan, a military aircraft, and a sunken sailboat are located offshore, south of SSTC and west of the City of Imperial Beach.

Known cultural resources in San Diego Bay have not been comprehensively inventoried. However, cultural resources were reviewed for the San Diego Deepening at Tenth Avenue Marine Terminal Project (EDAW 2005). This review identified three known submerged cultural features: a shipwreck (identified as the *Della*), an 1887 marine utility cable, and a sunken Ford Model T. The EDAW study identified an additional twenty-four resources known to have been lost in the San Diego area, including schooners, barges, a submarine, clippers, gas and oil screws, a yacht, a bark, a ferry, a ship, and a steamer.

Training and testing activities are consistent with actions currently conducted in the above-referenced areas. For example, artillery and explosive exercises will take place within the Open Ocean or near-shore areas, away from where there are any known cultural or historical resources. Pile driving for elevated causeway training at STC will subject near shore sediments to vibration, disruption, and compaction at SSTC and will occur only in the Oceanside Boat Lanes 1-10 and in the Bayside Bravo Training Area. Proposed activities area consistent with activities currently conducted in these areas.

Having reviewed your submittal, SHPO concurs with the Navy's Finding of Effect. SHPO is also of the opinion that the APE is adequate to account for direct and indirect effects to historic properties. Please be advised that in the event of a change in project description or an inadvertent discovery, The Navy may have additional responsibilities under 36 CFR Part 800.

Should you require additional information, please contact State Historian Tristan Tozer at (916) 445-7027 or at Tristan.Tozer@parks.ca.gov.

Sincerely,

Julianne Polanco
State Historic Preservation Officer

J.6.2 HAWAII

DEPARTMENT OF THE NAVY
COMMANDER
UNITED STATES PACIFIC FLEET
250 MAKALAPA DRIVE
PEARL HARBOR, HAWAII 96860-3131

IN REPLY REFER TO:
5090
Ser N465/1212
October 02, 2017

Elaine Jackson-Retondo
National Park Service, Pacific West Region
333 Bush Street, Suite 500
San Francisco, CA 94104-2828

Dear Ms. Jackson-Retondo:

SUBJECT: NATIONAL HISTORIC PRESERVATION ACT, SECTION 106 CONSULTATION FOR PROPOSED HAWAII-SOUTHERN CALIFORNIA TRAINING AND TESTING ACTIVITIES

In accordance with 36 CFR Part 800, the United States Department of the Navy is initiating National Historic Preservation Act Section 106 consultation regarding a proposal to conduct military readiness activities in the Hawaii-Southern California Training and Testing (HSTT) Study Area. The Navy determined that the proposed project is an undertaking as defined in 36 CFR 800.16(y). The Navy is consulting with the National Park Service because Pearl Harbor, which is listed in the National Register as a National Historic Landmark, is located within the HSTT Study Area.

DESCRIPTION OF UNDERTAKING

The proposed undertaking, which is also undergoing National Environmental Policy Act (NEPA) Environmental Impact Statement/Overseas Environmental Impact Statement (EIS/OEIS) review is to conduct military readiness activities, which includes the use of active sonar and explosives, primarily within existing range complexes and operation areas (OPAREAs) at-sea off the coasts of Hawaii and Southern California (SOCAL), on the high seas during vessel transit between these areas and at select Navy pierside and harbor locations (Enclosure 1).

The Navy previously completed Section 106 consultation in 2012 (Ser N01CE1/0621 dated 3 May 2012) and an EIS/OEIS in December 2013 for training and testing activities in the same HSTT Study Area; the updated analysis will re-evaluate potential environmental impacts associated with ongoing activities addressed in the 2013 EIS/OEIS. Although this undertaking includes both the SOCAL Range Complex and the Hawaii Range Complex (HRC), this Section 106 letter is limited to consultation for the HRC since a separate consultation has been prepared for California.

5090
Ser N465/1212
October 02, 2017

Nearly all of the training and testing activities in the HRC would be conducted within the Hawaii OPAREA, that portion of the range complex immediately surrounding the island chain from Hawaii to Kauai (Enclosure 2). Activities include gunnery and explosive exercises as well as the use and maintenance of sonar equipment. Surface ship and submarine sonar maintenance and testing could potentially occur in select pierside locations in Pearl Harbor.

PUBLIC PARTICIPATION

Pursuant to 36 CFR 800.8(a), the Navy plans to solicit input from the public by holding Section 106 meetings in conjunction with the public meetings for the Draft HSTT EIS/OEIS. Comments regarding historic properties in the area of potential effect (APE) that are received during the NEPA and Section 106 process will be considered under Section 106.

AREA OF POTENTIAL EFFECT

The APE would encompass the HRC, which is composed of the Hawaii OPAREA and the Temporary Operating Area as shown in Enclosure 1.

IDENTIFICATION OF HISTORIC PROPERTIES

A majority of the proposed training and testing activities for the HRC will take place within open ocean areas of the Hawaii OPAREA. Submerged cultural resources, which include shipwrecks and plane wrecks, have been documented within these waters.

The Papahanaumokuakea Marine National Monument and World Heritage Site, an area having both cultural and ecological significance, is located northwest of the Hawaii OPAREA within the Temporary OPAREA (Enclosure 3). The majority of training and testing activities are conducted east of Nihoa Island in the Hawaii OPAREA, with only a few activities occurring inside the eastern edge of the monument boundaries. These activities include training during transit as well as sonar and periodic multi-range test events that include support from the Pacific Missile Range Facility (PMRF). Explosives are not used in the Papahanaumokuakea Marine National Monument.

The ocean around the Papahanaumokuakea Marine National Monument can be treacherous for ships due to submerged reefs, seamounts, and shoals. Some of the earliest known shipwrecks in Hawaii are located at Kure Atoll and include the *USS Saginaw*, which sank in 1870 and the remains of what may be the whaleship *Parker* that sank in 1842. The *Two Brothers* whaleship out of Nantucket sank on February 11, 1823 off the French Frigate Shoals. This whaleship was listed on the Hawaii State Register in March 2017.

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Ser N465/1212
October 02, 2017

Midway Atoll is also located within Papahanaumokuakea Marine National Monument. The atoll was first identified by Captain N.C. Brooks of the *Gambia* in 1859. Construction of Naval Air Station (NAS) Midway began in 1940. Japan attacked NAS Midway on December 7, 1941, coinciding with the attack on Hawaii, and then again in 1942. This latter attack, known as the Battle of Midway, was one of the most decisive naval battles of World War II. The National Memorial to the Battle of Midway was designated in 2000 and includes aircraft and ships sunk during the battle, such as P-40K Warhawks, F2A-3 Buffaloes, and F4U Corsairs recently recorded by National Oceanic and Atmospheric Administration's Maritime Heritage Team.

Papahanaumokuakea Marine National Monument also includes islands that have religious and cultural significance, such as Mokumanamana Island (Necker Island), which is known for its *wahi pana* (religious places). The proposed training activities are located within the open ocean waters and avoid these islands.

Pearl Harbor is also a historically important area in Hawaii. Traditionally, Pearl Harbor was called Ka-awa-lau-o-pu'uloa, which can be translated as the many harbored sea of Pu'uloa or the leaf-shaped lagoon of Pu'uloa. There are traditional references to fishponds that were constructed in the harbor as well as information about the abundant marine resources such as shellfish and fish. Traditional Hawaiian fishponds were constructed along the shores between the 14th and 19th centuries in fairly protected areas to raise fish.

Development of Pearl Harbor as a Navy base began in 1908. Pearl Harbor is most known as a target in the Japanese attack on Oahu on December 7, 1941. Pearl Harbor was designated as a National Historic Landmark due to its role in the attack (Site 50-80-13-9992). Other losses during the attack are situated within the waters around Oahu and include the flying boats (PBYs) from NAS Kaneohe that sank in Kaneohe Bay.

DETERMINATION OF EFFECT

With the initiation of the Section 106 process for the proposed HSTT EIS/OEIS, the Navy is seeking information from consulting parties and native Hawaiian organizations, to help identify historic properties in the APE in addition to those identified during the 2012 Section 106 consultations (30 CFR 800.4) and discussed in this letter. Following identification and evaluation of historic properties, the Navy, in consultation with the State Historic Preservation Officer (SHPO) and native Hawaiian organizations that attach religious and cultural significance to the identified property, will assess the effects of the undertaking on historic properties in a manner consistent with the standards and criteria of 30 CFR 800.4 through 800.5. The Navy does not anticipate that the undertaking will adversely affect historic properties because the action will occur in the open ocean; and falling debris will not damage historic properties, such

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October 02, 2017

as shipwrecks, within the APE. Potential effects within the marine national monument could include disruptions to cultural voyaging and wayfinding; however, these would be considered a temporary impact to cultural navigation because both Navy and cultural voyaging activities are considered transitory, and there would be minimal to no overlap. Following the public meetings, the Navy will inform SHPO, native Hawaiian organizations, and consulting parties of any additional information regarding the identification of historic properties.

Should you or your staff have any questions or concerns please contact Ms. Coral Rasmussen of Naval Facilities Engineering Command Pacific Cultural Resources Division at (808) 472-1432 or email at coral.rasmussen@navy.mil.

Sincerely,

Mary M. Foster

L. M. FOSTER
By direction

Enclosures: 1. HSTT Study Area
2. Hawaii OPAREA
3. Papahanaumokuakea Marine National Monument

4

DEPARTMENT OF THE NAVY
COMMANDER
UNITED STATES PACIFIC FLEET
250 MAKALAPA DRIVE
PEARL HARBOR, HAWAII 96860-3131

IN REPLY REFER TO:
5090
Ser N465/1214
October 02, 2017

Dr. Alan Downer
Deputy State Historic Preservation Officer
Department of Land and Natural Resources
Kakuihewa Building, Room 555
601 Kamokila Boulevard
Kapolei, HI 96707

Dear Dr. Downer:

SUBJECT: NATIONAL HISTORIC PRESERVATION ACT, SECTION 106 CONSULTATION FOR PROPOSED HAWAII-SOUTHERN CALIFORNIA TRAINING AND TESTING ACTIVITIES

In accordance with 36 CFR Part 800, the United States Department of the Navy is initiating National Historic Preservation Act Section 106 consultation regarding a proposal to conduct military readiness activities in the Hawaii-Southern California Training and Testing (HSTT) Study Area. The Navy determined that the proposed project is an undertaking as defined in 36 CFR 800.16(y).

DESCRIPTION OF UNDERTAKING

The proposed undertaking, which is also undergoing National Environmental Policy Act (NEPA) Environmental Impact Statement/Overseas Environmental Impact Statement (EIS/OEIS) review is to conduct military readiness activities, which includes the use of active sonar and explosives, primarily within existing range complexes and operation areas (OPAREAs) at sea off the coasts of Hawaii and Southern California (SOCAL), on the high seas during vessel transit between these areas, and at select Navy pierside and harbor locations (Enclosure 1).

The Navy previously completed Section 106 consultation in 2012 (Ser N01CE1/0621 dated 3 May 2012) and an EIS/OEIS in December 2013 for training and testing activities in the same HSTT Study Area; the updated analysis will re-evaluate potential environmental impacts associated with ongoing activities addressed in the 2013 EIS/OEIS. Although this undertaking includes both the SOCAL Range Complex and the Hawaii Range Complex, this Section 106 letter is limited to consultation for the Hawaii Range Complex since a separate consultation has been prepared for California.

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Nearly all of the training and testing activities in the Hawaii Range Complex (HRC) would be conducted within the Hawaii OPAREA, that portion of the range complex immediately surrounding the island chain from Hawaii to Kauai (Enclosure 2). Activities include gunnery and explosive exercises as well as the use and maintenance of sonar equipment. Surface ship and submarine sonar maintenance and testing could potentially occur in select pierside locations in Pearl Harbor.

PUBLIC PARTICIPATION

Pursuant to 36 CFR 800.8(a), the Navy plans to solicit input from the public by holding Section 106 meetings in conjunction with the public meetings for the Draft HSTT EIS/OEIS. Comments regarding historic properties in the area of potential effect (APE) that are received during the NEPA and Section 106 process will be considered under Section 106.

AREA OF POTENTIAL EFFECT

The APE would encompass Hawaii Range Complex, which is composed of the Hawaii OPAREA and the Temporary Operating Area as shown in Enclosure **1**.

IDENTIFICATION OF HISTORIC PROPERTIES

A majority of the proposed training and testing activities for the HRC will take place within open ocean areas of the Hawaii OPAREA. Submerged cultural resources, which include shipwrecks and plane wrecks, have been documented within these waters.

The Papahanaumokuakea Marine National Monument and World Heritage Site, an area having both cultural and ecological significance, is located northwest of the Hawaii OPAREA within the Temporary Operating Area (Enclosure 3). The majority of training and testing activities are conducted east of Nihoa Island in the Hawaii OPAREA, with only a few activities occurring inside the eastern edge of the monument boundaries. These activities include training during transit as well as sonar and periodic multi-range test events that include support from the Pacific Missile Range Facility. Explosives are not used in the Papahanaumokuakea Marine National Monument.

The ocean around the Papahanaumokuakea Marine National Monument can be treacherous for ships due to submerged reefs, seamounts, and shoals. Some of the earliest known shipwrecks in Hawaii are located at Kure Atoll and include the *USS Saginaw*, which sank in 1870 and the remains of what may be the whaleship *Parker* that sank in 1842. The *Two Brothers* whaleship out of Nantucket sank on February 11, 1823 off the French Frigate Shoals. This whaleship was listed on the Hawaii State Register in March 2017.

Midway Atoll is also located within Papahanaumokuakea Marine National Monument. The atoll was first identified by Captain N.C. Brooks of the *Gambia* in 1859. Construction of Naval Air Station (NAS) Midway began in 1940. Japan attacked NAS Midway on December 7, 1941, coinciding with the attack on Hawaii, and then again in 1942. This latter attack, known as the

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October 02, 2017

Battle of Midway, was one of the most decisive naval battles of World War II. The National Memorial to the Battle of Midway was designated in 2000 and includes aircraft and ships sunk during the battle, such as P-40K Warhawks, F2A-3 Buffaloes, and F4U Corsairs recently recorded by National Oceanic and Atmospheric Administration's Maritime Heritage Team.

Papahanaumokuakea Marine National Monument also includes islands that have religious and cultural significance, such as Mokumanamana Island (Necker Island), which is known for its *wahi pana* (religious places). The proposed training activities are located within the open ocean waters and avoid these islands.

Pearl Harbor is also a historically important area in Hawaii. Traditionally, Pearl Harbor was called Ka-awa-lau-o-pu'uloa, which can be translated as the many harbored sea of Pu'uloa or the leaf-shaped lagoon of Pu'uloa. There are traditional references to fishponds that were constructed in the harbor as well as information about the abundant marine resources such as shellfish and fish. Traditional Hawaiian fishponds were constructed along the shores between the 14th and 19th centuries in fairly protected areas to raise fish.

Development of Pearl Harbor as a Navy base began in 1908. Pearl Harbor is most known as a target in the Japanese attack on Oahu on December 7, 1941. Pearl Harbor was designated as a National Historic Landmark due to its role in the attack (Site 50-80-13-9992). Other losses during the attack are situated within the waters around Oahu and include the flying boats (PBYs) from NAS Kaneohe that sank in Kaneohe Bay.

DETERMINATION OF EFFECT

With the initiation of the Section 106 process for the proposed HSTT EIS/OEIS, the Navy is seeking information from consulting parties and native Hawaiian organizations, to help identify historic properties in the APE in addition to those identified during the 2012 Section 106 consultations (30 CFR 800.4) and discussed in this letter. Following identification and evaluation of historic properties, the Navy, in consultation with the State Historic Preservation Officer (SHPO) and native Hawaiian organizations that attach religious and cultural significance to the identified property, will assess the effects of the undertaking on historic properties in a manner consistent with the standards and criteria of 30 CFR 800.4 through 800.5. The Navy does not anticipate that the undertaking will adversely affect historic properties because the action will occur in the open ocean; and falling debris will not damage historic properties, such as shipwrecks, within the APE. Potential effects within the marine national monument could include disruptions to cultural voyaging and wayfinding; however, these would be considered a temporary impact to cultural navigation because both Navy and cultural voyaging activities are considered transitory, and there would be minimal to no overlap. Following the public meetings, the Navy will inform SHPO, native Hawaiian organizations, and consulting parties of any additional information regarding the identification of historic properties.

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Ser N465/1214
October 02, 2017

Should you or your staff have any questions or concerns please contact Ms. Coral Rasmussen of Naval Facilities Engineering Command Pacific Cultural Resources Division at (808) 472-1432 or email at coral.rasmussen@navy.mil.

Sincerely,

L. M. FOSTER
By direction

Enclosures: 1. HSTT Study Area
2. Hawaii OPAREA
3. Papahanaumokuakea Marine National Monument

Copy to:
Dr. Kamana'opono Crabbe, Office of Hawaiian Affairs
Mr. Shad Kane, Oahu Council of Hawaiian Civic Clubs

4

DAVID Y. IGE
GOVERNOR OF
HAWAII

SUZANNE D. CASE
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

ROBERT K. MASUDA
FIRST DEPUTY

JEFFREY T. PEARSON, P.E.
DEPUTY DIRECTOR - WATER

AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
BUREAU OF CONVEYANCES
COMMISSION ON WATER RESOURCE MANAGEMENT
CONSERVATION AND COASTAL LANDS
CONSERVATION AND RESOURCES ENFORCEMENT
ENGINEERING
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
KAHOOLAWE ISLAND RESERVE COMMISSION
LAND
STATE PARKS

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

STATE HISTORIC PRESERVATION DIVISION
KAKUHIHEWA BUILDING
601 KAMOKILA BLVD, STE 555
KAPOLEI, HAWAII 96707

November 6, 2017

IN REPLY REFER TO:
Log No.: 2017.02245
Doc. No.: 1711SH02
Archaeology

Larry M. Foster
Department of the Navy
Commander
United States Pacific Fleet
250 Makalapa Drive
Pearl Harbor, Hawaii 96860-3131

Dear Larry Foster:

SUBJECT: **National Historic Preservation Act (NHPA) Section 106 –**
Consultation for Proposed Hawaii-Southern California Training and Testing Activities
Ref. No. 5090 Ser N465/1214
Main Hawaiian Islands
TMK: offshore

The State Historic Preservation Officer (SHPO) received a letter dated October 2, 2017 from the United States Department of the Navy (Navy) initiating consultation for a proposal to conduct military readiness activities in the Hawaii-Southern California Training and Testing (HSTT) Study Area. The State Historic Preservation Division (SHPD) received this submittal on October 9, 2017 (Log No. 2017.02245). The SHPD also received a letter dated October 2, 2017 on October 20, 2017 from the Navy informing our office that a Draft Environmental Impact Statement/Overseas Environmental Impact Statement (EIS/OEIS) would be prepared to re-evaluate potential environmental impacts associated with the proposed project (5090 Ser N465/1210, SHPD Log No. 2017.02339).

The Navy has determined the proposed project is an undertaking as defined in 36 CFR 800.16(y). The undertaking includes gunnery and explosive exercises as well as the use and maintenance of sonar equipment, primarily within existing range complexes and operation areas (OPAREAs) at sea off the coasts of Hawaii and Southern California (SOCAL), on the high seas during vessel transit between these areas, and at selected Navy pierside and harbor locations. Although this undertaking includes both the Hawaii Range Complex (HRC) and the SOCAL Range Complex, the letter submitted to SHPD is limited to consultation for the Hawaii Range Complex and a separate consultation letter has been prepared for California.

According to the submittal, nearly all the training and testing activities in the HRC would be conducted within the Hawaii OPAREA, that portion of the range complex immediately surrounding the island chain from Hawai'i to Kaua'i. Surface ship and submarine sonar maintenance and testing could potentially occur in select pierside locations in Pearl Harbor. Submerged cultural resources, including shipwrecks and plane wrecks, have been documented within these waters. The APE has been defined to encompass the HRC, which is composed of the Hawaii OPAREA and the Temporary Operating Area.

The Papahanaumokuakea Marine National Monument and World Heritage Site, an area having both cultural and ecological significance, is located northwest of the Hawaii OPAREA within the Temporary Operating Area. The activities anticipated within the monument boundaries include training during transit as well as sonar and periodic

multi-range test events that include support from the Pacific Missile Range Facility. The subject consultation letter states that explosives are not used in the Papahanaumokuakea Marine National Monument.

Additional historic properties within the APE include some of the earliest shipwrecks in Hawaii such as the *USS Saginaw*, which sank in 1870, and the remains of what may be the whaleship *Parker*, which sank in 1842. Also included is the *Two Brothers* whaleship which was listed on the Hawai'i State Register of Historic Places and on the National Register of Historic Places in 2017. Midway Atoll, a National Wildlife Refuge, is located within the Papahanaumokuakea Marine National Monument and was first identified by Captain N.C. Brooks of the *Gambia* in 1859. The construction of Naval Air Station (NAS) Midway began in 1940 and was attacked by Japan on December 7, 1941 and again in 1942. The latter attack, known as the Battle of Midway was one of the most decisive naval battles of World War II. The National Memorial to the Battle of Midway was designated in 2000 and includes aircraft and ships sunk during the battle. The Papahanaumokuakea Marine National Monument also contains islands with religious and cultural significance to native Hawaiians. The proposed training activities are located within the open ocean waters and avoid these islands.

Pearl Harbor is also a historically important area in Hawai'i. There are references to traditional Hawaiian fishponds that were constructed within the harbor. Development of Pearl Harbor as a Navy base began in 1908. Pearl Harbor is best known as a target in the Japanese attack on O'ahu on December 7, 1941 and was subsequently designated a National Historic Landmark (State Inventory of Historic Places (SIHP) Site 50-80-13-9992).

Both Navy letters (Log Nos. 2017.02339 and 2017.02245) request information to help identify historic properties in the APE in addition to those already identified and discussed in the letter. Following the upcoming public meetings to discuss this undertaking, the Navy will inform the SHPO, Native Hawaiian Organizations (NHOs), and other consulting parties of any additional information regarding the identification of historic properties.

The SHPO looks forward to continuing consultation for the proposed undertaking. **Also, the SHPD requests a list of the tax map keys (TMKs) that may be located within the APE.**

The Department of the Navy is the office of record for this undertaking. Please maintain a copy of this letter with your environmental review record for this undertaking.

Please contact Stephanie Hacker, Oahu Archaeologist, at (808) 692-8046 or at Stephanie.Hacker@hawaii.gov for matters regarding archaeological resources (nearshore and submerged) or this letter.

Aloha,



Alan S. Downer, PhD
Administrator, State Historic Preservation Division
Deputy State Historic Preservation Officer

cc: Suzanne Case, Chair, Department of Land and Natural Resources, Suzanne.case@hawaii.gov
Coral Rasmussen, Naval Facilities Engineering Command Pacific Cultural Resources Division, coral.rasmussen@navy.mil
Alex Stone, Naval Facilities Engineering Command Pacific Cultural Resources Division, alexander.stone@navy.mil

DEPARTMENT OF THE NAVY
COMMANDER
UNITED STATES PACIFIC FLEET
250 MAKALAPA DRIVE
PEARL HARBOR, HAWAII 96860-3131

IN REPLY REFER TO:
5090
Ser N465/0491
March 22, 2018

Dr. Alan Downer
Deputy State Historic Preservation Officer
Department of Land and Natural Resources
Kakuihewa Building, Room 555
601 Kamokila Boulevard
Kapolei, HI 96707

Dear Dr. Downer:

SUBJECT: NATIONAL HISTORIC PRESERVATION ACT, SECTION 106 CONSULTATION FOR PROPOSED HAWAII-SOUTHERN CALIFORNIA TRAINING AND TESTING ACTIVITIES

United States Department of the Navy is continuing consultation with your office in compliance with Section 106 of the National Historic Preservation Act regarding the proposal to continue military readiness activities in the Hawaii-Southern California Training and Testing (HSTT) Study Area. The Navy sent the initial consultation letter (Ser N465/1214) in October 2017. A response was received from your office in November 2017 (Log No.:2017.02245/Doc. No.: 1711SH02 dated November 6, 2017) requesting additional information.

As indicated in the previous Section 106 consultation letter, the proposed undertaking is to continue military readiness activities primarily within existing range complexes and operation areas (OPAREAs) at sea off the coasts of Hawaii and Southern California (SOCAL), on the high seas during vessel transit between these areas, and at select Navy pier-side and harbor locations (Enclosure 1).

The Draft HSTT Environmental Impact Statement underwent public review in accordance with the National Environmental Policy Act (NEPA) October 13 through December 12, 2018. Public meetings were held on Oahu (Nov. 6, 2017), Maui (Nov. 7), Kauai (Nov. 8), and the Big Island (Nov. 9) to, among other things, seek information from potential consulting parties and native Hawaiian organizations (NHO). Further, the Navy's goal was to receive input identifying historic properties in the HSTT area of potential effect (APE) beyond those identified during the 2012 Section 106 consultations. During the meetings, a request was made from Kealoha Pisciotta on behalf of Kai Palaoa and Mauna Kea Anina Hou, to participate in Section 106 consultations. They identified a sacred site, Pu'u Kohala-Hill of the Whale, which is located

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March 22, 2018

along the Kohala Coast, not at sea, and thus not in our APE. Further, they mentioned an underwater heiau, and other cultural and religious sites with undetermined locations. Requests for additional Section 106 consultation were made by Paul Lawalawa Day, Hanalei Fegerstrom, and Shelley Stephens (Mahi-hanai).

In addition, your office requested a list of tax map keys (TMKs) that may be located within the APE. The study area is at sea, where there are no TMKs assigned, but does include pier-side locations in Pearl Harbor, which is TMK (1)9-9-001:008.

The Navy will be hosting a Section 106 consultation meeting on Thursday, April 12, 2018, 2:00-4:00 PM, at the Military and Family Support Center Pearl Harbor, Room 262, 4827 Bougainville Drive, Honolulu, Hawaii 96818, to meet with the SHPO, NHOs, and potential consulting parties to discuss their concerns about how our undertaking may affect historic properties, learn about previously unidentified historic properties, including those of traditional religious and cultural importance, and participate in the resolution of potential adverse effects. Being that consulting parties are potentially located on different islands, a teleconference number will be provided to accommodate people on the outer Islands or U.S.

Following the Section 106 consultation meeting(s), the Navy will be better able to assess the effects of the undertaking on historic properties in a manner consistent with the standards and criteria of 36 CFR 800.4 through 800.5.

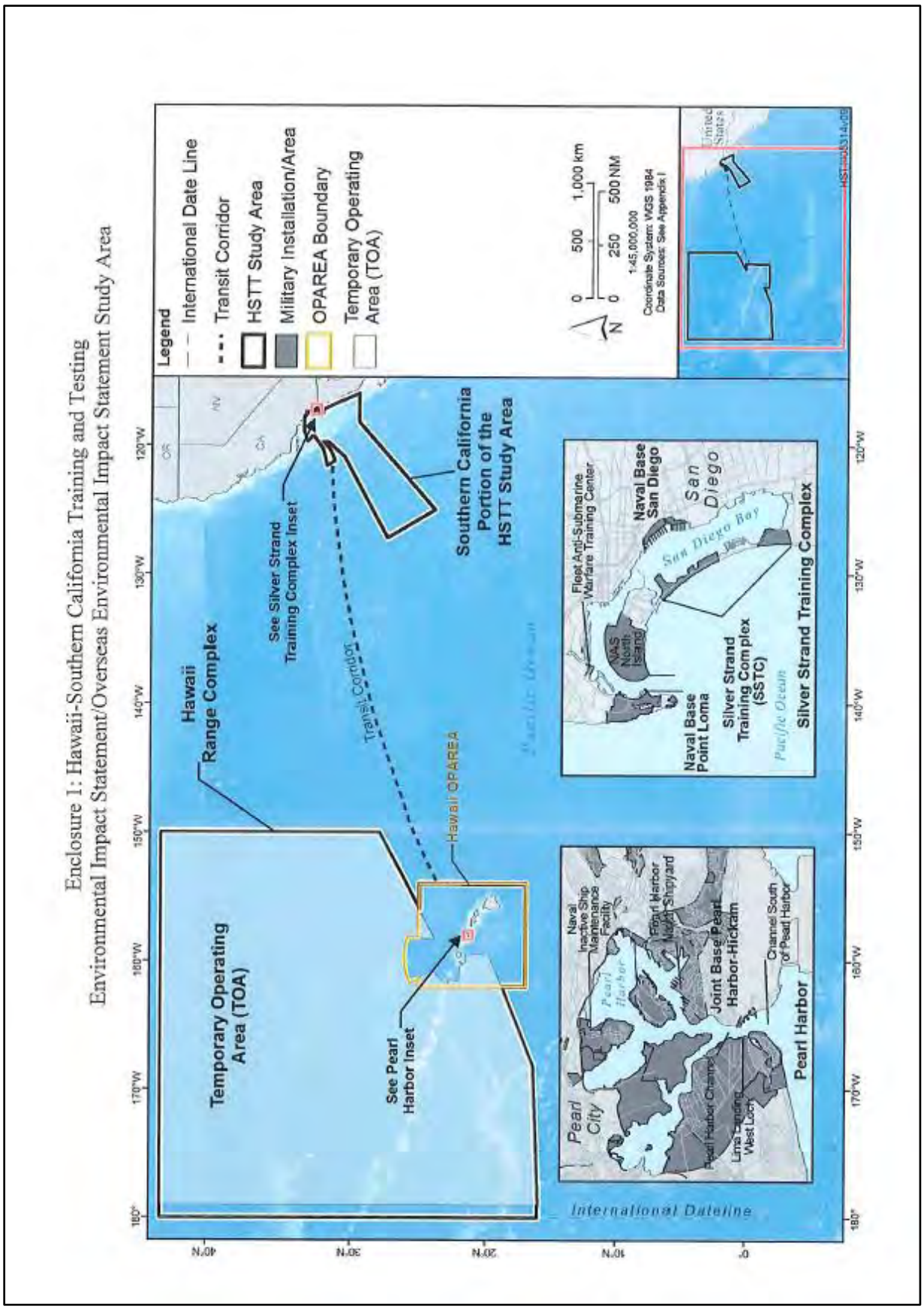
Should you or your staff have any questions or concerns please contact Ms. Coral Rasmussen of Naval Facilities Engineering Command Pacific Cultural Resources Division at (808) 472-1432 or email at coral.rasmussen@navy.mil.

Sincerely,

L. M. FOSTER
By direction

Copy to:
Dr. Kamana'opono Crabbe, Office of Hawaiian Affairs
Mr. Shad Kane, Oahu Council of Hawaiian Civic Clubs

2


Enclosure 1: Hawaii-Southern California Training and Testing
Environmental Impact Statement/Overseas Environmental Impact Statement Study Area
Legend
International Date Line
Transit Corridor
HSTT Study Area
Military Installation/Area
OPAREA Boundary
Temporary Operating Area (TOA)
0 500 1,000 km
0 250 500 NM
1:45,000,000
Coordinate System: WGS 1984
Data Sources: See Appendix I
Hawaii Range Complex
Temporary Operating Area (TOA)
See Pearl Harbor Inset
Hawaii OPAREA
Transit Corridor
See Silver Strand Training Complex Inset
Southern California Portion of the HSTT Study Area
Fleet Anti-Submarine Warfare Training Center
Naval Base San Diego
San Diego
San Diego Bay
NAS North Island
Naval Base Point Loma
Silver Strand Training Complex (SSTC)
Silver Strand Training Complex
Pacific Ocean
Naval Inactive Ship Maintenance Facility
Pearl Harbor Naval Shipyard
Joint Base Pearl Harbor-Hickam
Channel South of Pearl Harbor
Pearl City
Pearl Harbor Channel
Lima Landing
West Loch
Pearl Harbor
International Dateline
OR
CA
NV
120°W
130°W
140°W
150°W
160°W
170°W
180°
40°N
30°N
20°N
10°N
0°

DEPARTMENT OF THE NAVY
COMMANDER
UNITED STATES PACIFIC FLEET
250 MAKALAPA DRIVE
PEARL HARBOR, HAWAII 96860-3131

IN REPLY REFER TO:
5090
Ser N465/1411
October 04, 2018

Dr. Alan Downer
Deputy State Historic Preservation Officer
Department of Land and Natural Resources
Kakuihewa Building, Room 555
601 Kamokila Boulevard
Kapolei, HI 96707

Dear Dr. Downer:

SUBJECT: NATIONAL HISTORIC PRESERVATION ACT SECTION 106 CONSULTATION FOR PROPOSED HAWAII-SOUTHERN CALIFORNIA TRAINING AND TESTING ACTIVITIES

United States Department of the Navy is continuing consultation with your office in compliance with Section 106 of the National Historic Preservation Act regarding the proposal to conduct military readiness activities in the Hawaii-Southern California Training and Testing (HSTT) Study Area. Although the undertaking includes both the Southern California (SOCAL) Range Complex and the Hawaii Range Complex (HRC), this Section 106 letter is limited to consultation for the HRC since a separate consultation was conducted for SOCAL. The California State Historic Preservation Officer concurred with the Navy's determination on the proposed action in the SOCAL portion of the HSTT Study Area on 20 October 2017. The Navy initiated consultation for the HRC on 2 October 2017 (Ser N465/1214) and has held seven meetings, which include in-person meetings on Oahu, Kaua'i, Maui, and Hawai'i Island (both Hilo and Kona).

PROJECT DESCRIPTION

As indicated in previous correspondence, the proposed undertaking, which is concurrently undergoing National Environmental Policy Act (NEPA) Environmental Impact Statement/ Overseas Environmental Impact Statement (EIS/OEIS) review, is to conduct military readiness activities primarily within existing range complexes and operation areas (OPAREAs) at sea off the coasts of Hawai'i and SOCAL, on the high seas during vessel transit between these areas, and at select Navy pier side and harbor locations. No terrestrial activities are included as part of this undertaking. Since proposed training and testing activities are located at sea, tax map keys (TMKs) are not included in this letter.

The Navy has divided the Hawaii portions of the training area into four zones that reflect the different uses for consultation purposes.

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Zone 1 consists of training and testing activities outside the U.S. territorial waters (>12 nautical miles from shore) [Enclosure 1]. Training and testing in this zone includes a transit corridor between California and Hawai'i. Zone 1 is outside U.S. territorial waters and therefore outside the jurisdiction of Section 106 Consultation. Zone 1 World Heritage sites and any properties under another country's jurisdiction are addressed through 16 U.S.C § 470a-2 (see the discussion in the Cultural Resources section of the EIS/OEIS regarding World Heritage Sites).

Zone 2 consists of training and testing activities within designated military training ranges and testing locations [Enclosure 2]. The training and testing areas are shown in Enclosures 3 to 6. These training and testing areas were established more than three decades ago. Portions of the Shallow Water Training Range off Kaua'i and Kingfisher Training Minefield off Ni'ihau are within U.S. territorial waters. Barbers Point Underwater Range, Puuloa Underwater Range, Ewa Training Minefield, and the amphibious landing at the boat ramp at Kawaihae Harbor on Hawai'i Island and the beaches at Marine Corps Base Hawaii (MCBH) and Marine Corps Training Area Bellows (MCTAB) off O'ahu are within U.S. territorial waters. Portions of Fleet Operational Readiness Accuracy Check Site (FORACS) and Surface Ship Radiated Noise Measurement System off O'ahu area are also within U.S. territorial waters, as are the Kahoolawe Sub Training Minefield and the Hawaii Area Tracking System (HATS) off Maui and Kaho'olawe that use sonar to track submarine threats.

Zone 3 consists of the non-military controlled area within U.S. territorial waters around the main Hawaiian Islands [see Enclosure 3-6]. This area supports near shore vessel/boat movements and personnel insertion/extraction activities with swimmers and divers [see Enclosure 2]. Further from shore, typically beyond 3 nautical miles (nm) and within U.S. territorial waters, various military training and testing activities, such as small and medium caliber weapons firing (non-explosive), anti-submarine warfare, and mine warfare occur in areas where supported by appropriate water depths. Training and testing activities included in the HSTT EIS/OEIS in Zone 3 within 3 nm of shore include in water actions such as vessel/boat movements and personnel insertion/extraction activities. Generally speaking, ships and submarines maneuver in deep water and do not transit the near shore region.

Zone 4 is the area within the boundaries of the Papahānaumokuākea Marine National Monument. The Navy transits through the southeastern portion of the monument boundary on its way to and from the Western Pacific in an area of open water. The Navy does not transit between the islands or plan training and testing activities within the monument [see Enclosure 1].

AREA OF POTENTIAL EFFECT

Pursuant to 36 CFR 800.4(a)(1), the Navy established an area of potential effect (APE) to identify historic properties in the study area. The APE is defined as the area between the high tide line along the shoreline in Hawai'i and 12 nm, which is the outer boundary of U.S. territorial waters.

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October 04, 2018

IDENTIFICATION OF HISTORIC PROPERTIES

The Section 106 consultation has included consultation with Native Hawaiian Organizations (NHOs), interested parties with a demonstrated interest in the undertaking, and the public per 36 CFR 800.2(c)(d). In addition to the Navy's established consultation list, other consulting parties were identified through the U.S. Department of the Interior's Office of Native Hawaiian Relations NHO Notification List. The Navy conferred with the Office of Hawaiian Affairs regarding the identified NHOs. Additional consulting parties were identified throughout the process, including the NEPA public meetings held on Oahu (Nov 6, 2017), Maui (Nov 7, 2017), Kauai (Nov 8, 2017), and the Big Island (Nov 9, 2017) and during the Section 106 consultation meeting invitations.

During the consultation meetings, the Navy sought information from NHOs, consulting parties and other individuals and organizations to assist in identifying historic properties pursuant to §800.4. While no additional specific information identifying historic properties was shared during the consultation process, participants shared views on issues they felt were related to the undertaking's potential effects. These views, which included a close attachment to the ocean, will help inform the Navy's decision making and are included in the Cultural Resources section of the HSTT EIS/OEIS. Native Hawaiians consider themselves a people of the ocean and attribute their origins to coral polyps that live in the water. They also consider ocean creatures to be their kin or ʻaumakua. It was often stated during the consultations that the waters and the islands within them are sacred. In addition, there are fresh water springs and fishing areas and stone markers, called koʻa located in the water that are considered culturally significant. They indicated that these areas are secret and despite our assurance of confidentiality, their locations were ultimately not divulged during consultation.

Historic property research was conducted at the State Historic Preservation Division library and includes historic properties listed on the Hawaii State Register [Enclosures 7 and 8]. Historic properties listed on the National Register of Historic Places (NRHP) were obtained from the NRHP website and submerged cultural resources information was obtained from the Maritime Heritage Coordinator at National Oceanic and Atmospheric Administration (NOAA).

Historic Properties within Zones

The APE is divided into four zones that reflect the different uses of the area; these zones also include the different cultural resources within each area and are discussed below.

Zone 1 consists of training and testing activities outside the U.S. territorial waters. There are no cultural resources in this zone subject to this Section 106 consultation.

Zone 2 consists of training and testing activities within designated military training ranges and testing locations. No historic properties have been identified in the waters off of Pacific Missile Range Facility (PMRF) including the Shallow Water Training Range. Historic properties are located along the shore of PMRF (outside of the APE) within the sand dunes and include the Barking Sands Dunes, the Nohili Dunes, and Lapa Dunes. In addition, no historic properties have been identified within Kingfisher Training Minefield in the waters off of Niʻihau. Identified submerged historic properties are shown in Enclosure 7 and listed in Enclosure 8, and include

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fishponds, fish traps, pohaku (sacred stones), a sacred cave, landing sites, piers, plane wrecks, shipwrecks, and submerged military craft.

The ranges and training areas on the southern side of O'ahu (Barbers Point Underwater Range, Puuloa Underwater Range, Ewa Training Minefield) have evidence of submerged military craft (plane wrecks and shipwrecks) near the ranges. Under the Sunken Military Craft Act, which was enacted on 28 October 2004, the Navy's submerged military craft remain property of the United States. Although place names are mentioned in traditional mo'olelo (stories), no submerged traditional Hawaiian cultural resources or historic properties have been identified.

Amphibious landings at Kawaihae Harbor will follow previously determined transit routes into the harbor towards the boat ramp. Although archaeological sites comprising the Pu'ukohola Heiau National Historic Site are located on land south of the boat harbor, this location is not part of the APE. An underwater shark heiau (temple) is alleged to be located in the waters off of the National Historic Site. However, no heiau, nor remnants thereof have been located and verified.

Amphibious landings at MCBH are proposed for Hale Koa Beach and Pyramid Rock Beach. Hale Koa Beach was developed on filled land in the 1940s and 1950s from material dredged from Kāne'ohe Bay. No submerged historic properties are located in the waters off of this beach. A flying boat (PBY Catalina), is located in the waters southwest of the beach. It was sunk during the Japanese attack on 7 December 1941 and is eligible for listing on the NRHP. The flying boat is in about 500 m off of the shore in 25 feet of water, well below disturbance from the amphibious vehicles. Amphibious landings are also proposed for Pyramid Rock Beach. The Mōkapu Burial Area (Site 1017) is listed on the NRHP. Its boundary consists of a large rectangle and extends into the water at Pyramid Rock Beach near the amphibious landing route. MCBH has standard operating procedures to avoid affecting the site.

Amphibious landings occur at the beach at MCTAB. Although no evidence of traditional Hawaiian submerged cultural resources have been identified in the waters off MCTAB, a World War II plane wreck was discovered by recreational divers in the 1970s who stripped the plane of many of its artifacts. It is likely the plane is a P-40 that was shot down during the Japanese attack. The plane has lost its integrity and is not eligible for listing on the NRHP.

Portions of FORACS and Surface Ship Radiated Noise Measurement System in the waters off of O'ahu area are on the west side of O'ahu. Evidence of four submerged military craft are located in the waters off the FORACS and Surface Ship Radiated Noise Measurement System area. The activities in this area focus on equipment function and calibration and will not affect the submerged military craft. No traditional Hawaiian submerged historic properties have been identified in this area.

Surface ship and submarine sonar maintenance and testing may occur while docked along the piers in Pearl Harbor. Diver training is also proposed for the waters off Pearl Harbor. Pearl Harbor is listed on the NRHP as a district and includes the USS Bowfin National Historic Landmark (NHL), the USS Arizona NHL, and the USS Utah NHL. The harbor is described as a large landlocked port that contributed to the rise of the United States as a major world power. Pearl Harbor's mission is support of the fleet and includes sheltering, arming, and repairing naval

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vessels and aircraft. The USS Bowfin NHL, the USS Arizona NHL, and the USS Utah NHL will be avoided during training and testing. Maintenance and testing of surface ships within Pearl Harbor is consistent with the mission of Pearl Harbor and therefore no historic properties within the harbor will be affected.

Submarine training activities such as mine detection and exercise torpedo training would occur at the Kahoolawe Sub Training Minefield and the HATS. Mine-shapes (inert training devices that look like mines) are used at the Kahoolawe Sub Training Minefield. These mine-shapes are permanently installed. Since this area is located near Kahoolawe, consultation participants and NHOs inquired about whether the type of training would affect the waters around the island, particularly munitions and explosives of concern in Kealaikahiki channel. The channel is not considered a historic property, and the type of training described above would not affect it.

Zone 3, the non-military area around the main Hawaiian Islands, contains cultural resources, which appear to meet the National Register criteria for historic properties, and are shown in Enclosure 8. This list includes traditional Hawaiian historic properties such as fishponds, fish traps, an underwater cave, and a platform on a sea stack that may be a bird catchers shrine.

Additional submerged cultural resources that appear to meet the National Register criteria for historic properties are shown in Enclosure 8. They include shipwrecks, plane wrecks, and landing craft identified by NOAA's Maritime Heritage Coordinator. In water actions proposed for this area, such as vessel/boat movements and personnel insertion/extraction activities, are activities that do not have a potential to affect these historic properties. Ships and submarines maneuver in deep water and will not be sailing along the near coast region where traditional Hawaiian fishponds and fish traps are located.

Zone 4 is the area within Papahānaumokuākea Marine National Monument and includes the area within the eastern edge of the monument boundaries. The Navy transits to/from the Western Pacific within the eastern edge of the monument boundaries. Submerged historic properties in Papahānaumokuākea Marine National Monument have been identified further northwest of the transit route and include the Two Brother Shipwreck, which is listed on the National Register. Additional shipwrecks and plane wrecks are associated with the Battle of Midway and are part of the National Memorial to the Battle of Midway located northwest of the transit route. Other historic properties include the Necker Island Archaeological District and the Nihoa Island Archaeological District. Both of these districts are listed on the National Register and include sites and features on the island itself. The training and testing activities do not include these islands and thus we do not anticipate an adverse effect to the monument or historic property.

DETERMINATION OF AFFECT

The Navy has determined that the proposed training and testing will result in no historic properties affected in accordance with the NHPA Section 106 Implementing Regulations at 36 CFR 800.4(d)(1). As specified in the HSTT EIS/OEIS, training and testing activities are expected to continue at current or slightly lower levels in existing locations. These or similar activities have been conducted, for some time with no cultural resources being affected throughout the years. Training and testing using artillery and explosives will take place within the open ocean or

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near-shore areas within designated training ranges away from where there are any known historic properties. While historic properties do exist within the APE, such as NHL Pearl Harbor, the proposed activities, will not affect the characteristics that make these historic properties eligible as defined in § 800.16(i). In addition, the remaining training and testing activities within the APE are not the type of activities that affects historic properties and thus the historic properties along the shore such as fishponds will not be affected. In the remote chance that historic properties are discovered or unanticipated effects on historic properties found after completion of the section 106 process, the Navy will make reasonable efforts to avoid, minimize or mitigate adverse effects following 36 CFR 800.13(b).

We request your review and concurrence within 30 days of receipt of this letter. As defined in 36 CFR 800.5(c)(1) we will assume your concurrence if no objection is received from your office within 30 days of receipt of this letter. The Navy is forwarding copies of this letter to consulting parties listed below as part of the Section 106 process for this proposed undertaking [Enclosure 9]. Thus, we request comments from the consulting parties listed below regarding the aforementioned determinations within 30 days of receipt of this letter. Should you or your staff have any questions or concerns, please contact Coral Rasmussen of Naval Facilities Engineering Command Pacific Environmental Planning at (808) 472-1432 or via email at coral.rasmussen@navy.mil.

Sincerely,

L. M. FOSTER
By direction

Enclosures: (1) Detail showing the Northwestern Hawaiian Islands within Papahānaumokuākea National Marine Monument. The Area of Potential Effect is shown as the U.S. territorial sea, which is the belt of coastal waters extending 12 nautical miles from the shoreline.
(2) Activities occurring within 12 nm of shore.
(3) Training and Testing Areas around Kaua'i.
(4) Training and Testing Areas around O'ahu.
(5) Training and testing areas in Kealaikahiki Channel off Maui.
(6) Training and Testing Areas around Hawai'i Island.
(7) Submerged cultural resources compiled from sites listed in the NRHP, in the Hawaii State Historic Preservation Division database, and identified by NOAA in the waters off the Hawaiian Islands.
(8) Historic properties identified within the APE.
(9) List of Consulting Parties for the Section 106 consultations.

Copy to: (via e-mail)
Advisory Council on Historic Preservation: Katherine Kerr
National Park Service, West Regional Office, NHL Program: Elaine Jackson-Retondo

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Winifred Basques, Poʻo, Nanaʻi Kaula (Lanaʻi), Aha Moku Advisory Committee (AMAC), and Hauʻouiwi Homestead Association on Lānaʻi
Kiersten Faulkner, Historic Hawaii Foundation
Hanalei Fergerstrom, Na Kupuna Moku O Keawe
Peleke Flores, Kanaka, Kiaʻi Kanaloa
Bertha Fowler, Native Hawaiian from Texas
Cindy Freitas, Mauna Kea Anaina Hou
Shaylisse Gregory, Protect Kahoolawe ʻOhana
Isaac Harp, The Hawaiian Patriotic League
Maydean Iao and Leiʻohu Ryder, Aloha in Action
Elaine Jackson-Retondo, NPS
Matthew Kahoopii, Native Hawaiian Practitioner
Vernon Kalanikau, Aha Moku
Leslie Kuloloia, Kulooloiʻa Lineage – I ke Kai ʻo Kulooloiʻa
Kēhau Lucas, Protect Kahoolawe ʻOhana
Liko Martin, Native Hawaiian
Kealoha Pisciotta, Kai Palaoa and Mauna Kea Anaina Hou
Marlene Robinson, Kingdom of Hawaii (Maui)
Sy Shim, Konohiki of Hawaii (Kauai)
Able Simeomalui, Kūpuna, Keawe Family, Moku o Keawe
Matthew Souza, UH Disaster Preparedness, NCAR, Indigenous Rising Voices
Shelley Stephens, Native Tenant Protection Council, Mahi-hani
Laulani Teale, Hoʻo Pe Pono Peace Project
Hans Van Tilburg, Maritime Heritage Coordinator, NOAA

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Appendix K: Geographic Mitigation Assessment

Final
Environmental Impact Statement/Overseas Environmental Impact Statement
Hawaii-Southern California Training and Testing

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K. GEOGRAPHIC MITIGATION ASSESSMENT

K.1 INTRODUCTION

The United States (U.S.) Department of the Navy (Navy) has been mitigating impacts from its training and testing activities for more than two decades using a combination of procedural mitigation and geographic mitigation. Current procedural mitigation (which applies throughout the Study Area) and mitigation measures that apply to specific geographic areas are reflected in the December 20, 2013 Record of Decision for the Hawaii-Southern California Training and Testing (HSTT) Final Environmental Impact Statement/Overseas Environmental Impact Statement (EIS/OEIS).

All mitigation measures (procedural and geographic) presented in this EIS/OEIS apply to both Alternative 1 and Alternative 2 and would be implemented as part of the Proposed Action, as discussed in Chapter 2 (Description of the Proposed Action and Alternatives), Section 2.3.4 (Mitigation Measures), and shown in Table 2.3-7. These mitigation measures are considered in the Chapter 3 (Affected Environment and Environmental Consequences) environmental analyses for each relevant biological resource and are discussed in detail in Chapter 5 (Mitigation).

Procedural mitigation measures are tailored to specific training and testing activities and are implemented whenever and wherever those activities take place within the Study Area. The Navy's methods for developing procedural mitigation for each specific activity are detailed in Chapter 5 (Mitigation).

In addition to procedural mitigation, the Navy implements specific mitigation measures in designated geographic locations within the Study Area, referred to as "mitigation areas." This appendix demonstrates the Navy's thorough consideration of specific mitigation areas during the planning process. This appendix contains background information and lays out the methodology used by the Navy in its scientific and operational analysis for assessing and developing proposed mitigation areas within the HSTT Study Area to further avoid or reduce potential impacts on marine mammals in key areas of biological importance.

For the purposes of this assessment, the term "geographic mitigation" means mitigation, beyond the procedures described above, that has been tailored to geographic locations (mitigation areas), designed to benefit particular species and stocks of marine mammals, and which can include provisions to apply measures either year-round or seasonally, depending on the unique characteristics of the area. When committed to, for a particular species, such mitigation measures can also serve to provide indirect benefits to other marine species, such as sea turtles, fish, corals, or other marine mammals. A list of the mitigation areas assessed in this appendix is provided in Table K.1-1 and described in Section K.1.1 (Mitigation Areas Analyzed). Information on the approach to analysis is contained in Section K.2.1 (Approach to Analysis). The mitigation area assessments are presented in Sections K.3 (Biologically Important Areas Within the Hawaii Range Complex Portion of the HSTT Study Area) and K.4 (Biologically Important Areas Within the Southern California Portion of the HSTT Study Area). The assessments for all mitigation areas considered in this appendix are also summarized in Chapter 5 (Mitigation).

All final procedural and geographic mitigation measures are coordinated with the National Marine Fisheries Service (NMFS) and the United States Fish and Wildlife Service, as appropriate, through the consultation and permitting process and will be documented and committed to in the Navy and NMFS Records of Decision, NMFS Marine Mammal Protection Act (MMPA) Final Rule and Letters of Authorization, and the Endangered Species Act (ESA) Biological Opinions.

K.1.1 MITIGATION AREAS ANALYZED

K.1.1.1 Biologically Important Areas

The Navy has assessed areas that were identified in Ferguson et al. (2015b), Baird et al. (2015a); Calambokidis et al. (2015); Van Parijs et al. (2015) as "Biologically Important Areas" within the HSTT Study Area. As discussed in Section 3.7.2.1.2 (Habitat Use), the National Oceanic and Atmospheric Administration's Cetacean Density and Distribution Mapping Working Group identified biologically important areas for 24 cetacean species, stocks, or populations in seven regions within U.S. waters (Figure K.1-1 and Figure K.1-2). These "region-, species, and time-specific" defined areas are biologically important if they meet the following criteria (Ferguson et al., 2015b):

- Reproductive Areas – Areas and times within which a particular species selectively mates, gives birth, or are found with neonates or calves.
- Feeding Areas – Areas and times within which aggregations of a particular species preferentially feed. These either may be persistent in space and time or associated with ephemeral features that are less predictable but are located within a larger area that can be delineated.
- Migratory Corridors – Areas and times within which a substantial portion of a species is known to migrate; the corridor is spatially restricted.
- Small and Resident Population – Areas and times within which small and resident populations occupy a limited geographic extent. (Note: for this category, the Cetacean Density and Distribution Mapping Working Group delineated biologically important areas for "populations or stocks whose range spans only a bay, an area around one or several islands, or a portion of what the Cetacean Density and Distribution Mapping Working Group define as a region. Each regional chapter provides an explicit definition of 'resident' for each small and resident biologically important area delineated").

Biologically important areas as defined in Ferguson et al. (2015b) are not exclusionary zones (closure areas) and are not analogous to marine protected areas or critical habitat under the ESA, but rather were identified as resource management tools to "aid the National Oceanic and Atmospheric Administration and other federal agencies in … analyses and planning as required under multiple U.S. statutes," such as the National Environmental Policy Act (NEPA), MMPA and ESA, "to characterize and minimize the impacts of anthropogenic activities on cetaceans and to achieve conservation and protection goals" (Ferguson et al., 2015b).

Although NMFS considers each area's boundary to be dynamic and subject to change based on new information (Ferguson et al., 2015a), the Navy's assessments in this appendix are based on the areas as they were described by the Cetacean Density and Distribution Mapping Working Group source documents (Van Parijs et al., 2015). As new data become available, Navy and NMFS will continue to reassess the data via the adaptive management process discussed in Chapter 5 (Mitigation), Section 5.1.2.2 (Monitoring, Research, and Reporting Initiatives).

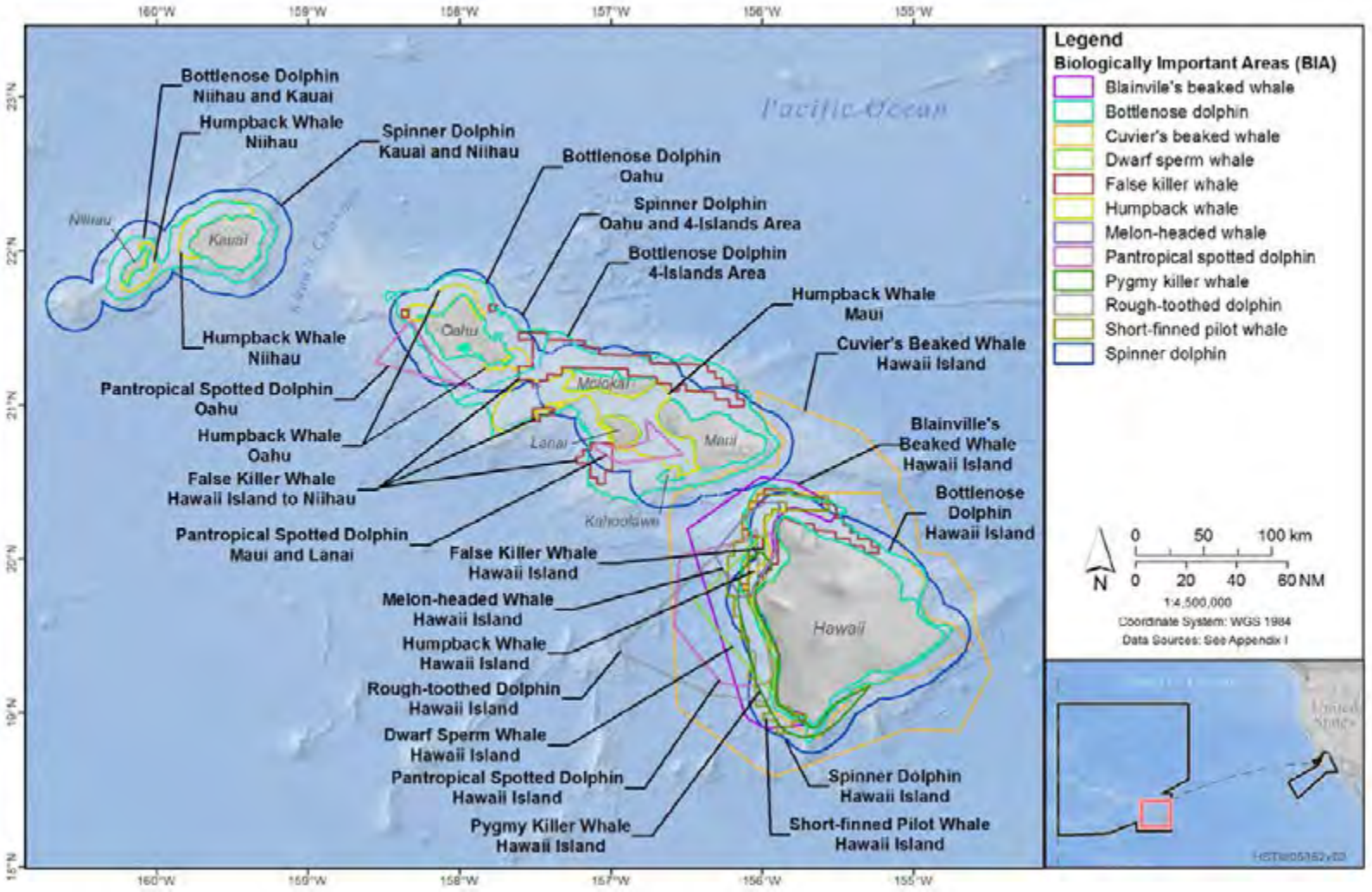


Figure K.1-1: Biologically Important Areas in the Hawaii Portion of the Study Area

Note: Discrete maps of the individual areas are presented in the following subsections where those areas are discussed for each species.

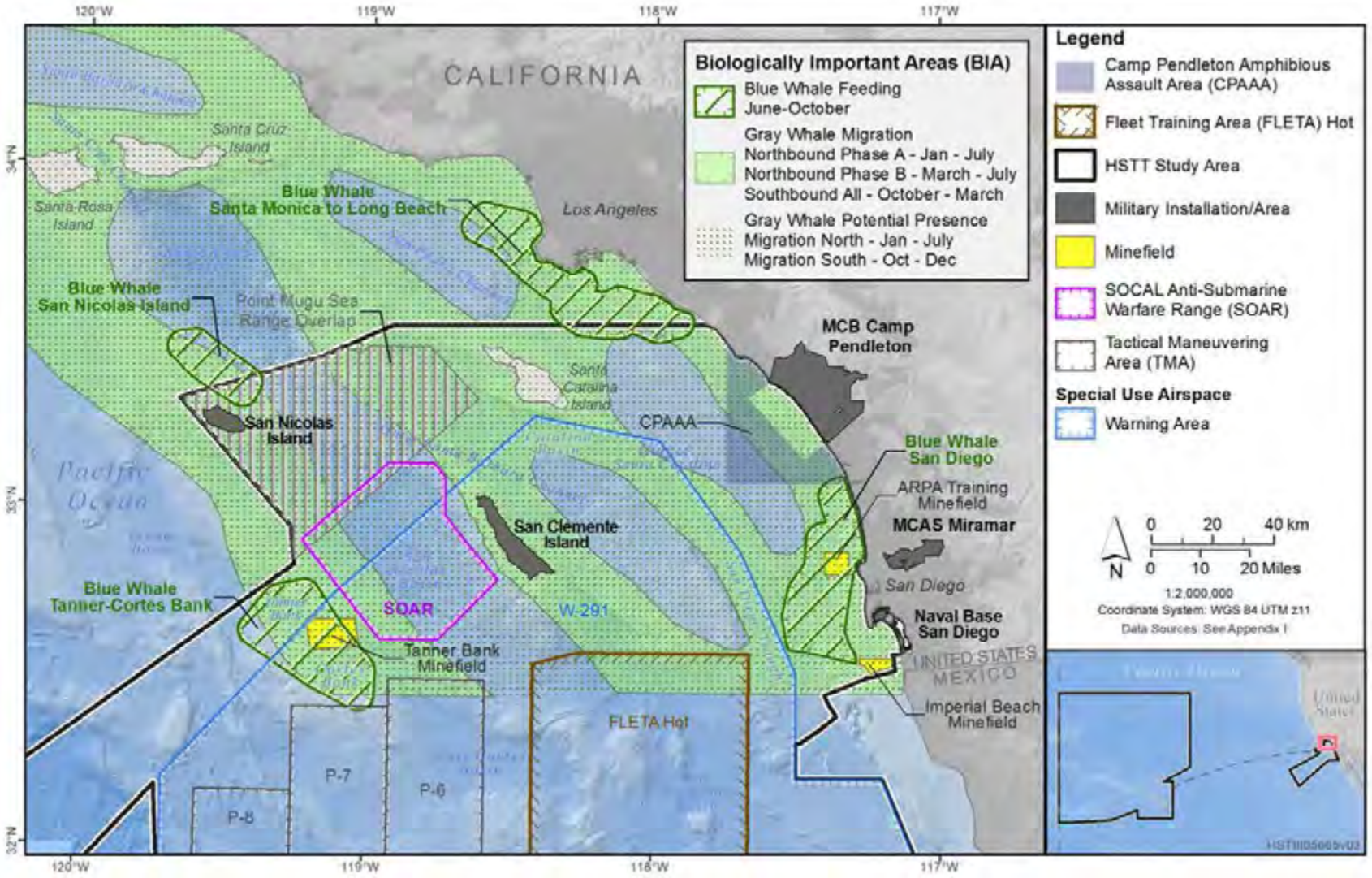


Figure K.1-2: Biologically Important Areas in the Southern California Portion of the Study Area

Notes: MCB = Marine Corps Base; MCAS = Marine Corps Air Station; SOCAL = Southern California

For this assessment, the Navy used the Cetacean Density and Distribution Mapping Working Group source literature (Van Parijs et al., 2015) in combination with Navy marine species monitoring reports, available tagging data, and the most up-to-date scientific literature, to assess the potential likelihood that additional mitigation in these areas would be warranted. In many instances, data from the Navy's marine mammal tagging studies were particularly helpful in providing context about the full extent of habitats used by cetaceans for biologically important behaviors in the Study Area, since oftentimes the biologically important areas identified in Baird et al. (2015a); Calambokidis et al. (2015); Van Parijs et al. (2015) represent only a portion of the habitats used by marine mammals throughout their range.

K.1.1.2 Provisional 2015 Prohibited or Restricted Areas within the HSTT Study Area

Following the publication of the 2013 Hawaii-Southern California Final EIS/OEIS, a 2015 HSTT-related settlement agreement temporarily prohibited or restricted Navy activities within specific areas in the HSTT Study Area. At the time of executing the terms of the settlement agreement in September 2015, the Navy agreed to temporary prohibitions or restrictions on the use of certain hull-mounted active sonars and in-water explosives within defined areas (hereafter referred to as "settlement areas") until the current authorizations under MMPA and ESA expire on December 24, 2018, or the earlier issuance of superseding environmental compliance documents.[1]

The settlement agreement imposed various provisional temporary prohibitions and restrictions on activities within specific portions of the Study Area as depicted in Figure K.1-3 and Figure K.1-4. The settlement measures include combinations of temporal and geographic prohibitions or restrictions on the use of mid-frequency active sonar and in-water explosives during major training exercises and unit level training or testing activities. The settlement also includes several safe speed measures that apply to Navy vessels within defined areas, but those measures do not place a numerical limit on vessel speed. Subject to certain reporting requirements, the Navy may conduct activities otherwise prohibited by the agreement if it deems the activities necessary for national defense.

The temporary settlement measures were derived pursuant to negotiations with plaintiffs and were not evaluated or selected based on the type of thorough examination of best available science that occurs through the consultation process under the MMPA, or through analysis conducted for NEPA purposes. The Navy's adoption of restrictions on its activities as part of a short-term settlement does not mean that those restrictions are necessarily supported by the best available science or practicable to implement for the Navy's military readiness activities in the HSTT Study Area over a longer term.

[1] Conservation Council for Hawaii *et al.* v. National Marine Fisheries Service *et al.* and Natural Resources Defense Council, Inc., *et al* v. National Marine Fisheries Service, *et al.*

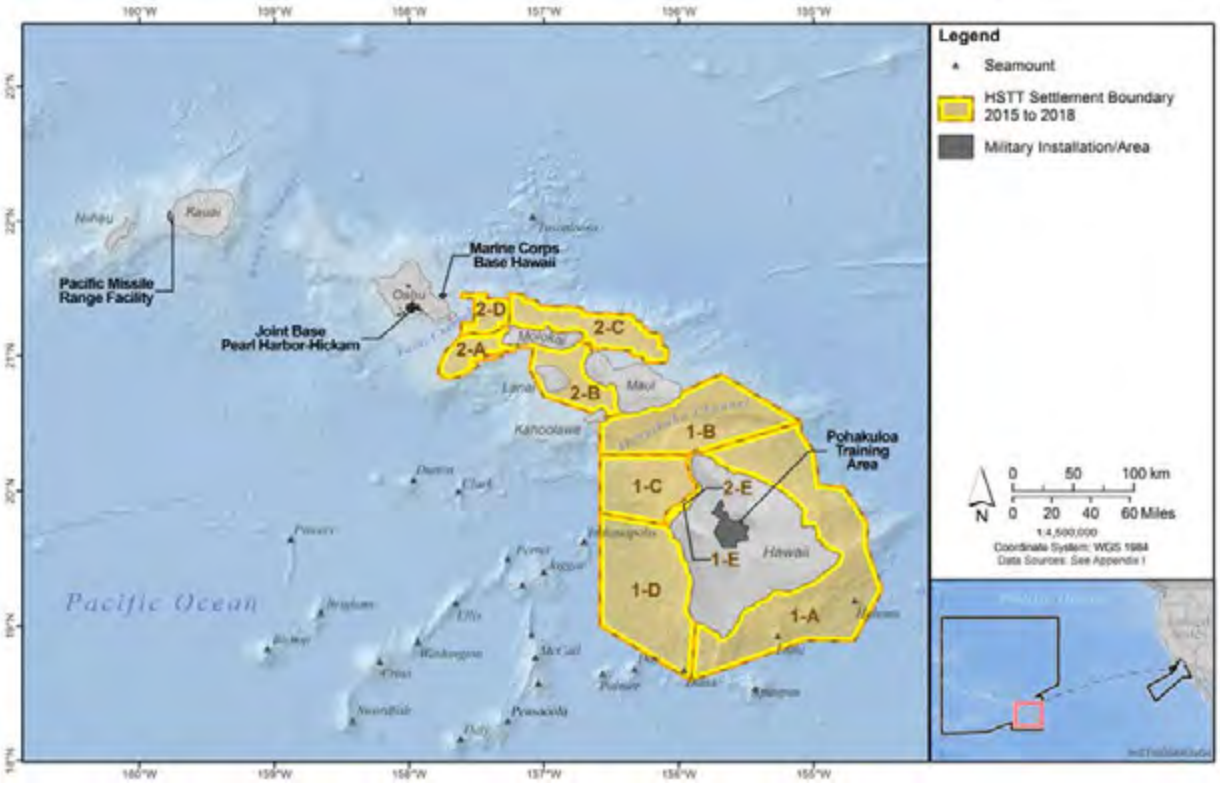


Figure K.1-3: Settlement Areas in the Hawaii Portion of the Study Area

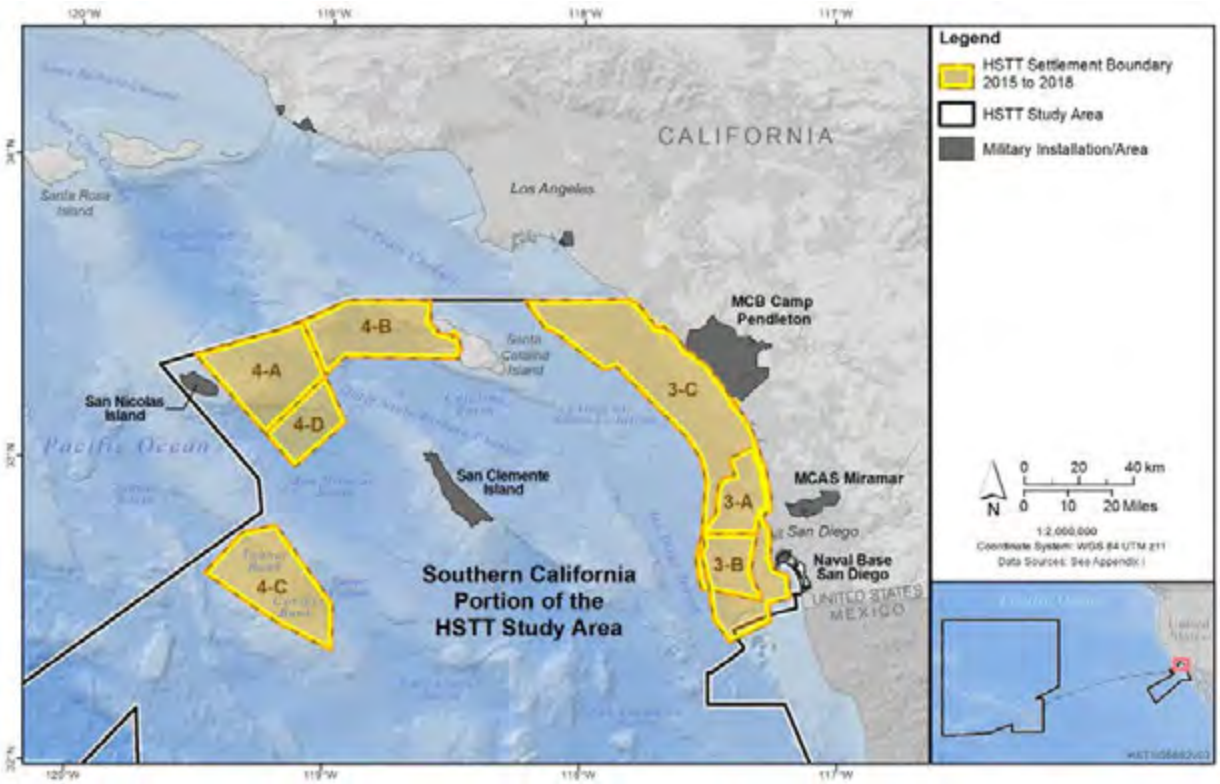


Figure K.1-4: Settlement Areas in the Southern California Portion of the Study Area

The settlement measures have applied to the Navy's ongoing activities since September 2015 and form part of the baseline environmental conditions that exist within the HSTT Study Area. To understand the restrictions and prohibitions on activities reflected in the settlement agreement, it is necessary to review the following set of definitions that apply to the terms at the time of the agreement:

- "In-water explosive" (for the purposes of this settlement agreement) means a weapon containing an explosive-filled warhead or demolition charge purposefully detonated below the water's surface. This definition specifically excludes devices employing explosives with 5 pounds (lb.) net explosive weight or less for non-weapon functions such as launch or ejection, or actuating or performing internal functions.
- "Mid-frequency active sonar" means hull-mounted, mid-frequency active sonar producing signals from 1 to 10 kilohertz [kHz] on Navy surface vessels.
- "Major training exercise" means a coordinated or strike group major training exercise that consists of: Integrated Anti-Submarine Warfare Course, Composite Training Unit Exercise, Joint Task Force Exercise, Sustainment Exercise, Undersea Warfare Exercise, Independent Deployer Certification Exercise, and Rim of the Pacific Exercise. Major training exercises include unit-level training that may be conducted by major training exercise participants when a major training exercise is ongoing.
- "System checks" means the non-tactical use of mid-frequency active sonar for pre-operational testing, preventive or corrective maintenance, and during inspections by the Board of Inspection and Survey.
- "Unit-level training" means single surface vessel training, or a combination of surface vessels and submarines or aircraft training, with the use of surface ship mid-frequency active sonar.

The following are the settlement areas and their associated restrictions or limitations (Figures K.1-3 and K.1-4):

Area 1-A: the Navy agreed to (a) prohibit the use of mid-frequency active sonar for training and testing activities during both major training events and unit-level training; and (b) prohibit the use of in-water explosives for training and testing activities.

Area 1-B: the Navy agreed to limit the use of mid-frequency active sonar for training and testing activities during major training events to one Rim of the Pacific in 2016, one Rim of the Pacific in 2018, three Undersea Warfare Exercises per calendar year, and one Independent Deployer Certification Exercise per calendar year.

Area 1-C: the Navy agreed to (a) limit the use of mid-frequency active sonar for training and testing activities during major training events to one Rim of the Pacific in 2016, one Rim of the Pacific in 2018, three Undersea Warfare Exercises per calendar year, and one Independent Deployer Certification Exercise per calendar year; (b) prohibit the use of mid-frequency active sonar for training and testing activities during unit-level training (excluding unit-level training conducted by participants in an ongoing major training event); and (c) prohibit the use of in-water explosives for training and testing activities.

Area 1-D: the Navy agreed to (a) limit the use of mid-frequency active sonar for training and testing activities during major training events to one Rim of the Pacific in 2016, one Rim of the Pacific in 2018, three Undersea Warfare Exercises per calendar year, one Independent Deployer Certification Exercise per calendar year, and one Sustainment Exercise per calendar year; (b) prohibit the use of mid-frequency active sonar for training and testing activities during unit-level training (excluding unit-level

training conducted by participants in ongoing major training events); and (c) prohibit the use of in-water explosives for training and testing activities.

Area 1-E: the Navy agreed to require that all surface vessels use extreme caution and proceed at safe speed so they can take proper and effective action to avoid a collision with any sighted object or disturbance, and can be stopped within a distance appropriate to the prevailing circumstances and conditions (where Area 1-E overlaps with Areas 1-B and 1-C, the restrictions imposed within Areas 1-B and 1-C, respectively, also apply).

Area 2-A: the Navy agreed to (a) prohibit the use of mid-frequency active sonar for training and testing activities during major training events; (b) prohibit the use of in-water explosives for training and testing activities; and (c) require that all surface vessels use extreme caution and proceed at safe speed so they can take proper and effective action to avoid a collision with any sighted object or disturbance, and can be stopped within a distance appropriate to the prevailing circumstances and conditions.

Area 2-B: the Navy agreed to (a) prohibit the use of in-water explosives for training and testing activities; and (b) require that all surface vessels use extreme caution and proceed at safe speed so they can take proper and effective action to avoid a collision with any sighted object or disturbance, and can be stopped within a distance appropriate to the prevailing circumstances and conditions.

Area 2-C: the Navy agreed to (a) prohibit the use of mid-frequency active sonar for training and testing activities during major training events; (b) implement a Protective Measure Assessment Protocol measure advising Commanding Officers that the area is false killer whale (*Pseudorca crassidens*) habitat and that they should avoid using mid-frequency active sonar during unit-level training within the area whenever practicable; and (c) prohibit the use of in-water explosives for training and testing activities (within the overlap of Area 2-B and Area 2-C, the restrictions imposed in Area 2-B and Area 2-C both apply).

Area 2-D: the Navy agreed to prohibit the use of in-water explosives for training and testing activities.

Area 3-A: the Navy agreed to (a) prohibit the use of mid-frequency active sonar for training and testing activities during major training events and unit-level training from June 1 through October 31; and (b) require that all surface vessels use extreme caution and proceed at safe speed so they can take proper and effective action to avoid a collision with any sighted object or disturbance, and can be stopped within a distance appropriate to the prevailing circumstances and conditions.

Area 3-B: the Navy agreed to (a) prohibit the use of mid-frequency active sonar for training and testing activities during major training events and unit-level training, except for system checks, from June 1 through October 31; (b) implement a seasonal Protective Measure Assessment Protocol measure from June 1 through October 31 advising Commanding Officers that the area is blue whale (*Balaenoptera musculus*) habitat and that they should avoid conducting system checks within the area whenever practicable; and (c) require that all surface vessels use extreme caution and proceed at safe speed so they can take proper and effective action to avoid a collision with any sighted object or disturbance, and can be stopped within a distance appropriate to the prevailing circumstances and conditions.

Area 3-C: the Navy agreed to require, from November 1 through May 20, that all surface vessels use extreme caution and proceed at safe speed so they can take proper and effective action to avoid a collision with any sighted object or disturbance, and can be stopped within a distance appropriate to the prevailing circumstances and conditions.

Area 4-A: the Navy agreed to (a) prohibit the use of mid-frequency active sonar for training and testing activities during major training events and unit-level training; and (b) prohibit the use of in-water explosives for training and testing activities.

Area 4-B: the Navy agreed to prohibit the use of mid-frequency active sonar for training and testing activities during major training events and unit-level training.

Area 4-C: the Navy agreed to require, from June 1 through October 31, that all surface vessels use extreme caution and proceed at safe speed so they can take proper and effective action to avoid a collision with any sighted object or disturbance, and can be stopped within a distance appropriate to the prevailing circumstances and conditions.

Area 4-D: The Navy agreed to require all surface vessels to use extreme caution and proceed at a safe speed so they can take proper and effective action to avoid a collision with any sighted object or disturbance, and can be stopped within a distance appropriate to the prevailing circumstances and conditions.

K.1.1.3 Areas Identified by the California Coastal Commission

On January 14, 2013, the Navy submitted a Consistency Determination to the California Coastal Commission pursuant to the Coastal Zone Management Act. In accordance with an agreement signed April 14, 2016, and in effect until December 25, 2018, Navy agreed, among other things, to temporarily designate three geographic areas as areas of low use for hull-mounted mid-frequency active sonar during major training events and to provide annual notice to the Commission of any usage in these areas. These areas are reflected in Table K.1-1 and Figure K.6-1. The Navy also agreed that, in the event that training in the Southern California portion of the Study Area involves a single underwater detonation greater than 20 lb. net explosive weight between sunset and sunrise, Navy would provide the California Coastal Commission post-event notice within 72 hours of the event. Under the terms of the agreement, Navy has more recently assessed whether geographic limitations are scientifically supported and operationally practicable for these three particular areas. The areas agreed upon between the Navy and the California Coastal Commission for low use of hull-mounted mid-frequency sonar during major training events are:

a. San Diego Arc (an area parallel to the coastline in the HSTT Study Area to just north of Del Mar);

b. Area within the Southern California portion of the Study Area that is within 3 nautical miles (NM) around each island of the Channel Islands National Marine Sanctuary (includes only Santa Barbara Island); and

c. Area within 3 NM (San Diego Shore Area) from the mainland California shoreline between Del Mar northward to the northern boundary of the Southern California portion HSTT Study Area (this area also runs parallel to the coastline north of the San Diego Arc).

On March 12, 2018, the Navy submitted a Consistency Determination to the California Coastal Commission for military readiness activities within the Southern California portion of the HSTT Study Area as proposed in the 2017 Draft HSTT EIS/OEIS. In response to the Navy's Consistency Determination, a May 23, 2018 staff report to the California Coastal Commision recommended that the Commission conditionally concur with the Navy's determination of consistency with Section 30230 if the Navy were to implement additional geographic limitations on activities conducted offshore of Southern California (in addition to reccommendations for additional or modifications to procedural mitigations), including the following:

Navy will avoid exposing the following areas to high intensity active sonar and in-water explosives. 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). For in-water explosives, avoidance means prohibiting all "in-water explosives" for (a) and (b) below, and prohibit explosives categories Bins E-6 thru E-13 for (c) thru (f) below:

a. the Channel Island National Marine Sanctuary (including around Santa Barbara Island);

b. state and federal Marine Protected Areas;

c. San Nicolas Basin fin whale and beaked whale high concentration area;

d. 1 km from shore (to protect coastal bottlenose dolphins);

e. seasonally (June 1–Oct. 31), all four blue whale areas sites designated as Biologically Important Areas;

f. vessels speed restrictions in the above listed areas; and

g. any future NMFS-designated biologically important area.

The Navy appeared before the Commission on June 6, 2018 where the Commission voted to object to the Navy's Consistency Determination. In a letter to the Commission dated July 19, 2018, while the Navy disagreed with the conditions recommended by the staff, the Navy did agree to work with the Commison to resolve their differences. The Navy again appeared before the Commission on September 12, 2018 as a continuation of the dialogue regarding the Navy's Consistency Determination.

The Navy's assessment of the above proposed geographic area measures are discusssed in Section K.2.2 (Mitigation Areas to be Implemented), K.2.2.4 (Mitigation Considered and not Carried Forward) of this appendix, or in species specific assessments, as well as Section K.6 (Areas Identified by the California Coastal Commission). Since some of the Commission's recommended conditions are similar in nature or overlap geographically with other recommendations made by other parties, they are incorporated with other discussions where relevant.

K.1.1.4 Areas Suggested During the Public Involvement Process

In addition to the biologically important areas identified in Baird et al. (2015a); Calambokidis et al. (2015); Van Parijs et al. (2015), the HSTT settlement areas, and the California Coastal Commission areas described above, the Navy received comments during the scoping and draft document public involvement processes for the HSTT EIS/OEIS suggesting that the Navy consider additional areas for "time-area management." These areas are listed in Table K.1-1 and are assessed in this appendix.

Public commenters recommended the areas as biologically important, although they were not included in the current list of Cetacean Density and Distribution Mapping biologically important areas identified in Baird et al. (2015a); Calambokidis et al. (2015); Van Parijs et al. (2015). The recommended areas during the scoping and Draft EIS/OEIS comment period include the following locations in the HSTT Study Area and are analyzed within this appendix:

- Cross Seamount, located south of Oahu and southwest of the island of Hawaii (18° 10 N. latitude and 158° W. longitude). The scoping comment suggested that this area has rich pelagic biodiversity, high productivity, and provides foraging habitat for beaked whales. The recommendation also suggested that the Navy consider other nearby seamounts within the Hawaii Range Complex for habitat-based management measures given that they are considered productive long-line fishing grounds for top predators (see Section K.7.1.2, Cross Seamount).

- San Nicolas Basin, located in the Southern California portion of the HSTT Study Area. The San Nicolas Basin was recommended based on satellite telemetry data, photo-identification, and mark-recapture data indicating that it represents an area of high site fidelity for a small population of Cuvier's beaked whales (*Ziphius cavirostris*) (see Section K.7.2.1, San Nicloas Basin and Areas North).
- Santa Catalina Basin, also located in the Southern California portion of the HSTT Study Area. Based on telemetry data, the Santa Catalina Basin also is associated with a high degree of site fidelity for Cuvier's beaked whales (see Section K.7.2.3, Catalina Basin).
- Southernmost edge of California Current, west of Tanner and Cortes Banks (collectively referred to hereafter as Tanner-Cortes Bank), in the Southern California portion of the HSTT Study Area. Acoustic data from long-term acoustic hydrophone recordings suggests this area as biologically important habitat for beaked whales, primarily Cuvier's beaked whales (see Section K.7.2.4, Southernmost Edge of California Current, West of Tanner-Cortes Bank).
- Northern Catalina Basin and San Clemente Basin, both located in the Southern California portion of the HSTT Study Area. Based on long-term acoustic data, these basins were identified as biologically important habitat for Perrin's beaked whale (*Mesoplodon perrini*) (see Section K.7.2.7, Northern Catalina Basin and the San Clemente Basin).
- Between the 200 m and 1,000 m isobath off the mainland shelf within the Southern California portion of the HSTT Study Area for time-area management between November and February to reduce ship-strike risk to fin whales (*Balaenoptera physalus*) due to their increased vulnerability during shallow foraging (see Section K.7.2.8, Waters Just off the Mainland Shelf, Between 200 m and 1,000 m Isobath).

K.1.1.4.1 Additional Mitigation Measures Suggested during the Draft EIS Public Involvement Process

In addition to the areas suggested for "time-area management" as discussed above in Section K.1.1.4 (Areas Suggested During the Public Involvement Process), the Navy received comments during the HSTT Draft EIS/OEIS public involvement process suggesting the Navy implement additional mitigation measures that limit or restrict activities within mitigation areas that the Navy has proposed for implementation.

The Navy has taken into account these public comments received on the HSTT Draft EIS/OEIS, as well as best available science and the feasibility of implementing additional mitigation measures to further reduce impacts on marine mammals. Many of the mitigations since the publication of the Draft EIS/OEIS have been enhanced. The revisions to the mitigation areas are presented in Section K.2.2 (Mitigation Areas to be Implemented). The following is a list of mitigation measures suggested during the public involvement process based on the mitigation areas proposed in the Draft EIS/OEIS:

<u>Southern California portion of the HSTT Study Area:</u>

San Diego Arc Planning Awareness Area

1. Extend the seasonality of the San Diego Arc Planning Awareness Area to June 1–December 31
2. Limit all MFAS within the San Diego Arc Planning Awareness Area

San Diego Arc Cautionary Area

3. Extend the seasonality of the San Diego Arc Cautionary Area to June 1–December 31
4. Prohibit use of air-deployed mid-frequency active sonar
5. Restrict other sources of mid-frequency active sonar
6. Prohibit use of low-frequency active sonar
7. Require vessel speed restrictions within the San Diego Arc Cautionary Area

Channel Islands Sanctuary Cautionary Area

1. Prohibit use of air-deployed mid-frequency active sonar.
2. Prohibit other sources of mid-frequency active sonar
3. Prohibit use of low-frequency active sonar
4. Implement vessel speed restrictions in the Channel Islands Sanctuary Cautionary Area

Additional Recommendations: Habitat Areas of Importance in Southern California as management areas or refuge

1. Important beaked whale habitat in Southern California
    a. San Nicholas Basin
    b. Santa Catalina Basin
    c. Southernmost edge of California Current, west of Tanner and Cortez Banks
    d. Northern Catalina Basin and San Clemente Basin
2. Important fin whale habitat off Southern California
3. Identification of additional important habitat areas in Southern California

<u>Hawaii Range Complex portion of the HSTT Study Area:</u>

West-Side Hawaii Island Planning Awareness Area

1. Expand the West-Side Hawaii Island Planning Awareness Area westward to protect resident Cuvier's beaked whales and rough-toothed dolphins
2. Limit major training exercises to reduce cumulative exposure

West-Side Hawaii Island Cautionary Area

1. Prohibit use of air-deployed mid-frequency active sonar
2. Prohibit other sources of mid-frequency active sonar

East-Side Hawaii Island Cautionary Area

1. Prohibit use of air-deployed mid-frequency active sonar
2. Prohibit other sources of mid-frequency active sonar

Humpback Whale Cautionary Area

1. Extend the Humpback Whale Cautionary Area west to encompass the Humpback Whale Special Reporting Area in Kaiwi Channel

2. Extend restrictions to year-round in the Navy-proposed extended portion of the Humpback Whale Cautionary Area and the public-proposed extension into the Kaiwi Channel Humpback Whale Special Reporting Area.
3. Implement vessel speed restrictions within the Humpback Whale Cautionary Area.
4. Prohibit use of air-deployed mid-frequency active sonar
5. Prohibit use of low-frequency active sonar

Alenuihaha Channel

1. Continue to implement the mitigation measures set forth in the Settlement Agreement for the Alenuihaha Channel and prohibit or restrict the use of air-deployed mid-frequency active sonar and all other sources of mid-frequency active sonar, used in major training exercises and by navy units (e.g., in unit-level training and in maintenance and system checks while in transit) in this area

Northeast Kaiwi Channel

1. Implement the mitigation measures set forth by the Settlement Agreement for the Northeast Kaiwi Channel; and,
2. Prohibit or restrict the use of surface-ship hull-mounted mid-frequency active sonar, air-deployed mid-frequency active sonar, and all other sources of mid-frequency active sonar (i.e., not hull-mounted or helicopter-deployed)

Additional Recommendations: Habitat Areas of Importance in Hawaii as management areas or mitigation areas

1. Cross Seamount
2. Habitat areas off Oahu, Kauai, and Niihau
3. Critical habitat of Main Hawaiian Islands insular false killer whales
4. Identification of additional important habitat areas in Hawaii
5. Standoff distances around mitigation areas
6. Establish stand-off distances around Mitigation Areas to the greatest extent practicable, allowing for variability in size given the location of the area, the type of operation at issue, and the species of concern

K.1.1.5 Mitigation Areas Currently Implemented

Since 2009, the Navy has implemented seasonal mitigation within certain established areas of the Hawaii Range Complex for specific activities. One of these areas was identified as an area with high humpback whale density from December 15 to April 15. This seasonal mitigation area was developed in coordination with NMFS through previous consultation as a means to further reduce the potential for impacts on the humpback whale during calving season and is designated as the Humpback Whale Cautionary Area (Figure K.1-5).

Current Humpback Whale Cautionary Area:

- The Navy will not use hull-mounted mid-frequency active sonar in the mitigation area between December 15 and April 15.

- Should national security present a requirement for hull-mounted mid-frequency active sonar training or testing in the Humpback Whale Cautionary Area, the Navy will require approval from Commander, U.S. Pacific Fleet. The Commander, U.S. Pacific Fleet will base such authorization on the unique characteristics of the area from a military readiness perspective, taking into account the importance of the area for humpback whales and the need to avoid adverse impacts from hull-mounted mid-frequency active sonar to the maximum extent practicable. Further, the Commander, U.S. Pacific Fleet will provide specific direction to operational units on required mitigation prior to conducting training or testing in the Humpback Whale Cautionary Area.
- The Navy will continue to provide NMFS with advance notice if training or testing is to occur in the mitigation area, and will provide data on the training and testing activities conducted after the completion of the events.
- On an annual basis, the Navy will provide a report of the total estimated hours (from December 15 through April 15) of hull-mounted mid-frequency active sonar used in the Humpback Whale Cautionary Area.
- The Navy will continue implementing the Humpback Whale Cautionary Area measures. However, the Navy is proposing changes in the size, season and approval requirements for the mitigation area. See Section 5.4 (Mitigation Areas to be Implemented) for more details on the proposed changes to this cautionary area.

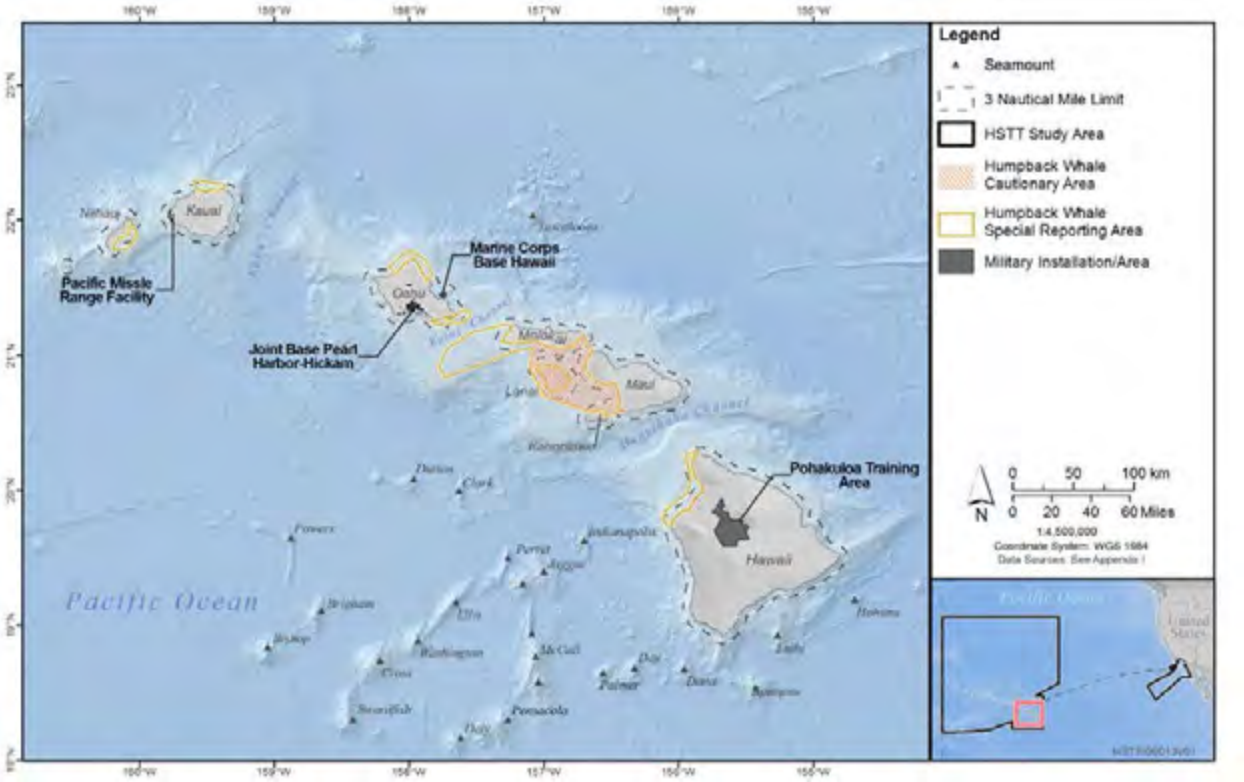


Figure K.1-5: Current Humpback Whale Cautionary Area and Humpback Whale Special Reporting Area

The Humpback Whale Special Reporting Area is comprised of additional areas of high humpback whale densities that overlap the Humpback Whale National Marine Sanctuary. This reporting is included in the

exercise and monitoring reports that are an ongoing Navy requirement and are submitted to NMFS annually. Special reporting data, along with all other reporting requirements, are considered during adaptive management to determine if additional mitigation may be required. The Navy currently reports to NMFS the total hours (from December 15 through April 15) of all hull-mounted mid-frequency active sonar usage occurring in the Humpback Whale Special Reporting Area, plus a 5 km buffer, but not including the Pacific Missile Range Facility. The Navy will continue this reporting for the Humpback Whale Special Reporting Area.

Table K.1-1: Areas Considered for Geographic Mitigation Within the HSTT Study Area

Species	Biologically Important Area	Overlapping Other Area(s)	Mitigation Area Seasonality
Hawaii			
Humpback whales (*Megaptera novaeangliae*)	Reproduction Area: Northwest Kauai	None	December–April
	Reproduction Area: East Niihau	None	
	Reproduction Area: North Oahu	None	
	Reproduction Area: Southeast Oahu	Settlement Areas 2-A and 2-D	
	Reproduction Area: 4- Islands Region and Penguin Bank	Settlement Areas 2-A and 2-B	
	Reproduction Area: Northwest Hawaii Island	Settlement Areas 1-B, 1-C, and 1-D	
	NA	Humpback Whale Cautionary Area	
		Humpback Whale Special Reporting Areas	
Dwarf sperm whales (*Kogia sima*)	Small and Resident Population Area: Hawaii Island	Settlement Areas 1-C, 1-D, 1-E, and 2-E	Year-round
False killer whales (*Pseudorca crassidens*)	Small and Resident Population Area: Main Hawaiian Islands Insular Stock	Settlement Areas 1-A through 1-E, 2-E, and 2-A through 2-D	Year-round
Pygmy killer whales (*Feresa attenuata*)	Small and Resident Population Area: Hawaii Island	Settlement Areas 1-A, 1-C, 1-D, 1-E, and 2-E	Year-round
Short-finned pilot whales (*Globicephala macrorhynchus*)	Small and Resident Population Area: Hawaii Island	Settlement Areas 1-A through 1-D	Year-round

Table K.1 1: Areas Considered for Geographic Mitigation Within the HSTT Study Area (continued)

Species	Biologically Important Area	Overlapping Other Area(s)	Mitigation Area Seasonality
Common bottlenose dolphins (*Tursiops truncatus*)	Small and Resident Population Area: Kauai and Niihau	None	Year-round
	Small and Resident Population Area: Hawaii Island	Settlement Areas 1-A through 1-E, and 2-E	
	Small and Resident Population Area: Oahu	Settlement Area 2-D	
	Small and Resident Population Area: 4-Islands Region	Settlement Areas 2-A through 2-C	
Pantropical spotted dolphins (*Stenella attenuata*)	Small and Resident Population Area: Hawaii Island	Settlement Areas 1-C through 1-E and 2-E	Year-round
	Small and Resident Population Area: 4-Islands Region	Settlement Area 2-B	
	Small and Resident Population Area: Oahu	None	
Spinner dolphins (*Stenella longirostris*)	Small and Resident Population Area: Kure and Midway Atolls	None	Year-round
	Small and Resident Population Area: Pearl and Hermes Reef	None	
	Small and Resident Population Area: Kauai and Niihau	None	
	Small and Resident Population Area: Oahu and 4-Islands Region	Settlement Areas 1-B; 2-A through 2-D	
	Small and Resident Population Area: Hawaii Island	Settlement Areas 1-A through 1-E, and 2-E	
Rough-toothed dolphins (*Steno bredanensis*)	Small and Resident Population Area: Hawaii Island	Settlement Area 1-C through 1-E	Year-round
Cuvier's beaked whales (*Ziphius cavirostris*)	Small and Resident Population Area: Hawaii Island	Settlement Areas 1-A through 1-D	Year-round
Blainville's beaked whales (*Mesoplodon densirostris*)	Small and Resident Population Area: Hawaii Island	Settlement Areas 1-A through 1-E, and 2-E	Year-round
Multiple species	N/A	Cross Seamount and nearby seamounts within the Main Hawaiian Islands Exclusive Economic Zone	Year-round

Table K.1-1: Areas Considered for Geographic Mitigation Within the HSTT Study Area (continued)

Species	Biologically Important Area	Overlapping Other Area(s)	Mitigation Area Seasonality
Southern California			
Blue whales (*Balaenoptera musculus*)	Feeding Area: Santa Monica Bay to Long Beach	Settlement Area 3-C	June–October
		California Coastal Commission (CCC) 3 nautical mile (NM) Area	
	Feeding Area: San Nicolas Island	Settlement Area 4-A; CCC	June–October
	Feeding Area: Tanner-Cortes Bank	Settlement Area 4-C	
	Feeding Area: San Diego Arc	Settlement Areas 3-A through 3-C	
		CCC 3 NM area, and San Diego Arc	
Gray whales (*Eschrichtius robustus*)	Migration Area: Southern California Bight	Settlement Areas 3-A through 3-C and 4-A through 4-D	October–July (approximately)
		CCC 3 NM Area, Channel Island Area, and San Diego Arc	
		Channel Islands National Marine Sanctuary	
Cuvier's beaked whales (*Ziphius cavirostris*)	N/A (refer to Sections K.1.1.4, Areas Suggested During the Public Involvement Process and K.1.1.3, Areas Identified by the California Coastal Commission)	San Nicolas Basin	Year-round
		Tanner Canyon	
		Santa Cruz Basin	
		Santa Catalina Basin	
		Southernmost edge of California Current, west of Tanner-Cortes Bank (approx. lat/long of Site E 32.75N, 119.46W)	Between November and June
		San Clemente Basin (approx. lat/long 32.52N, 118.32W. based on location of HARP [Bauman-Pickering et al. 2015])	Year-round

Table K.1-1: Areas Considered for Geographic Mitigation Within the HSTT Study Area (continued)

Species	Biologically Important Area	Overlapping Other Area(s)	Mitigation Area Seasonality
Perrin's beaked whales (*Mesoplodon perrini*)	N/A (refer to Section K.1.1.4, Areas Suggested During the Public Involvement Process)	Northern Catalina Basin and waters southeast of Santa Catalina Island (approx. lat/long 33.28N, 118.25W based on location of HARP [Bauman-Pickering et al. 2015])	Year-round
Fin whales (*Balaenoptera physalus*)	N/A (refer to Sections K.1.1.4, Areas Suggested During the Public Involvement Process, and K.1.1.3, Areas Identified by the California Coastal Commission)	Fin whales off Southern California between 200 M and 100 M isobaths	November– February
Coastal Bottlenose Dolphins (*Tursiops truncates*)	N/A (refer to Section K.1.1.3, Areas Identified by the California Coastal Commission)	1 km from shore	Year-round
Multiple species	N/A (refer to Section K.1.1.3, Areas Identified by the California Coastal Commission)	State and federal Marine Protected Areas (MPAs) – • MPAs around Catalina Island • MPA around Santa Barbara Island • MPAs along northern mainland coast – off Orange County • MPAs off northern San Diego County area MPA off SSTC	Year-round

K.2 MITIGATION AREA ASSESSMENT

K.2.1 APPROACH TO ANALYSIS

In developing mitigation areas, the Navy considered the manner and degree to which a potential mitigation measure was likely to reduce impacts on species and stocks, while still being practical and safe to implement, and not impeding the effectiveness of military readiness activity. The Navy used a qualitative assessment process when considering potential geographic mitigation areas based on the best available science, the analyses from Chapter 3 (Affected Environment and Environmental Consequences), available tagging data, Navy marine species monitoring data, and input from the training and testing community.

Potential mitigation options within specific geographic areas include reducing or modifying activities in order to reduce impacts on marine species or stocks and their habitat. For example, mitigation could include: limiting the total amount of activity in an area, limiting activities such that a certain number of sonar hours would not be exceeded, using an area less often or for a shorter duration, complete restriction of certain activities or the use of certain systems that result in a stressor, limiting the time of year that an activity is conducted, limiting certain activities to daylight hours only, limiting or restricting major training exercises in certain areas, implementing special reporting requirements, or requiring approval from a designated Command authority for conducting activities in certain areas or during certain times of year. The Navy's mitigation objectives in this assessment are to:

- Ensure that the Proposed Action has only a negligible impact on marine mammal species, stocks, and populations;
- Identify means of effecting the least practicable adverse impact upon the affected marine mammal species or stocks and their habitat (as required by Section 101(a)(5)(A) of the MMPA);
- Ensure that the Proposed Action does not jeopardize the continued existence of endangered or threatened species, or result in destruction or adverse modification of critical habitat (as required under ESA); and
- Avoid or reduce the level of impact of incidental take to individuals and their habitat to the extent reasonable and prudent.

K.2.1.1 Stressors Considered for Analysis

The environmental analyses in Section 3.7 (Marine Mammals) indicate that only certain stressors have the potential to adversely affect marine mammals in the Study Area in a manner that rises to the level of incidental take under MMPA and ESA. The Navy considered, when combined with the procedural mitigation measures that the Navy already implements, if implementing additional geographic mitigation would likely avoid or reduce impacts to marine mammals for the following stressors:

- Acoustic: Sonar and other transducers, airguns
- Explosives: In-water (applies only to those activities for which the Navy seeks MMPA authorization)
- Physical disturbance and strike: Vessel strike

Active sonar and other transducers have the potential to result in incidental takes of marine mammals by behavioral harassment, temporary hearing loss or permanent hearing loss. Explosives may result in

takes by behavioral harassment, temporary hearing loss, permanent hearing loss or other injury, or mortality.

The Navy's modeling of acoustic effects for testing activities using air guns predicted exposures to only one blue whale and one gray whale annually in the Southern California portion of the HSTT Study Area. Therefore, air guns were not analyzed for other species or locations as listed in Table K.1-1.

Vessel strikes from commercial, recreational, and naval vessels are known to have resulted in serious injury and occasional fatalities to large whales (Abramson et al., 2011; Berman-Kowalewski et al., 2010; Bradford & Lyman, 2015; Calambokidis, 2012; Laggner, 2009; Laist et al., 2001; Lammers et al., 2003) (Carretta et al., 2016a) (Jensen & Silber, 2004). There is, however, no evidence that small cetaceans or pinnipeds present in the HSTT Study Area are at risk of Navy vessel strikes. In Appendix F (Military Expended Material and Direct Strike Impact Analyses), the Navy has prepared an analysis of the potential for a Navy vessel to strike a marine mammal in the HSTT Study Area to inform this appendix and the EIS/OEIS.

The remaining stressors as analyzed in Section 3.7 (Marine Mammals), and consistent with the current MMPA authorizations effective through 23 December 2018 and the 2015 ESA section 7 Biological Opinion, would not result in incidental take under the MMPA and are not likely to adversely affect ESA-listed marine mammals. Modeling of acoustic effects from pile driving training activities at Camp Pendleton and the Silver Strand Training Complex in the Southern California portion of the HSTT Study Area does not predict any effects to blue whales or gray whales. Given these are the only two species with identified biologically important areas in the vicinity of the proposed training locations, pile driving will not be analyzed as a stressor in this appendix. The following stressors were dismissed from further consideration for evaluating geographic mitigation:

- Acoustic: weapons noise, pile driving, vessel noise, aircraft noise
- Energy: in-air electromagnetic devices, in-water electromagnetic devices, lasers
- Physical disturbance and strike: in-water devices, aircraft and aerial targets, military expended materials, seafloor devices
- Entanglement: wires and cables, decelerators and parachutes, biodegradable polymer
- Ingestion: military expended materials–munitions, military expended materials other than munitions
- Secondary: Impacts on Habitat, Impacts on Prey Availability

K.2.1.2 Biological Effectiveness Assessment

The first step of the mitigation area assessment was a biological effectiveness assessment (presented in the Biological Considerations sections) of each area identified in Section K.1.1 (Mitigation Areas Analyzed). This assessment considered if implementing geographic mitigation in these areas, in addition to procedural mitigation measures which are implemented throughout the Study Area, would be effective at reducing adverse impact on marine mammal species or stocks and their habitat. Assessments of overlapping areas were combined whenever possible. The Navy considered a specific mitigation area to be biologically effective if it met the following criteria:

1. The best available science suggests that the area is of biological importance to one or more species or resources for a biologically important life process (e.g., foraging, migration, or reproduction) or ecological function, year-round or for part of the year.

2. Implementing the mitigation would likely result in avoiding or minimizing injury or mortality; limiting interruption of known feeding, breeding, mother/young, or resting behaviors; minimizing the abandonment of important habitat (temporally and spatially); minimizing the number of individuals subjected to these types of disruptions; and limiting degradation of habitat.
3. Implementing the mitigation would not shift or transfer adverse effects from one species to another, or to a more vulnerable or sensitive species.

K.2.1.3 Operational Assessment

A second step, an operational assessment (presented in the Navy Requirements for Area-Specific Training and Testing sections), considered what activities are conducted in specific geographic areas and assessed the importance of those areas for those specific activities. The Navy assessed how and to what degree a specific mitigation measure would be compatible with planning, scheduling, and conducting training and testing activities under the Proposed Action in order to meet the Navy's Title 10 mission. In its operational assessment, the Navy considered such things as cost, impact on operations, personnel safety, practicality of implementation, and impact on the effectiveness of the military readiness activity in accordance with 16 U.S.C. 1371(a)(5)(A)(ii). This part of the assessment also considered information from annual training exercise reports, testing event reports, monitoring reports, and feedback from members of the training and testing community who are responsible for implementing the mitigation.

It is vital that the Navy effectively executes readiness activities to ensure naval forces can effectively execute military operations. The ability to schedule and locate training and testing without excessively burdensome restrictions within the Study Area is crucial to ensure those activities are practical, effective, and safe to execute. To meet its military readiness requirements, the Navy requires consistent access to a variety of realistic, tactically-relevant oceanographic and environmental conditions (e.g., bathymetry, topography, surface fronts, and variations in sea surface temperature), and sea space and airspace that is large enough or situated in a way that allows activities to be completed without physical or logistical obstructions, in order to achieve the highest skill proficiency and most accurate testing results possible in areas analogous to where the military operates. Some of the elements considered in selecting training and testing locations include:

- Proximity to training ranges, testing facilities, air squadrons, home ports, and existing infrastructure (e.g., instrumented underwater and land ranges);
- Availability of aircraft emergency landing fields;
- Access to a variety of realistic or unique tactical environments required to ensure training and testing effectiveness and meet testing program requirements;
- Ability to de-conflict participants (e.g., ships, aircraft, or submarines) or other users of the water and air space (e.g., commercial shipping, recreational boating, fishing, and commercial air traffic routes) during Navy activities to ensure the various training and testing events do not encroach on each other or other users.

The Navy considered mitigation to be practical to implement if it met all criteria listed below (see Section 5.2.3, Practicality of Implementation, for more details):

- Implementing mitigation is safe: The mitigation must not increase safety risks to Navy personnel and equipment or the general public.

- Implementing mitigation is sustainable: The mitigation would not result in excessive time away from homeport for Navy personnel or an impracticable increase in resource requirements, such as wear and tear on equipment, additional fuel, additional personnel, additional funding, or undue shifting of time spent on operational obligations to other tasks (e.g., increased reporting requirements that take disproportionate time away from focusing on mission requirements).
- Implementing the mitigation allows the Navy to continue meeting its Title 10 obligations: When assessing whether implementing mitigation would allow the Navy to continue meeting its Title 10 obligations, the Navy considered if each individual measure would impact the effectiveness of the military readiness activity.

K.2.2 Mitigation Areas to be Implemented

Based on the extensive review and analysis that is presented in the following sections of this appendix (see Sections K.3–K.7), the Navy proposes to implement the mitigation areas summarized in Table K.2-1 and depicted in Figures K.2-1 through K.2-9. The Navy has taken into account public comments received on the Draft HSTT EIS/OEIS, recommendations from the California Coastal Commission, and best available science since the publication of the Draft EIS/OEIS. The Navy has revised their proposed mitigation areas since the publication of the Draft EIS/OEIS and has determined that implementing mitigation within the mitigation areas discussed below would, in combination with procedural mitigation, effect the least practicable adverse impact on marine mammal species or stocks and their habitat. The proposed mitigation areas were developed because they met the biological effectiveness criteria when balanced against the operational practicality criteria noted above in Sections K.2.1.2 (Biological Effectiveness Assessment) and K.2.1.3 (Operational Assessment). Table K.2-2 provides a comparison of the proposed mitigations to those temporarily implemented through 2018 based on the provisional 2015 settlement agreements with the plaintiffs and the California Coastal Commission.

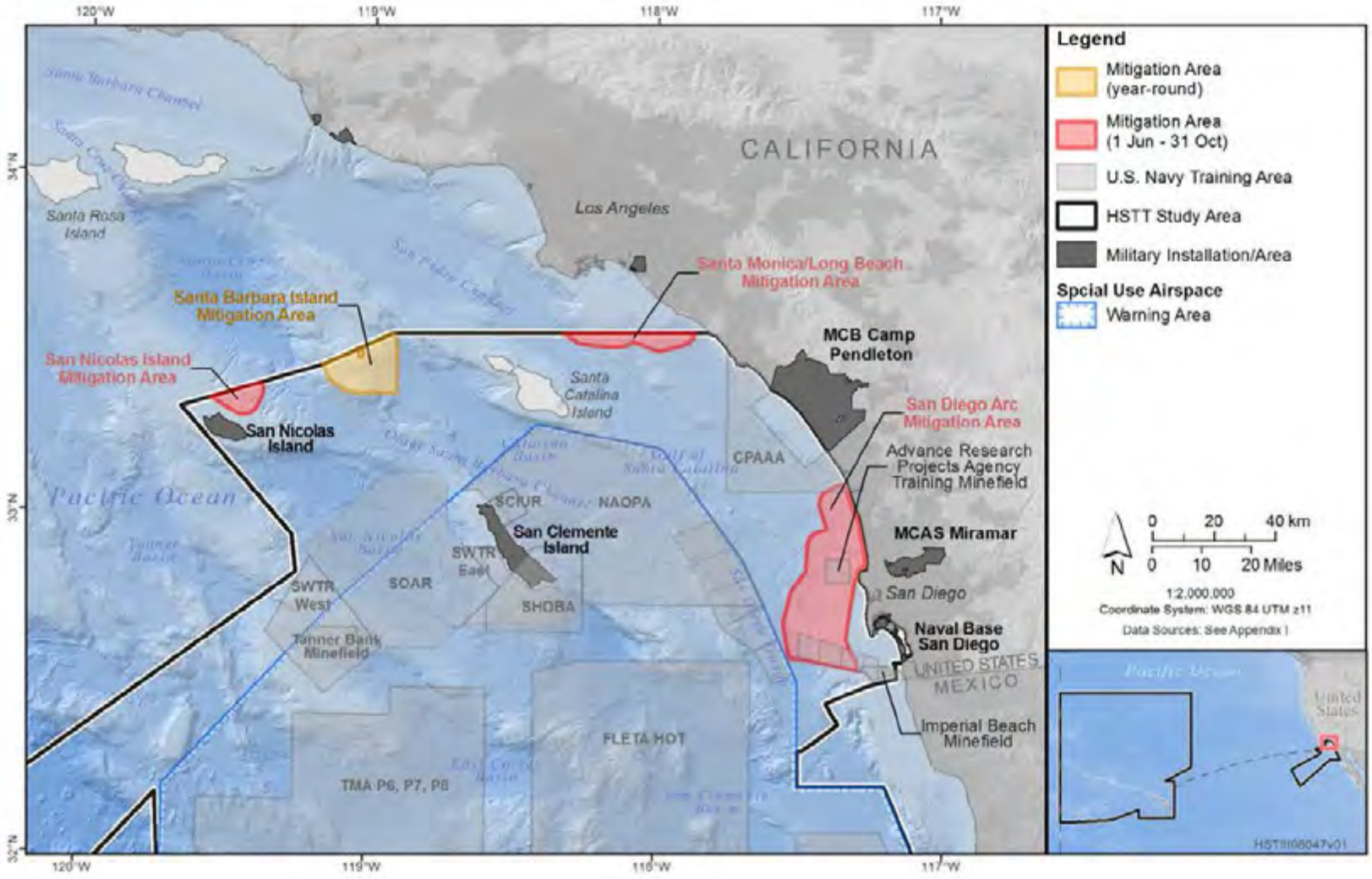


Figure K.2-1: Mitigation Areas to be Implemented in the Southern California Portion of the Study Area

NWS = Naval Weapons Station; MCB = Marine Corps Base; MCAS = Marine Corps Air Station; CPAAA = Camp Pendleton Amphibious Assault Area; TMA = Technical Maneuvering Area; FLETAHOT = Fleet Training Area Hot; SOAR = Southern California Anti-Submarine Warfare Range; CPAVA = Amphibious Vehicle Training Area; SWTR = Shallow Water Training Range; SHOBA = Shore Bombardment Area

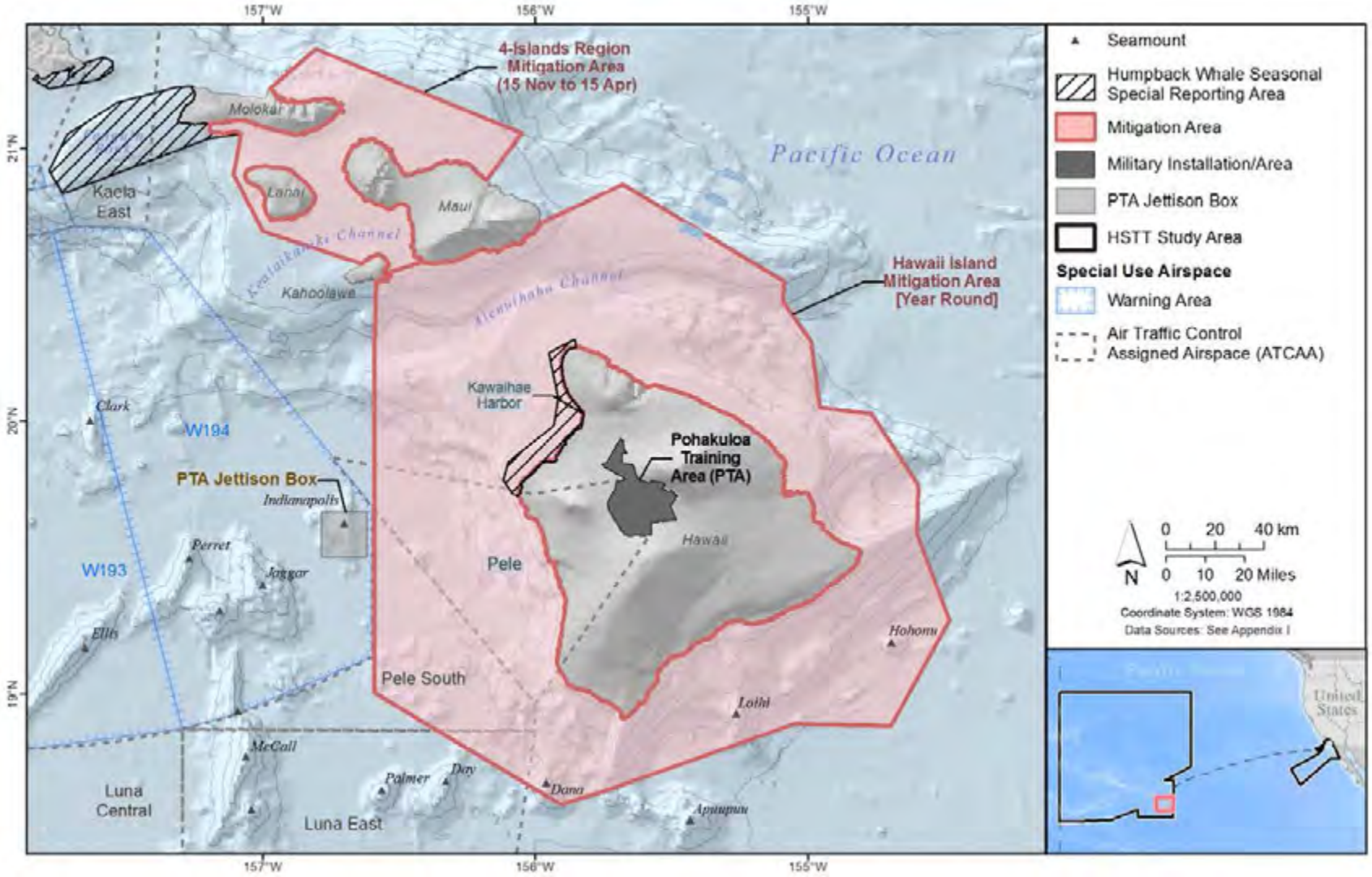


Figure K.2-2: Mitigation Areas to be Implemented in the Hawaii Portion of the Study Area

Table K.2-1: Mitigation Areas Proposed to be Implemented in the Study Area

Mitigation Area Name	Species Protected	Mitigation	Time of Year
San Diego Arc, San Nicolas Island, and Santa Monica/Long Beach	Blue whales	The Navy will not conduct more than 200 hours of surface ship hull-mounted mid-frequency active sonar (MF1) or use explosives during gunnery (large-caliber), torpedo, bombing, and missile exercises (including 2.75-inch rockets)[1]	Jun 1–Oct 31
Santa Barbara Island	All protected species within 6 NM of Santa Barbara Island (as part of the Channel Islands National Marine Sanctuary and Santa Barbara MPA)	Surface ship hull-mounted mid-frequency active sonar (MF1) and explosives during gunnery (all caliber), torpedo, bombing, and missile exercises (including 2.75-inch rockets) during ULT and MTEs only and does not apply to testing events	Year-round
Hawaii Island	Main Hawaiian Islands insular false killer whale, Cuvier and Blainville's beaked whales, humpback whales, pygmy killer whale, dwarf sperm whale, melon-headed whale, short-finned pilot whale, and dolphin species	The Navy will not exceed more than 300 hours of surface ship hull-mounted mid-frequency active sonar (MF1) and 20 hours of dipping sonar (MF4) or use explosives during training and testing[2]	Year-round
4-Islands Region	Humpback whale, main Hawaiian Islands insular false killer whale, and dolphin species	The Navy will not use surface ship hull-mounted mid-frequency active sonar (MF1) or explosives during training and testing[2]	Nov 15–Apr 15 (MF1 only) Year-round (for explosives)

Notes: MPA = Marine Protected Area; ULT = unit-level training; MTE = major training exercise; NM = nautical mile.

[1] The 200-hour cap on MF1 includes the San Diego Arc and the portions of the Santa Monica to Long Beach and San Nicolas Island blue whale feeding biologically important areas that are within the Southern California portion of the HSTT Study Area. For those areas only, the restrictions on explosives apply only during ULT and MTEs and not testing activities.

[2] Explosive restrictions for the Hawaii Island and 4-Islands Region Mitigation Areas apply only to those activities for which the Navy seeks MMPA authorization (e.g., surface-to-surface or air-to-surface missile and gunnery events, bombing exercise, and mine neutralization).

Table K.2-2: Comparison of HSTT Phase II Mitigation/Settlement Areas to Phase III Proposed Mitigation Areas by Species and Biologically Important Areas

Species	Biologically Important Area	Phase II Mitigation/Settlement Area	Proposed Phase III Mitigation Area
Hawaii			
Humpback whales	Reproduction Area: Northwest Kauai	Humpback Whale Special Reporting Area	Humpback Whale Special Reporting Area
	Reproduction Area: East Niihau	Humpback Whale Special Reporting Area	Humpback Whale Special Reporting Area
	Reproduction Area: North Oahu	Humpback Whale Special Reporting Area	Humpback Whale Special Reporting Area
	Reproduction Area: Southeast Oahu	Settlement Area 2-A and 2-D/ Humpback Whale Special Reporting Area	Humpback Whale Special Reporting Area
	Reproduction Area: 4- Islands Region and Penguin Bank	Settlement Area 2-A and 2-B/ Humpback Whale Special Reporting Area/ Humpback Whale Cautionary Area	4-Islands Region Mitigation Area/ Humpback Whale Special Reporting Area
	Reproduction Area: Northwest Hawaii Island	Settlement Area 1-B, 1-C, and 1-D/Humpback Whale Special Reporting Area	Hawaii Island Mitigation Area/Humpback Whale Special Reporting Area
Dwarf sperm whales	Small and Resident Population Area: Hawaii Island	Settlement Area 1-C, 1-D, 1-E, and 2-E	Hawaii Island Mitigation Area
False killer whales	North and West of Hawaii Island False Killer Whale Small and Resident Population Area	Settlement Area 1-A through 1-E, 2-E, and 2-A through 2-D	Hawaii Island Mitigation Area
	4-Islands Region False Killer Whale Small and Resident Population Area	Settlement Area 1-A through 1-E, 2-E, and 2-A through 2-D	4-Islands Region Mitigation Area (partially, Areas 1-A through 1-E and Areas 2-B and 2-C only)
	North and East of Oahu False Killer Whale Small and Resident Population Areas	None	None
Pygmy killer whales	Small and Resident Population Area: Hawaii Island	Settlement Area 1-A, 1-C, 1-D, 1-E, and 2-E	Hawaii Island Mitigation Area
Short-finned pilot whales	Small and Resident Population Area: Hawaii Island	Settlement Areas 1-A through 1-D	Hawaii Island Mitigation Area
Cuvier's beaked whales	Small and Resident Population Area: Hawaii Island	Settlement Areas 1-A through 1-D	Hawaii Island Mitigation Area

Table K.2-2 Comparison of HSTT Phase II Mitigation/Settlement Areas to Phase III Proposed Mitigation Areas by Species and Biologically Important Areas (continued)

Species	Biologically Important Area	Phase II Mitigation/Settlement Area	Proposed Phase III Mitigation Area
Blainville's beaked whales	Small and Resident Population Area: Hawaii Island	Settlement Areas 1-A through 1-E, and 2-E	Hawaii Island Mitigation Area
Common bottlenose dolphins	Small and Resident Population Area: Kauai and Niihau	None	None
	Small and Resident Population Area: Hawaii Island	Settlement Areas 1-A through 1-E, and 2-E	Hawaii Island Mitigation Area
	Small and Resident Population Area: Oahu	Settlement Area 2-D	None
	Small and Resident Population Area: 4-Islands Region	Settlement Area 2-A through 2-C	4-Islands Region Mitigation Area (partially-Areas 2-A and 2-B only)
Pantropical spotted dolphins	Small and Resident Population Area: Hawaii Island	Settlement Area 1-C through 1-E and 2-E	Hawaii Island Mitigation Area
	Small and Resident Population Area: 4-Islands Region	Settlement Area 2-B	4-Islands Region Mitigation Area
	Small and Resident Population Area: Oahu	None	None
Spinner dolphins	Small and Resident Population Area: Kure and Midway Atolls	None	None
	Small and Resident Population Area: Pearl and Hermes Reef	None	None
	Small and Resident Population Area: Kauai and Niihau	None	None
	Small and Resident Population Area: Oahu and 4-Islands Region	Settlement Areas 2-A through 2-D, and 1-B	4-Islands Region Mitigation Area (partially, Area 1-B and Areas 2-A and 2-B only)
	Small and Resident Population Area: Hawaii Island	Settlement Areas 1-A through 1-E, and 2-E	Hawaii Island Mitigation Area
Rough-toothed dolphins	Small and Resident Population Area: Hawaii Island	Settlement Area 1-C through 1-E	Hawaii Island Mitigation Area (except overlap with Warning Area 194)

Table K.2-2 Comparison of HSTT Phase II Mitigation/Settlement Areas to Phase III Proposed Mitigation Areas by Species and Biologically Important Areas (continued)

Species	Biologically Important Area	Phase II Mitigation/Settlement Area	Proposed Phase III Mitigation Area
Southern California			
Blue whales	Feeding Area: Santa Monica Bay to Long Beach	Settlement Area 3-C	Santa Monica/Long Beach Mitigation Area (partially, which is included in the MF1 hours cap for the combined areas) (June–October)
		California Coastal Commission (CCC) 3 nautical mile (NM) Area	Santa Monica/Long Beach Mitigation Area (partially, which is included in the MF1 hours cap for the combined areas) (June–October)
	Feeding Area: San Nicolas Island	Settlement Area 4-A and 4-B	San Nicolas Island and Santa Barbara Island Mitigation Areas (partially for area 4-A, which is included in the MF1 hours cap for the combined areas) (June–October)
	Feeding Area: Tanner-Cortes Bank	Settlement Area 4-C	None
	Feeding Area: San Diego Arc	Settlement Area 3-A through 3-C	San Diego Arc Mitigation Area (partially, which is included in the MF1 hours cap for the combined areas) (June–October)
		CCC 3 NM area, and San Diego Arc	San Diego Arc Mitigation Area (partially, which is included in the MF1 hours cap for the combined areas) (June–October)
Perrin's beaked whales	Northern Catalina Basin and waters southeast of Santa Catalina Island (approx. lat/long 33.28N, 118.25W based on location of HARP [Bauman-Pickering et al. 2015])	None	None

Table K.2-2 Comparison of HSTT Phase II Mitigation/Settlement Areas to Phase III Proposed Mitigation Areas by Species and Biologically Important Areas (continued)

Species	Biologically Important Area	Phase II Mitigation/Settlement Area	Proposed Phase II Mitigation Area
Gray whales	Migration Area: Southern California Bight	Settlement Areas 3-A through 3-C and 4-A through 4-D	San Diego Arc Mitigation Area (3-A, 3-B, and 3-C partially; and 4-B and 4-C partially) (June–October)
		CCC 3 NM area, Channel Island Area, and San Diego Arc	Partially – Santa Barbara Island Mitigation Area and San Diego Arc Mitigation Area
		Channel Islands National Marine Sanctuary	Santa Barbara Island Mitigation Area
Cuvier's beaked whales	San Nicolas Basin	4-D partially	None
	Tanner Canyon	None	None
	Santa Cruz Basin	4-A partially	Santa Barbara Island Mitigation Area (partially)
	Santa Catalina Basin	4-B partially	Santa Barbara Island Mitigation Area (partially)
	Southernmost edge of California Current, west of Tanner-Cortes Bank (approx. lat/long of Site E 32.75N, 119.46W)	None	None
	San Clemente Basin (approx. lat/long 32.52N, 118.32 W. based on location of HARP [Bauman-Pickering et al. 2015])	None	None
Fin whales	Fin whales off Southern California between 200 M and 100 M isobaths	None	None

K.2.2.1 Proposed Mitigation Areas within the HSTT Study Area

The Navy will limit the use of the more impactful acoustic sources (surface ship hull-mounted mid-frequency active sonar [MF1 sonar bin], dipping sonar [MF4 sonar bin], or certain types of explosives during specific activities where applicable) within proposed mitigation areas temporally or year-round when conducting training and testing under the Proposed Action. Annual limits for these sources within specific areas were informed by classified operational and historical reporting data. All other active sonar used by Navy units is allowed.

K.2.2.1.1 San Diego Arc, San Nicolas Island, and Santa Monica/Long Beach Mitigation Areas (Seasonal June 1 – October 31):

The Navy shall not exceed a total of 200 hours of surface ship hull-mounted mid-frequency active sonar (MF1) per season within the combined *San Diego Arc, Santa Monica/Long Beach, and San Nicolas Island Mitigations Area*s from June 1 through October 31, excluding normal maintenance and systems checks which is a small fraction of the overall sonar use in the mitigation area. The 200-hour limit represents 2 percent of the combined annual total of training and testing surface ship hull-mounted mid-frequency active sonar hours (MF1) under Alternative 1 [Preferred Alternative].

Should national security present a requirement to conduct more than 200 hours of MF1 (with the exception of active sonar maintenance and systems checks) per year within the combined mitigation areas from June 1 to October 31, naval units will obtain permission from the appropriate designated Command authority prior to commencement of the activity. The Navy will provide NMFS with advance notification and include the information (e.g., hours of sonar usage) in its annual activity reports.

In addition, the Navy shall not use explosives that could potentially result in the take of marine mammals during large-caliber gunnery, torpedo, bombing, and missile (including 2.75-inch rockets) activities during training and testing within the *San Diego Arc Mitigation Area*.

Should national security present a requirement to conduct large-caliber gunnery, torpedo, bombing, and missile (including 2.75-inch rockets) activities in the areas in *San Diego Arc Mitigation Area* using explosives from June 1 to October 31, naval units will obtain permission from the appropriate designated Command authority prior to commencement of the activity. The Navy will provide NMFS with advance notification and include the information (e.g., explosives usage) in its annual activity reports.

The Navy shall not use explosives during mine warfare, large-caliber gunnery, torpedo, bombing, and missile (including 2.75-inch rockets) activities that could potentially result in the take of marine mammals during training and testing within the *Santa Monica/Long Beach Mitigation Area*.

Should national security present a requirement to use explosives during mine warfare, large-caliber gunnery, torpedo, bombing, and missile (including 2.75-inch rockets) training and testing activities within the *Santa Monica/Long Beach Mitigation Area* from June 1 to October 31, naval units will obtain permission from the appropriate designated Command authority prior to commencement of the activity. The Navy will provide NMFS with advance notification and include the information (e.g., explosives usage) in its annual activity reports.

The Navy shall not use explosives that could potentially result in the take of marine mammals during mine warfare, large-caliber gunnery, torpedo, bombing, and missile (including 2.75-inch rockets) activities during training activities only within the *San Nicolas Island Mitigation Area.* This measure does not apply to testing events.

Should national security present a requirement to use explosives during mine warfare, large-caliber gunnery, torpedo, bombing, and missile (including 2.75-inch rockets) within the *San Nicolas Island Mitigation Area* during training activities from June 1 to October 31, naval units will obtain permission from the appropriate designated Command authority prior to commencement of the activity. The Navy will provide NMFS with advance notification and include the information (e.g., explosives usage) in its annual activity reports.

The measures described above are designed to restrict certain types of explosives as a means for providing additional protection for Endangered Species Act-listed blue whales which have been documented foraging in these areas seasonally.

These geographic mitigation measures address recommendations proposed during the DEIS/OEIS and Proposed Rule (under MMPA) public comment periods.

K.2.2.1.2 Santa Barbara Island Mitigation Area (Year-round):

A *Santa Barbara Mitigation Area* (Figure K.2-1) surrounding Santa Barbara Island out to 6 NM (area represents the only portion of Channel Islands National Marine Sanctuary within the Southern California portion of the HSTT Study Area and includes the marine conservation area overlapping the Sanctuary) would be established where the Navy shall not use any surface ship hull-mounted mid-frequency active sonar (MF1) or explosives that would potentially result in the take of marine mammals used in gunnery (all calibers), torpedo, bombing, and missile exercises (including 2.75-inch rockets) during training only. This measure does not apply to testing events.

Should national security present a requirement for the use of mid-frequency active anti-submarine warfare sensor MF1 or explosives in small-, medium-, and large-caliber gunnery; torpedo; bombing; and missile (including 2.75-inch rockets) activities within the *Santa Barbara Mitigation Area* during training for national security, naval units will obtain permission from the appropriate designated Command authority prior to commencement of the activity. The Navy will provide NMFS with advance notification and include the information in its annual activity reports.

This measure is designed to provide additional protection for all protected marine species within 6 NM of Santa Barbara Island, which includes a portion of the Channel Island National Marine Sanctuary and a marine conservation area that fall within the boundary of the Southern California portion of the HSTT Study Area.

K.2.2.1.3 Hawaii Island Mitigation Area (Year-round):

A *Hawaii Island Mitigation Area* (Figure K.2-2) would be established where the Navy shall not exceed 300 hours of surface ship hull-mounted mid-frequency active sonar (MF1) annually within the area. The 300-hour cap represents 2 percent of the combined annual total of training and testing surface ship hull-mounted mid-frequency active sonar (MF1) hours under Alternative 1 [Preferred Alternative]). Additionally, the Navy would not exceed 20 hours of dipping sonar (MF4) per season annually; 20 hours are 2 percent of the combined annual total of training and testing dipping sonar hours under Alternative 1 (Preferred Alternate). This is a year-round measure. In addition to limits on MF1 and M4 sonar hours, the Navy shall not use explosives that would potentially result in the take of marine mammals during training and testing year-round within the mitigation area.

Should national security present a requirement to conduct more than 300 hours of MF1 or 20 hours of MF4 per year, or the use of explosives within the *Hawaii Island Mitigation Area* during training and testing, naval units will obtain permission from the appropriate designated Command authority prior to commencement of the activity. The Navy will provide NMFS with advance notification and include the information (e.g., hours of sonar usage) in its annual activity reports.

This mitigation area was informed by the following recommendations received during the DEIS/OEIS public comment period:

a. Expand the West-Side Hawaii Island Planning Awareness Area westward to protect resident Cuvier's beaked whales and rough-toothed dolphins

b. Limit major training exercises to reduce cumulative exposure in the West-Side Hawaii Island Planning Awareness Area

c. Prohibit use of air-deployed mid-frequency active sonar in the West-Side Hawaii Island Planning Awareness Area

d. Prohibit other sources of mid-frequency active sonar in the West-Side Hawaii Island Planning Awareness Area

e. Prohibit use of air-deployed mid-frequency active sonar in the East-Side Hawaii Island Planning Awareness Area

f. Prohibit other sources of mid-frequency active sonar in the East-Side Hawaii Island Planning Awareness Area

g. Establish protective mitigation areas in critical habitat of insular false killer whales

h. Continue to implement mitigation measures set forth in the 2015 Settlement Agreement for the Alenuihaha Channel (Area 1-B)

i. Prohibit use of air-deployed mid-frequency active sonar within the Alenuihaha Channel

j. Prohibit other sources of mid-frequency active sonar used in major training exercises and by Navy units (e.g., in unit-level training and in maintenance and system checks while in transit) in the Alenuihaha Channel.

k. Establish protective mitigation areas in critical habitat of insular false killer whales

These measures are designed to limit sonar hours for the more impactful source (MF1), and to some extent dipping sonar (MF4), and explosives that could potentially result in the take of main Hawaiian Islands insular false killer whales and two species of beaked whales (Cuvier and Blainville's), which have been documented using this area year-round to support multiple biological functions. Main Hawaiian Islands insular false killer whales are found only in the main Hawaiian Islands and are a critically endangered species. Beaked whales are scientifically shown to be highly sensitive to sonar exposures. This area also overlaps with identified biologically important areas for other marine mammal species such as humpback whale, dwarf sperm whale, pygmy killer whale, melon-headed whale, short-finned pilot whale and dolphin species for which the mitigation area measures would provide additional protection. These geographic mitigation measures address recommendations proposed during the DEIS/OEIS and Proposed Rule (under MMPA) public comment periods.

K.2.2.1.4 4-Islands Region Mitigation Area (Seasonal Nov 15–Apr 15):

The Navy has renamed the Humpback Whale Cautionary Area to the *4-Islands Region Mitigation Area* and proposes to expand the size of the former cautionary area (Figure K.2-3), where permission is required prior to the use of any surface ship hull-mounted mid-frequency active sonar (MF1) during training and testing during the humpback whale reproductive season. The Navy has also extended the season of the mitigation area by one month, beginning November 15 through April 15.

The Navy shall also prohibit the use of explosives that would potentially result in the take of marine mammals during training or testing activities (e.g., surface-to-surface or air-to-surface missile, gunnery events, bomb exercises, and mine neutralization) within the *4-Islands Region Mitigation Area*, year-round.

In addition, the Navy proposes to change the level of authority for who will determine whether surface ship hull-mounted, mid-frequency active sonar or explosives will be allowed in the mitigation area for training or testing for the purpose of national security. Currently, permission is required from the four-star Commander of the U.S. Pacific Fleet. The Navy is amending the requirement so that the Commander, U.S. Pacific Fleet, can delegate this authority to another high-level Command authority for approval prior to using surface ship hull-mounted mid-frequency active sonar or explosives in the mitigation area from November 15 to April 15. The Navy will amend the name and the current language of the Humpback Whale Cautionary Area as follows:

> "Should national security present a requirement for surface ship hull-mounted mid-frequency active sonar (November 15 – April 15) or explosives during training or testing in the 4-Islands Region Mitigation Area, the Navy will require approval from a designated Command authority prior to use in the mitigation area. The designated Command authority will base such authorization on the unique characteristics of the area from a military readiness perspective, taking into account the importance of the area for humpback whales and false killer whales and the need to avoid adverse impacts from surface ship hull-mounted mid-frequency active sonar to the maximum extent practicable. Furthermore, the Command authority conducting the activity will provide specific direction to operational units on required mitigation prior to conducting training or testing in the 4-Islands Region Mitigation Area."

The Navy will continue to provide NMFS with advance notice if training or testing is to occur in the mitigation area, and provide data on the training and testing activities conducted after the completion of the events. On an annual basis, the Navy will provide a report of the total estimated hours (from November 15 through April 15) of surface ship hull-mounted, mid-frequency active sonar if used in the 4-Islands Region Mitigation Area.

This mitigation measure is designed to provide additional protection for humpback whales and main Hawaiian Island insular false killer whales. The Maui/Molokai area (4-Islands Region) is an important reproductive and calving area for humpback whales. Recent scientific research indicates peak humpback whale season has expanded, with higher densities of whales occurring earlier than prior studies had indicated. In addition, a portion of this area has also been identified as biologically important and as critical habitat for the endangered main Hawaiian Island insular false killer whales and extending the season and size of the mitigation area will provide some added protection for these species and others during that timeframe.

These geographic mitigation measures address recommendations proposed during the DEIS/OEIS and Proposed Rule (under MMPA) public comment periods.

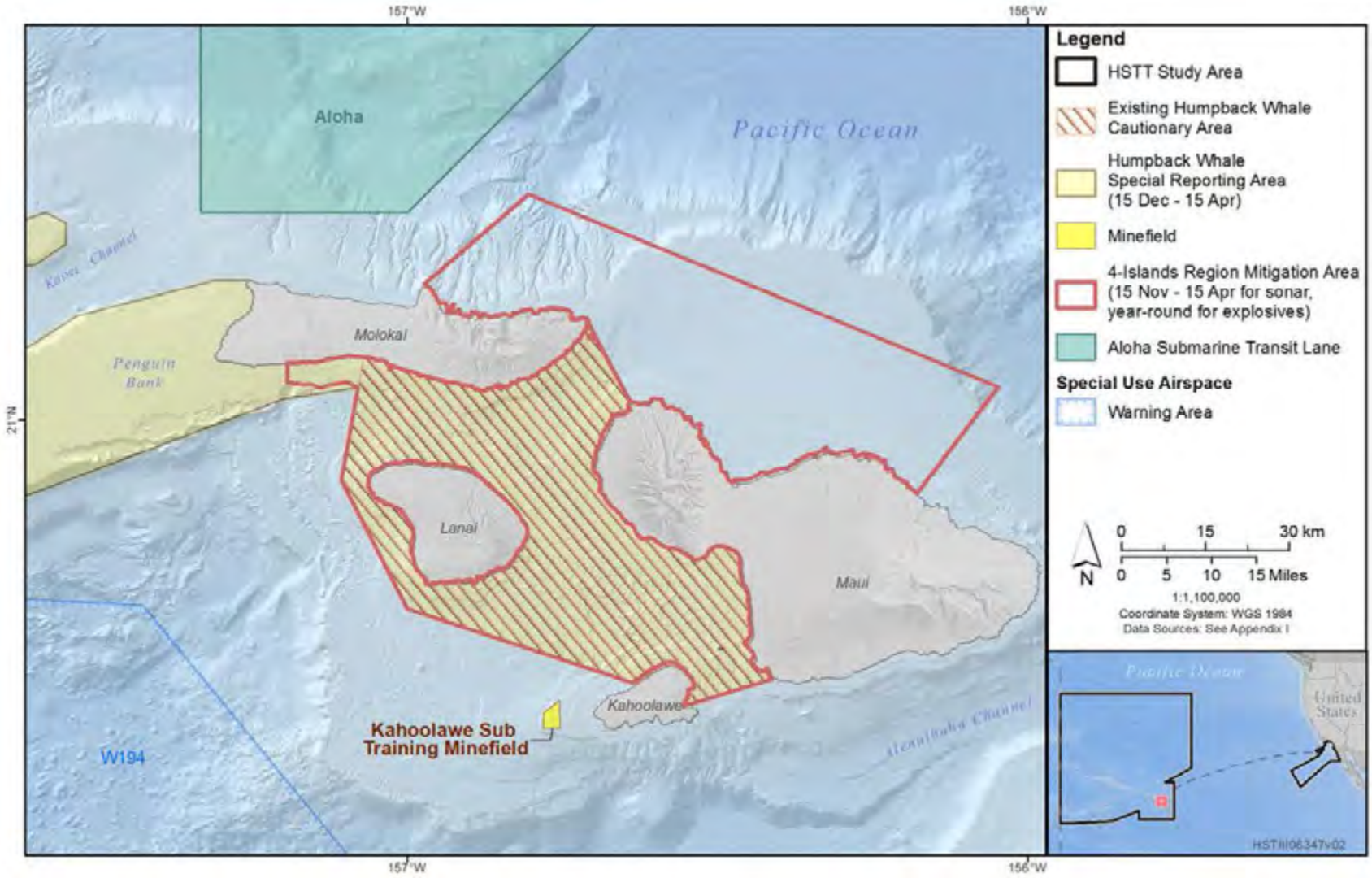


Figure K.2-3: 4-Islands Region Mitigation Area and Proposed Expansion (November 15 – April 15)

K.2.2.2 Awareness Notification Messages

The Navy received comments recommending the Navy implement speed restrictions in specific areas of the HSTT Study Area. As discussed throughout this appendix, the Navy considered this recommendation. It was determined that ship speed restrictions were not operationally practical to implement (see further discussion below within the referenced section regarding this proposed mitigation measure). However, the Navy will commit to issuing awareness notification messages seasonally to alert ships and aircraft to the possible presence of concentrations of large whales in portions of the Study Area. In order to maintain safety of navigation and to avoid interactions with large whales during transit, vessels will be instructed to remain vigilant to the presence of certain large whale species, that when concentrated seasonally, may become vulnerable to vessel strikes. Lookouts will use the information from the awareness notification messages to assist their visual observations of mitigation zones and to aid in implementing procedural mitigation. The Navy anticipates that providing Lookouts additional information about the possible presence of concentrations of large whales in certain locations seasonally will likely help the Navy further avoid interactions with these animals during vessel transit and when training and testing activities are conducted in these areas. The Navy reports all whale strikes within the Study Area, should one occur. Navy will issue awareness notification messages for the following species and seasons:

Southern California portion of the HSTT Study Area:

a. Blue whale – nearshore out to 20 NM from CA mainland (June–October)
b. Gray whales – nearshore out to 10 NM from CA mainland (November–March)
c. Fin whales – nearshore out to 20 NM from CA mainland (November–May)

Hawaii portion of the HSTT Study Area:

a. Humpback Whales – throughout entire Hawaii Range Complex (November–April)

K.2.2.3 Mitigation Considerations

The Navy developed the mitigation areas identified in Table K.2-1 to provide further protection for marine mammals during training and testing activities in areas that the best available science suggests are particularly important to species or stocks for foraging, migrating, or reproduction either year-round or for part of the year (depending on the species). Implementing these mitigation areas off of Southern California and Hawaii would likely be effective in avoiding or reducing adverse impacts on certain marine mammal species, stocks, or populations in these areas, and were determined to be practical to implement without impacting the effectiveness of military readiness. The mitigation could also help the Navy avoid or reduce impacts on other marine species that are present in the mitigation area during certain times of year or year-round.

The proposed mitigation areas are designed to help the Navy further avoid or reduce the level of adverse impacts from sonar or explosives on marine mammals that inhabit, feed in, reproduce in, or migrate through the areas. The Navy does not have the flexibility to relocate, restrict, or limit all training and testing activities everywhere. The Navy acknowledges the importance of certain habitats for species and stocks of marine mammals, particularly for certain biologically important life processes (e.g., foraging, migration, or reproduction) or ecological function, and has balanced the need for certain training and testing environments needed in order to achieve readiness and meet its Title 10 obligations when establishing the proposed mitigation areas.

Training requirements are designed to provide the experience needed to ensure Sailors are properly prepared for operational success. Training requirements have been developed through many years of iteration, lessons learned, and refinement, and are designed to ensure Sailors achieve the levels of readiness needed to properly respond to the many contingencies that may occur during an actual mission. The Proposed Action does not include training beyond levels required for maintaining satisfactory levels of readiness due to the need to efficiently use limited resources (e.g., fuel, personnel, and time). Reductions in training would prevent Sailors from achieving satisfactory levels of readiness needed to accomplish their missions and would increase risk to Sailors when deployed.

Major training exercises, as defined in the EIS/OEIS, are training events that bring together the component elements of a large force (e.g. Strike Group) that could include the full spectrum of the force—various ships, submarines, aircraft, and Marine Corps forces—to train in the complex command, control, operational coordination, and logistics functions designed to prepare the force for deployment. A Strike Group may be composed of up to four to six destroyers and a cruiser, 75 aircraft, and an aircraft carrier, with 7,500 Sailors and Marines participating. They also provide partner building with other maritime nations allowing U.S. military to learn to work with foreign partners across a range of military operations, building interoperability. Therefore, during these types of training events, the Navy requires vast areas of sea and air space which cannot be segmented without reducing the effectiveness of the training or decreasing the safety of personnel. The Navy requires access to a variety of realistic tactical oceanographic and environmental conditions (e.g., varied bathymetry and open sea space) to maximize training effectiveness, meet testing program requirements, and to train to cover and defend large areas of ocean comparable to how the Navy operates during a conflict. With the few number of ships deployed at any given time, the Navy must be able to control the sea and airspace over thousands of square miles relying on sensors and networks.

Training and testing activities must also mimic real world conditions to ensure safety of personnel, skill proficiency, and validation of testing program requirements. Areas for training or testing are chosen to allow for the realistic representation of the myriad training and testing scenarios that Navy units are required to complete to be mission effective. Areas have been chosen and designated based on proximity to associated training ranges (e.g., Southern California Range Complex proximate to San Diego area Navy and Marine Corps bases), available airspace (e.g., avoiding airspace conflicts), unobstructed sea space, or due to safety concerns. For example, military aircraft emergency (divert) landing fields are located to allow for short transits to these fields and hopefully, allow for safe landings in the event of an emergency. These fields also are located away from populated areas in order to prevent mishaps that could put civilians in harm's way. Training areas are often also chosen to avoid areas popular for recreational boating and fishing.

Certain activities, such as deployment certification exercises using integrated warfare components, require large areas of the littorals and open ocean for realistic and safe training. The Operating Areas (OPAREA) within the Study Area represent critical sea space necessary to prepare naval forces for combat. Training and testing in these areas is vital to ensuring that Navy units will be able to operate and defend the U.S. mainland from adversaries.

Expanding mitigation areas to encompass the Navy's existing training and testing areas would require moving activities farther out to sea, which would reduce training and testing opportunities by taking time away from the intended activity to transit to a more distant area. This would also result in training or testing being conducted further offshore in bathymetric and oceanographic conditions that may not accurately reflect the types of environments where real world activities would occur. For example, conducting shallow water anti-submarine warfare training in deep water with simulating fathometer

readings would promote bad habit patterns of ignoring critical depths, and in a real world situation, those readings could be ignored as well, thereby jeopardizing safety and survival of the ship and crew.

Training in shallow water is necessary to develop proper crew coordination and exercise the tactics, techniques and procedures that ensure mission success. Realistic training is essential for crews to experience the effect of bottom topography (upslope vs. downslope) on sonar transmission/returns in general and when detecting targets in constrained environments that simulate environments where the Navy may operate, such as the East and South China Seas or the Strait of Hormuz. For example, transit training in the Alenuihaha Channel replicates those types of strait environments that may be contested by adversaries, and the Navy must learn to operate in them before facing hostile forces. Naval ships must train to counter submarine threats before deployment to ensure the first time a regularly rotating crew conducts anti-submarine warfare training in a strait is prior to being deployed to the Strait of Hormuz or similar areas. There are few geographic areas that enable forces to do this type of training outside of the HSTT Study Area. Newer-generation submarines, operated by more than 40 nations worldwide, continue to be a threat to global commerce, national security, and the safety of U.S. and our allied military personnel. As a result, defense against enemy submarines is a top priority for the Navy. While simulators provide early skill repetition and enhance teamwork, there is no substitute for live training in a realistic environment.

As discussed in Section 5.2.3 (Practicality of Implementation) increasing transit times would also result in additional fuel consumption, increase the Navy's carbon footprint, and increase other expenditures due to wear and tear on equipment and personnel which serve as limiting factors for Navy units, and could decrease valuable on-station training time. Additionally, unit-level training is constrained by the Optimized Fleet Response Plan timeline milestones and increasing time anywhere in the cycle exacerbates the challenges of meeting an already compact schedule. It is also likely that such a strategy would merely shift impacts from one area or species/stock to another.

In summary, further restrictions on the level, number, or timing (seasonal or time of day) of training or testing activities could significantly impact a unit's ability to meet their individual training and certification requirements, the Navy's ability to certify strike groups for deployment in support of national security tasking, the Navy's ability to meet testing program requirements and required acquisition milestones, and operational costs due to increased fuel, maintenance, and time required to complete activities. Constraints on training and testing have the potential to increase safety risks when moving activity locations further offshore and accelerating the fatigue-life of aircraft and other equipment, and can reduce training and testing realism by limiting access to necessary environmental or oceanographic conditions for proper testing and training in tactics, techniques and procedures.

The Navy's responsibility to the American people dictates an efficient use of fiscal resources and an approach that adapts to the evolving security environment, with the ability to make adjustments according to global events. The Navy must be able to successfully operate across the range of military operations, from humanitarian assistance or disaster relief to deterring war or defeating an adversary. The training and testing under the Proposed Action balances the Navy's need to train and test effectively with the Navy's commitment to environmental stewardship.

K.2.2.4 Mitigation Areas Considered and Not Carried Forward

The Navy conducted a detailed review and assessment of each potential mitigation measure individually and then all potential mitigation measures collectively to determine if, as a whole, mitigation will

effectively avoid or reduce potential adverse impacts from the Proposed Action and will be practical to implement.

In addition to other comments received from the public during the review of the Draft HSTT EIS/OEIS, the Navy received comments with recommendations for areas that should be considered for implementing geographic mitigation or other types of mitigation measures. While some of these additional mitigation area measures are not being fully carried forward exactly as proposed, portions of many of the proposals have been considered and have informed the mitigation that will be implemented, as presented in Section K.2.2 (Mitigation Areas to be Implemented). The Navy also received comments regarding the "afforded protection in the Settlement Agreement areas" as discussed above in Section K.1.1.2 (Provisional 2015 Prohibited or Restricted Areas within the HSTT Study Area), where the parties agreed that the Navy would temporarily adhere to certain "prohibitions", such as prohibiting mid-frequency active sonar use during major training events and unit-level training or prohibiting in-water explosives within specific mitigation areas of the HSTT Study Area. The comments suggested that the settlement agreements were more protective than the proposed mitigation areas presented in Section K.2.2 (Mitigation Areas to be Implemented) and therefore should be carried forward fully. The provisional prohibitions and restrictions on activities within the HSTT Study Area were derived pursuant to negotiations with plaintiffs and were specifically not evaluated or selected based on the type of thorough examination of the best available science that occurs through the consultation process under the MMPA, or through analysis conducted for NEPA purposes. The agreement did not constitute a concession by the Navy as to the potential impacts of Navy activities on marine mammals, or any other marine species. Furthermore, the Navy's adoption of restrictions on its activities as part of a relatively short-term settlement does not mean that those restrictions are supported by the best available science, are practical to implement from a military readiness standpoint over the longer term, or should necessarily be carried forward in full or in part. The Navy did however, within this assessment, evaluate the existing temporary settlement areas and other recommendations, using the best available science and operational data to determine the merits of carrying any or all of these mitigations forward for Phase III. The Navy has retained approximately 80 percent of the total area agreed upon during the terms of Settlement Agreement and has strengthened the mitigations within some of these areas to include additional sound sources, and limitations or restrictions on certain types of activities.

The Navy has worked collaboratively with NMFS to develop procedural mitigation to be implemented throughout the HSTT Study Area, as well as using inputs from the operational community, the best available science discussed in Chapter 3 (Affected Environment and Environmental Consequences), published literature, predicted activity impact footprints, and marine species monitoring and density data, to further assess geographic mitigation areas (see Section K.2, [Mitigation Area Assessment]). The Navy completed an extensive biological effectiveness assessment and operational assessment of potential mitigation areas throughout the entire Study Area, including the 2015 Settlement Areas, identified biologically important areas, and considered proposals received during the public involvement process, to determine mitigation measures that are reasonable and prudent. This assessment included detailed and lengthy reviews throughout its development by training experts and leaders responsible for meeting statutory readiness requirements. The mitigation areas identified in Section K.2.2 (Mitigation Areas to be Implemented) represents the maximum mitigation within specifically identified areas that are practical to implement under the Proposed Action. Operational input indicates that designating additional mitigation areas or additional mitigation measures would have an adverse effect on the following:

- the ability of units to meet their individual training and certification requirements (inhibiting their ability to deploy with the required level of readiness necessary to accomplish their operational tasking);
- the Navy's ability to certify strike groups for deployment to meet national security tasking (limiting the flexibility of Combatant Commanders to project power, engage in multi-national operations, and conduct the full range of naval operations in support of national security interests);
- the ability of program managers and acquisition programs to meet testing requirements and required acquisition milestones;
- operational costs (due to extending distance offshore, which would increase fuel consumption, maintenance, and time on station to complete required training and testing activities);
- the safety risk associated with conducting training and testing at extended distances offshore (farther away from critical medical and search and rescue capabilities),
- accelerated material fatigue of aircraft and ships (leading to increased safety risk and higher maintenance costs);
- training and testing realism (due to reduced access to necessary environmental or oceanographic conditions; and,
- the ability of Navy Sailors to train and become proficient in using the sensors and weapons systems they use in real world situations.

Therefore, implementing additional mitigation areas beyond what is described above in Section K.2.2 (Mitigation Areas to be Implemented) would be impractical and would prevent the Navy from meeting its Title 10 obligations to prepare a ready force capable of deterring aggression and winning wars.

The Navy comprehensively reviewed each additional mitigation measure recommended by all comments. Adopting all of the limitations or prohibitions on training and testing suggested by the comments would result in the Navy effectively losing access to a significant majority of the training and testing space required to comply with the Navy's statutory requirement to prepare a ready force. The totality of suggested mitigation measures would essentially prohibit Navy training and testing using sonar and explosives in many of the primary training and testing areas within the HSTT Study Area, leaving fragmented areas and timeframes that are not compatible with effective, realistic training and testing. It is unclear how the Navy would be able to train and test without access to the ranges and locations that have been carefully developed over decades. These areas allow for Navy activities to be conducted in a manner compatible with multiple other activities in the marine environment, such as energy exploration, alternative energy development, commercial fishing, recreational activities, and commercial shipping. As noted in Chapter 2 (Description of Proposed Action and Alternatives) and reiterated throughout this appendix, the Navy also requires extensive sea space so that individual training and testing activities can occur at sufficiently safe distances such that these activities do not interfere with one another and so that Navy units can train to communicate and operate in a coordinated fashion over tens or hundreds of square miles, as they will have to do when in an operational theater. The Navy must also train in these areas because it may be called upon to defend the United States, especially fleet concentration areas that may be primary targets, from direct maritime threats, and the Navy must therefore be familiar with the very waters where it may engage in combat. Hostile naval forces have historically and consistently operated in U.S. waters, during the conflicts

following the U.S.'s independence, the World Wars, and through the Cold War. To this day, foreign naval forces operate in U.S. waters, sometimes clandestinely. To completely ban entire areas from training and testing means the Navy will not be able to train in the very waters where it may need to fight and defend the U.S., thus creating potential sanctuaries where foreign naval forces, and submarines in particular, may operate freely.

K.2.2.4.1 Southern California portion of the HSTT Study Area

As mentioned above in Section K.1.1.4 (Areas Suggested During the Public Involvement Process), the Navy received a variety of comments providing input or recommended changes to proposed geographic mitigation during the Draft EIS/OEIS and Draft Proposed Rule public comment periods, as well as other sources (e.g., California Coastal Commission). The additional mitigation measures proposed by the public and others, that were considered but not carried forward for implementation are summarized below; further detail and analysis is presented in species-specific sections of this appendix as appropriate.

San Diego Arc Planning Awareness Area and Cautionary Area (as proposed in the DEIS/OEIS)

As noted in Section K.2.2 (Mitigation Areas to be Implemented), the Navy has combined and renamed the proposed mitigation areas as the San Diego Arc Mitigation Area and has added additional areas, specifically named as the Santa Monica/Long Beach Mitigation and San Nicolas Island Mitigation Areas. The Navy has committed to limiting its more impactful mid-frequency active sonar sources (MF1) within the San Diego Arc, Santa Monica/Long Beach, and San Nicolas Island Mitigation Areas during the blue whale foraging season (June–October). Analysis of the San Diego Arc and other blue whale feeding areas are provided in Section K.4.1 (Blue Whale Feeding Areas).

1. Extend the seasonality of the San Diego Arc Planning Awareness Area and Cautionary Area periods to June 1 -December 31:

A comment suggested that the cautionary area period for the San Diego Arc be extended to December 31 due to the presence of blue whales. The analysis of the San Diego Arc (and other blue whale feeding areas within the Study Area) included consideration of seasonality and the potential effectiveness of restrictions on mid-frequency active sonar in the area. Based on the analyses contained within this appendix, Navy will implement additional seasonal mitigation within the San Diego Arc, as detailed in Section 5.4.3 (Mitigation Areas for Marine Mammals in the Southern California Portion of the Study Area) and Section K.2.2 (Mitigation Areas to be Implemented), to further avoid or reduce impacts on marine mammals from acoustic and explosive stressors from Navy training and testing in the San Diego Arc. Regarding the older citations in the public comment, providing a basis of concern for blue whales, see the EIS/OEIS and specifically Section 3.7.2.2.2.3 (Population Trends) for discussion of blue whales based on more recent research indicating that the population in the HSTT Study Area may have recovered and has been stable (see (Campbell et al., 2015; Carretta et al., 2015; Carretta et al., 2017; Carretta et al., 2018; Monnahan, 2013; Monnahan et al., 2014; Širović et al., 2015; Smultea, 2014)).

The San Diego Arc and designated seasonality were established during the biologically important area designation process, which included an expert elicitation review of best available science at that time by a panel of leading researchers (Calambokidis et al., 2015). While blue whale calls have been detected in Southern California through December (Lewis & Širović, 2018; Rice et al., 2017), given the large propagation range (10–50 km or more) for low-frequency blue whale vocalizations, blue whale call detection from a single Navy-funded passive acoustic device near the San Diego Arc does not necessarily indicate presence within the Arc during time periods from November through December. In addition,

passive acoustic call detection data does not currently allow for direct abundance estimates. Calls may indicate some level of blue whale presence, but not abundance or individual residency time. In the most recent Navy-funded passive acoustic monitoring report from April 2016 to June 2017, including the sites in the northern San Diego Arc, blue whale call foraging D-call detection near the San Diego Arc reaches a peak from May to June (Rice et al., 2018). This is consistent with previous reporting (Rice et al., 2017; Širović et al., 2015). The foraging call (D-call) discussion is important given the San Diego Arc designation is based on foraging not just presence. While it is true non-foraging blue whale calls are detected through December along with more intermittent foraging calls in the fall (Rice et al. 2018), this dominance of non-foraging calls indicates a blue whale behavioral state with less emphasis on foraging, possibly associated with social interaction and transit. Furthermore, significantly fewer foraging calls and social calls are heard at the San Diego Arc monitoring site compared to more distant, offshore monitoring sites.

The newest Navy-funded research on blue whale movements from 2014 to 2017 along the U.S. West Coast based on satellite tagging has shown that individual blue whale movement is wide ranging with large distances covered daily (Mate et al., 2017; Mate et al., 2018). Blue whales tagged in Southern California ranged from Canada to the eastern tropical Pacific. During this effort, 92 blue whales were tagged during this project, representing approximately 5 percent of the entire Eastern Pacific blue whale stock. While variable by year, average individual blue whale daily movement ranged from 25 to 44 miles per day. Use of the San Diego Arc by blue whales also varied by year, and time spent in the Arc was quite short. Out of 24 whales tagged in 2014, 14 traveled through the Arc. However, individuals stayed within the Arc less than one day to no more than 3.4 days. Only 9 of 22 blue whales traveled through the Arc in 2015 (less than one to three days), no blue whales out of 22 tagged traveled through the Arc in 2016, and only one of 27 tagged blue whales traveled through the Arc in 2017 (less than 0.3 days). Cumulatively, out of the 90 tagged blue whales across all four years (2014–2017), average annual time spent in the San Diego Arc was 1.2 days between July and October. In general, most blue whales start a south-bound migration from the "summer foraging areas" in the mid- to late-fall time period, unless food has not been plentiful, which can lead to a much earlier migration south. Migrations tend to be mostly straight line transits to southern Baja or farther south off the coast of Central America, where whales can continue to feed at a lower level of success to supplement their annual energy needs (Mate et al., 2015; Mate et al., 2016, 2017, 2018).

Therefore, while blue whales have been documented within the San Diego Arc previously, individual use of the area is variable, likely of short duration, and declining after October. Considering the newest passive acoustic and satellite tagging data, there is no scientific justification for extending the designated San Diego Arc Mitigation Area period from October 31 to December 31. Therefore, this mitigation measure would not be biologically effective at reducing adverse impacts to the extent when balanced with the practicality of implementation. Navy research and monitoring funding and the new science it supports continues within the HSTT Study Area under current NMFS permits and is planned to continue into the future.

2. Limit all mid-frequency active sonar:

As noted in Section K.2.2 (Mitigation Areas to be Implemented), the Navy has already committed to limiting mid-frequency active sonar sources (MF1) within the San Diego Arc, Santa Monica/Long Beach, and San Nicolas Island Mitigation Areas during the blue whale foraging season (June–October). While a comment recommended the Navy limit all mid-frequency active sonar in the San Diego Arc, the Navy's mitigation is focused on the more impactful sources most likely to result in takes to marine species,

which are the surface ship hull-mounted sonars (e.g., MF1). As an example from the HSTT Phase III modeling for training, most of the modeled blue whale takes (~ 70 percent) were from Anti-submarine Warfare Tracking Exercise – Ship, Marine Expeditionary Unit Exercises, Composite Training Unit Exercise, Integrated Anti-submarine Warfare Training, and Surface Ship Sonar Maintenance. All these events are dominated by takes primarily associated with MF1. Other events had minor MF1 associated takes, or if dominated by a sonar other than MF1, occur in areas far removed from any of the mitigation areas discussed above.

Other mid-frequency active sonar systems are likely to be used less frequently in the vicinity of the San Diego Arc (and other blue whale feeding areas) than surface ship mid-frequency active sonars. For example, the total number of hours of all other sources of mid-frequency active sonar hours (excluding surface ship hull-mounted mid-frequency active sonar [MF1]) proposed for use in the San Diego Arc is an even smaller percentage of the total hours modeled within the overall Study Area. As discussed in Section K.4.1.5.1 (Navy Requirements for Area Specific Training and Testing), the San Diego Arc is a strategic training and testing area because of its close proximity to San Diego naval bases. Therefore, limiting all other mid-frequency active sonar sources within the San Diego Arc for half of the year, from June 31 through December 31, does not meet the Navy's criteria discussed above in Section K.2.1.3 (Operational Assessment).

A detailed operational assessment for each HSTT mitigation area is contained in relevant sections of this appendix. For the Blue Whale Feeding Areas, see Section K.4.1 (Blue Whale Feeding Areas). Furthermore, the science on behavioral response to sonar has been focused on MF1-like sources for the reasons associated with that source's higher power and prevalence in anti-submarine warfare training and testing. While limiting MF1 sources was found to be practical to implement within specific mitigation areas, the operational assessment (see Section K.4.1.3) found restricting all acoustic sources within these mitigation areas would not be practical to implement.

3. Prohibit use of air-deployed mid-frequency active sonar:

A comment suggested that air deployed mid-frequency sonar be prohibited in the San Diego Arc, based on a recent study on potential behavioral disturbances to beaked whales. Behavioral responses of beaked whales to dipping and other sonars cannot be universally applied to other species, including blue whales within the San Diego Arc. Navy-funded behavioral response studies of blue whales to simulated surface ship sonar have demonstrated that there are distinct individual variations as well as strong behavioral state considerations that influence any response or lack of response (Goldbogen et al., 2013b). The only helicopter dipping sonar activity that would likely be conducted in the San Diego Arc area is a Kilo Dip, which occurs relatively infrequently and involves a functional check of approximately 1–2 pings of active sonar before moving offshore beyond the San Diego Arc to conduct the training activity. During use of this sonar, the Navy will implement the procedural mitigation as described in Section 5.3.2.1 (Active Sonar). The Kilo Dip functional check needs to occur close to Naval Air Station North Island in San Diego to ensure all systems are functioning properly before moving offshore. This ensures proper system operation, avoids loss of limited training time, and reduces fuel expenditure and cumulative engine use in the event of equipment malfunction. The potential effects of dipping sonar have already been thoroughly and quantitatively accounted for in the Navy's acoustic effects analysis.

Furthermore, due to lower power settings for dipping sonar, potential temporary threshold (TTS) shift ranges of dipping sonar are significantly shorter than surface ship sonars. For example, the average modeled range to effect to TTS for dipping sonar (e.g., AQS-22 ASW) for a 1-second ping on low-

frequency cetacean (i.e., blue whale) is 77 m (Table 3.7-7). This range is easily monitored for large whales by a hovering helicopter and is accounted for in the Navy's proposed mitigation ranges for dipping sonars. Limited ping time and lower power settings would therefore limit the impact from dipping sonar to any marine mammal species.

The Navy relied upon the best science that was available to develop behavioral response functions in consultation with NMFS for the EIS/OEIS. Falcone et al., (2017) which was the basis for the recommendation to prohibit air-deployed mid-frequency active sonar (e.g., MF4) was not available at the time the DEIS/OEIS was published. The new information and data presented in the article were thoroughly reviewed when it became available and further considered in discussions with some of the paper's authors following its first presentation in October 2017 at a recent scientific conference. Furthermore, the review of existing data sets for development of the behavioral risk functions showed that mysticetes such as blue whales are less sensitive to behavioral disturbance than beaked whales. For more information on the development of behavioral risk functions, see the 2017 Criteria and Thresholds for U.S. Navy Acoustic and Explosive Effects Analysis (Phase III) available on the HSTT EIS/OEIS website (www.hstteis.com). Many of the confounding variables requiring further analysis for beaked whales and dipping sonar impact assessment are still being researched under continued Navy funding through 2019. It is important to note that the small portion of designated Kilo dip areas that overlap the southern part of the San Diego Arc are not of sufficient depth for preferred habitat of beaked whales (see Figure 2.1-9 in the EIS/OEIS). Navy-funded satellite tracking of blue whales in Southern California and along the west coast from 2014 to 2017 documented extensive daily movements by individual blue whales (Oregon State University, personal communication).

Given the infrequent use of and low residency of blue whales within the San Diego Arc, as well as the high degree of daily movement; the increased sightability of these large baleen whales especially if foraging; less frequent use of the San Diego Arc by other lower-powered, short-duration Navy mid-frequency active sonar systems and low use of the San Diego Arc for more intensive surface ship sonar events, existing Navy mitigations for all sonar systems; and proposed geographic limitations for the more impactful surface ship sonar, further restrictions for other mid-frequency active sonar systems in the San Diego Arc are not warranted.

4. Prohibit use of low-frequency active sonar:

The Navy received a comment on prohibiting all low-frequency sonar in the San Diego Arc. At issue, as stated in the comment, is that blue whales are thought to be vulnerable to low-frequency active sonar. The Navy proposes to operate unmanned underwater and surface systems and test various types of intelligence, surveillance, and reconnaissance systems and underwater communications systems in the San Diego Arc year-round. These unmanned vehicles and intelligence, surveillance, and reconnaissance, and communications tests can include underwater acoustic communications hardware, position and navigation systems, and other sources in the mid-frequency range, as well as sound projectors in the mid- and low frequency range. These sources are typically low-powered (less than 200 dB source level). The San Diego Arc offers the bathymetric and oceanographic conditions required for this testing and is in close proximity to Navy facilities and waterfront infrastructure located on Point Loma in San Diego. It is necessary that testing capabilities be maintained in the San Diego Arc off Point Loma to retain access to shore-based assets and to minimize offshore travel for small vessels and boats that monitor unmanned vehicles and surface systems for safety and daily return to shore.

As discussed in Section 3.7.3.1.1.5 (Behavioral Reactions), studies found only short-term responses to low-frequency sound by some fin and humpback whales, including changes in vocal activity and avoidance of the source vessel, while other fin, humpback, and blue whales did not respond at all. When the source was in the path of migrating gray whales they changed course up to 2 km to avoid the sound, but when the source was outside their path, little response was observed (Clark & Fristrup, 2001; Croll et al., 2001; Fristrup et al., 2003; Miller et al., 2000; Nowacek et al., 2007).

The Navy has been conducting training and testing in these areas at similar levels of activity for decades and does not anticipate population-level impacts to marine mammals from the Proposed Action. Restrictions on the use of low-frequency active sonar would have a significant impact on the testing of current systems and the development of new systems. This would deny research, testing, and development program managers the flexibility to rapidly field or develop necessary systems requiring testing in the area. Therefore, implementing additional mitigation areas beyond what is described in Section K.2.2 (Mitigation Areas to be Implemented) would not be practical.

5. Require vessel speed restrictions within the San Diego Arc Cautionary Area (as proposed in the Draft EIS/OEIS).

This was proposed in comments due to concern over vessel strikes to blue whales in the San Diego Arc. The presence and transits of commercial and recreational vessels, numbering in the many hundreds, far outnumber those of Navy vessels. To the best of the Navy's knowledge, there have been no blue whale ship strikes within the San Diego Arc from any source, civilian or military. Furthermore, no blue whale mortality and injuries were attributed to Navy or commercial ship strikes in California waters in the most recent reporting period between 2011 and 2015 (Carretta et al., 2017). Of note, there has been no confirmed Navy ship strike to a blue whale in the entire Pacific over the 13-year period from 2005 to 2018. Additionally, as detailed in the analysis in the EIS/OEIS Section 3.7.3.4.1 (Impacts from Vessels and In-Water Devices) and in Section K.4.1.6.2 (San Diego [Arc] Blue Whale Feeding Area Mitigation Considerations), there are important differences between most Navy vessels and their operation compared to commercial ships that individually make Navy vessels much less likely to strike a whale. Based on an analysis of Navy ship traffic in HSTT between 2011 and 2015, the median speed of all Navy vessels within Southern California is typically already low, with median speeds between 5 and 12 knots. However, Navy vessel operators must be able to test vessels in such a manner to ensure their ability to operate vessels as they would in real world combat situations, including being able to react to changing tactical situations and evaluate system capabilities. Furthermore, testing of new platforms requires testing at the full range of propulsion capabilities and is required to ensure the platform meets contract requirements.

Furthermore, Navy vessels are required to operate in accordance with applicable navigation rules, including Inland Navigation Rules (33 Code of Federal Regulations 83) and International Regulations for Preventing Collisions at Sea (72 COLREGS), which were formalized in the Convention on the International Regulations for Preventing Collisions at Sea, 1972. These rules require that vessels proceed at a safe speed so proper and effective action can be taken to avoid collision and so vessels can be stopped within a distance appropriate to the prevailing circumstances and conditions. In addition to complying with navigation requirements, Navy ships transit at speeds that are optimal for fuel conservation, to maintain ship schedules, and to meet mission requirements. Vessel captains use the totality of the circumstances to ensure the vessel is traveling at appropriate speeds in accordance with navigation rules. Depending on the circumstances, this may involve adjusting speeds during periods of reduced visibility or in certain locations.

As discussed in Section 3.0.3.3.4.1 (Vessels and In-Water Devices), in general large Navy ships typically operate at average speeds of between 10 and 15 knots, which for reference is slower than large commercial vessels, such as container ships that steam at approximately 24 knots during normal operations (Maloni et al., 2013). Based specifically on an analysis of Navy ship traffic in the HSTT Study Area between 2011 and 2015, median speed of all Navy vessels within Southern California is typically already low, with median speeds between 5 and 12 knots. Slowest speeds occurred closer to the coast, including the general area of the San Diego Arc and approaches to San Diego Bay. Operating vessels at speeds that are not optimal for fuel conservation or mission requirements would be unsustainable due to increased time on station and increased fuel consumption. Each ship has a limited amount of time that it can be underway based on target service requirements and ship schedules. Ship schedules are driven largely by training cycles, scheduled maintenance periods, certification schedules, and deployment requirements. Because of the complex logistical considerations involved with maintaining ship schedules, the Navy does not have the flexibility to extend the amount of time that ships are training and testing, which would result from vessel speed restriction mitigation. If the Navy were to incorporate vessel speed restrictions into event planning for approximately 3–6 months out of the year, ships would be unable to meet all of their requirements during their limited time available for training and testing. This would hold true even if the restrictions only applied to transits to and from training or testing event locations and not during the events themselves. Therefore, it would not be practicable for the Navy to implement speed restrictions within the San Diego Arc or other proposed mitigation areas.

As described in Section 5.3.4.1 (Vessel Movement), additional vessel speed restrictions would prevent vessel operators from gaining handling proficiency, would prevent the Navy from properly testing vessel capabilities, and would increase required the time on station during training or testing events to build skill proficiency or properly test vessel capabilities (which would significantly increase fuel consumption); therefore, the proposed mitigation would have significant impacts on the Navy's ability to train and test, and would prevent the Navy from meeting its mission requirements.

As discussed in Section K.2.2.2 (Awareness Notification Messages), the Navy is proposing to issue awareness notification messages seasonally to alert ships and aircraft to the possible presence of concentrations of large whales in portions of the Study Area. In order to maintain safety of navigation and to avoid interactions with large whales during transit, vessels will be instructed to remain vigilant to the presence of certain large whale species, that when concentrated seasonally, may become vulnerable to vessel strikes. Providing lookouts with additional information about the possible presence of seasonal concentrations of large whales in certain locations will likely assist the Navy further avoid interactions with these animals during vessel transits and when training and testing activities are conducted in these areas. The Navy would report whale strikes within the Study Area, should one occur. The Navy will issue seasonal awareness notification messages for blue whales, fin whales and gray whales throughout the Southern California portion of the HSTT Study.

Given the success of existing mitigation and protective measures, the documented safe speeds Navy vessel already navigate by, detailed assessments of realistic training and testing requirements, and the anticipated adverse impacts on training and testing should further restrictions be imposed, implementing vessel speed restrictions on naval vessels would not be biologically effective at mitigating adverse impacts to marine mammals in the San Diego Arc or practical to implement.

Channel Islands Sanctuary Cautionary Area (as proposed in the DEIS/OEIS)

Based on analysis, the Navy will implement additional mitigation within the Santa Barbara Island Mitigation Area (previously referred to as the Channel Islands Sanctuary Cautionary Area), as detailed in Section K.2.2 (Mitigation Areas to be Implemented) to further avoid or reduce impacts on marine mammals from acoustic and explosive stressors from the Proposed Action. The Navy has proposed to restrict the use of MF1 and some explosives during training within the Santa Barbara Island Mitigation Area, year-round. The mitigation is similar to a condition, proposed by the California Coastal Commission under the Coastal Zone Management Act, for the Santa Barbara Island MPA.

6. Prohibit use of air-deployed mid-frequency active sonar:

The Navy analyzed all mid-frequency active sonar around Santa Barbara Island within the Channel Islands National Marine Sanctuary (see Section K.6.3, 3 NM Santa Barbara Island Area: Area within 3 NM around Santa Barbara Island within the Channel Islands National Marine Sanctuary). As discussed above for the San Diego Arc, air-deployed mid-frequency active sonars (MF4) are likely to be used less frequently in the vicinity of Santa Barbara Island and the more impactful sonar sources (e.g., surface ship hull-mounted mid-frequency active sonar [MF1]) are already prohibited within the Santa Barbara Mitigation Area.

Parameters such as power level and propagation range for typical dipping sonar use are factored into the HSTT acoustic impact analysis along with guild-specific criteria and other modeling variables, as detailed in Section 3.7 (Marine Mammals) of the EIS/OEIS and associated technical reports for criteria and acoustic modeling. Furthermore, due to lower power settings for dipping sonar, the potential behavioral impact ranges of dipping sonar are significantly lower than surface ship sonars. The average modeled range to TTS of dipping sonar for a one-second ping on low-frequency cetacean (i.e., blue whale) is 77 m, and for mid-frequency cetaceans like beaked whales is 22 m (EIS/OEIS Table 3.7-7). This range is easily monitored for marine mammals by a hovering helicopter and is accounted for in the Navy's proposed procedural mitigation ranges for dipping sonars (200 yd. or 183 m) described in Chapter 5 (Mitigation). Limited ping time and lower power settings therefore would limit the impact from dipping sonar to any marine mammal species. The recommendation to prohibit the use of air-deployed mid-frequency active sonar is based on new Navy-funded behavioral response research specific to beaked whales (Falcone et al., 2017). The Navy relied upon the best science that was available to develop behavioral response functions in consultation with NMFS for the EIS/OEIS. The article cited in the comment (Falcone et al., 2017) was not published prior to the time the Draft EIS/OEIS was published, however, the paper's content does not change the current EIS/OEIS criteria or conclusions. The new information and data presented in the article was thoroughly reviewed when it became available and further considered in discussions with some of the paper's authors following its first presentation in October 2017 at a scientific conference. Many variables requiring further analysis for beaked whales and dipping sonar impact assessment are still being researched under continued Navy funding through 2019. Of particular importance, behavioral responses of beaked whales from dipping and other sonars cannot be universally applied to other marine mammal species. Navy-funded behavioral response studies of blue whales to simulated surface ship sonar has demonstrated there are distinct individual variations as well as strong behavioral state considerations that influence any response or lack of response (Goldbogen et al., 2013). It is expected that other species would also have highly variable individual responses to any anthropogenic sound, ranging from some response to no response. This is accounted for in the Navy's current species-specific behavioral response curves described in Section 3.7 (Marine Mammals) of the EIS/OEIS and supporting technical reports.

Given that the portion of the Channel Islands National Marine Sanctuary within the HSTT Study Area is an area of low use of mid-frequency active sonar by the Navy and the ongoing research into the effects from the use of air-deployed mid-frequency active sonars discussed above, the intermittent use of air-deployed mid-frequency active sonar would not significantly affect local populations of beaked whales in this area. Therefore, the proposed additional mitigation beyond what is described in Section K.2.2 (Mitigation Areas to be Implemented) does not meet the criteria discussed in Section K.2.1.2 (Biological Effectiveness Assessment) of being biologically effective.

7. Limit other sources of mid-frequency active sonar:

The Navy's mitigation is focused on the sources most responsible for resulting in takes to marine species, which are the surface ship hull-mounted sonars (e.g., MF1). For example, HSTT Phase III modeled takes were from activities using MF1 conducted outside of the Santa Barbara Mitigation Area.

A detailed operational assessment discussion for each HSTT mitigation area is contained in the species' specific assessments of this appendix. Furthermore, the science on behavioral response to sonar has been focused on MF1-like sources for the reasons associated with that source's higher power and prevalence in anti-submarine warfare training and testing. While limiting MF1 sources was found to be practical for some mitigation areas, the same assessments found restricting all acoustic sources within these mitigation areas would not be practical to implement.

The relatively small area surrounding the Santa Barbara Island Mitigation Area represents less than 0.08 percent of the entire Southern California portion of the HSTT Study Area. An even smaller portion of this area meets the scientifically accepted minimum depth criteria expected for beaked whale habitat, which in Southern California is usually greater than 800 m. The bathymetric area greater than 800 m and within the Santa Barbara Island Mitigation Area is only approximately 24 NM^2 (26 percent of the total Mitigation Area spatial extent or only 0.02 percent of the total Southern California portion of the HSTT Study Area). The small area around Santa Barbara Island does not have resident marine mammals, is not a formally identified biologically important area, nor is it identified as a breeding or persistent foraging location for cetaceans. The science on behavioral response to sonar has been focused on MF1-like sources for the reasons associated with that source's higher power and prevalence in anti-submarine warfare training and testing. While limiting MF1 sources was found to be practical to implement within specific mitigation areas, the operational assessment (see Section K.2.1.3) found restricting all other mid-frequency active sonar sources within this mitigation area would not be practical to implement.

8. Prohibit use of low-frequency active sonar:

The prohibition on the use of low-frequency sonar was suggested because "baleen whales are vulnerable to the impacts of low-frequency active sonar, particularly in calving areas where low-amplitude communication calls between mothers and calves can be easily masked."

As discussed in Section 3.7.3.1.1.5 (Behavioral Reactions), studies found only short-term responses to low-frequency sound by some fin and humpback whales, including changes in vocal activity and avoidance of the source vessel, while other fin, humpback, and blue whales did not respond at all. When the source was in the path of migrating gray whales they changed course up to 2 km to avoid the sound, but when the source was outside their path, little response was observed (Clark & Fristrup, 2001; Croll et al., 2001; Fristrup et al., 2003; Miller et al., 2000; Nowacek et al., 2007).

The Navy proposes to operate unmanned underwater and surface systems and test various types of intelligence, surveillance, and reconnaissance systems and underwater communications systems in the

HSTT Study Area. These unmanned vehicles and intelligence, surveillance, and reconnaissance, and communications tests can include underwater acoustic communications hardware, position and navigation systems, and other sources in the mid-frequency range, as well as sound projectors in the mid- and low frequency range. These sources are typically low powered (less than 200 dB source level). The range to significant behavioral responses from a representative low-frequency source (LF-5) varies from species to species and received sound level (see Table 3.7-10). Given the small spatial area of the Santa Barbara Island Mitigation Area, the low likelihood of large cetaceans within the low-frequency hearing group co-occurring in the area while the Navy is conducting testing, the procedural mitigations for active sonar (200 yd. shut down zone for low-frequency active sonar <200 dB), as well as powering down at further distances when marine mammals are within a certain distance from the vessel), any proposed additional mitigation beyond what is described in Section K.2.2 (Mitigation Areas to be Implemented) does not meet the criteria discussed in Section K.2.1.2 (Biological Effectiveness Assessment) of being biologically effective. Restrictions on the use of low-frequency active sonar would have a significant impact on the testing of current systems and the development of new systems. This would deny research, testing, and development program managers the flexibility to rapidly field or develop necessary systems requiring testing in the area.

9. Implement vessel speed restrictions in the Channel Islands Sanctuary Cautionary Area:

As discussed above and in Section K.2.2.2 (Awareness Notification Messages), the Navy is proposing to issue awareness notification messages seasonally to alert ships and aircraft to the possible presence of concentrations of large whales in portions of the Study Area.

As discussed above for the San Diego Arc, there has not been any Navy ship strike to marine mammals off Southern California in the HSTT Study Area over the 8-year period from 2010 to 2018, and there has never been a Navy strike within the boundary of the Santa Barbara Island Mitigation Area over the course of strike record collection dating back 20 years. Furthermore, to the best of the Navy's knowledge, there have also not been any civilian whale ship strikes in the 6 NM area surround Santa Barbara Island over the period of modern stranding record keeping. If such any strikes did occur in the past, the number would likely be extremely low and they would have been very infrequent. Therefore, ship strike risk to marine mammals transiting through the portion of the Channel Islands Sanctuary within the HSTT Study Area, regardless of source (Navy or civilian), is minimal. Additionally, as detailed in the analysis in the EIS/OEIS Section 3.7.3.4.1 (Impacts from Vessels and In-Water Devices) and as discussed above and elsewhere in this appendix, there are important differences between most Navy vessels and their operation and commercial ships that make Navy vessels much less likely to strike a whale. Navy vessels already operate at the most prudent safe speed possible given a particular transit or activity need. They are also required to avoid large whales by 500 yards, as long as safety of navigation and safety of operations is maintained. Based on an analysis of Navy ship traffic in the HSTT Study Area between 2011 and 2015, median speed of all Navy vessels within Southern California is typically already low, with median speeds between 5 and 12 knots. Slowest speeds occurred closer to the coast and islands.

In order to maintain safety of navigation and to avoid interactions with large whales during transit, vessels will be instructed to remain vigilant to the presence of certain large whale species, that when concentrated seasonally, may become vulnerable to vessel strikes. Providing Lookouts additional information about the possible presence of concentrations of large whales in certain locations seasonally will assist the Navy to further avoid interactions with these animals during vessel transits, when training and testing activities are conducted in these areas. The Navy reports all whale strikes

within the Study Area, should one occur. Navy will issue seasonal awareness notification messages for blue whales, fin whales and gray whales throughout the Southern California portion of the HSTT Study.

Given the lack of population-level impacts to marine species throughout Southern California from Navy activities, lack of significant and repeated use of the small portion of waters within the Santa Barbara Island Mitigation Area by marine mammals, anticipated low individual residency times within the area, application of mitigation and protective measures as outlined in the EIS/OEIS, the documented safe speeds Navy vessel already navigate by, detailed assessments of realistic training and testing requirements and potential adverse impacts on training of further restrictions, additional mitigation would not be any more protective and does not meet the Navy's criteria of being biologically effective to the extent that it is balanced with the practicality of implementation. Please see a more detailed discussion, for the San Diego Arc above, on vessel speed restrictions and the impracticality of being implementable.

10. The Navy will avoid exposing the Channel Island National Marine Sanctuary (including around Santa Barbara Island) to high-intensity active sonar and in-water explosives. 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). For in-water explosives, avoidance means prohibiting all "in-water" explosives:

The above condition proposed by the California Coastal Commission is similar to the Navy's mitigation to restrict the use of surface ship hull-mounted, mid-frequency active sonar in the Santa Barbara Island Mitigation Area and explosives used in small-, medium-, and large-caliber gunnery; torpedo; bombing; and missile (including 2.75-inch rockets) activities during unit-level training or major training exercises.

The Navy is unable to incorporate the proposed 4 km buffer (or other corresponding buffers for less intense sonars). Existing Navy mitigation measures for sonar and explosives are already sufficiently biologically protective against the more severe effects (mortality, permanent threshold shift [PTS], TTS). These effects however are generally confined to areas much closer to the source than 4 km (i.e., <~200 yards for surface ship sonar [MF1]). Behavioral effects at longer ranges are already accounted for in the Navy's DEIS/OEIS analysis and have been determined to not cause population-level long-term effects.

Beaked whale habitat in the Southern California Bight

Navy did provide analysis and consideration of additional geographic mitigation for beaked whales in the San Nicholas Basin Section, see K.7.2 (Southern California Scoping Comment Areas) and specifically Section K.7.2.1 (San Nicolas Basin). Also see EIS/OEIS Section 5.4.1.2 (Mitigation Area Assessment) for additional details regarding the assessments of areas considered for mitigation. Some of the discussions below address similar conditions proposed by the California Coastal Commission, under the Coastal Zone Management Act, for beaked whale habitat.

1. In San Nicolas Basin and north of San Nicolas Basin, the Navy should consider implementing a "refuge" during the next five-year operation period and should consider all possible habitat-based management efforts to address impacts on the population:

The recommendation to create a "refuge" from sonar and explosives is derived from the 2015 Settlement Agreement, where the Navy agreed to implement restrictions on certain activities in "secondary" beaked whale habitat outside of the Navy's Southern California Anti-submarine Range (SOAR). The Navy has been funding Cuvier's beaked whale research in San Nicolas Basin since 2006 (DiMarzio et al., 2018; Schorr et al., 2018; Moretti, 2017). This research is planned to continue for at

least through 2022. Based on visual and photographic ID efforts from 2006 to 2016, over 170 individual Cuvier's beaked whales have been cataloged within San Nicolas Basin. In 2008, researchers began deploying satellite tags as a part of this research. To date, 27 Low-Impact Minimally-Percutaneous External-electronics Transmitting (LIMPET) tags have been deployed within the complex. Twenty-five of those whales were tagged within the San Nicolas Basin and two were tagged in the Catalina Basin. Average transmission duration was 36.6 days (sd = 29.8), with the longest transmitting for 121.3 days. Movement data suggest that Cuvier's beaked whales have a high degree of site-fidelity to the Southern California Range Complex, and the San Nicolas basin in particular. Overall, there were 3,207 filtered location estimates from the 27 tagged whales, 91 percent of which were within the Southern California Range Complex. Fifty-four percent (54 percent) of all location estimates were within the San Nicolas Basin, with 12 tagged whales spending more than 80 percent of their transmission duration within the basin. The two whales tagged in the Catalina Basin never entered the San Nicolas Basin. Only three whales tagged in the San Nicolas Basin crossed into the Catalina Basin (1.3 percent of all locations); two of those whales had just one Catalina Basin location each, though the remaining whale had 28 percent of its locations there. Five whales tagged in the San Nicolas Basin moved into the Santa Cruz Basin for anywhere from 1 to 62 percent of their time (6 percent of all locations). In contrast, 20 of 25 whales tagged in the San Nicolas Basin moved south of the basin at some point. Of these 20 whales, most remained within either Tanner Canyon or the San Clemente Basin immediately to the south, but one traveled north to near San Miguel Island and four traveled south towards Guadalupe Island, Mexico. Three of these whales have not been documented in the San Nicolas basin since, though to date at least six whales tagged in the San Nicolas Basin have been re-sighted there a year or more after the deployment. Additionally, one of the whales that was south of San Nicolas when the tag stopped transmitting has since been sighted three times since.

Complementing the visual and tagging efforts, the Navy has also been funding two separate but related passive acoustic monitoring studies of beaked whale occurrence since 2004 in Southern California, including San Nicolas Basin. Over the 7-year interval from 2010 to 2017, there was no observed change and perhaps a slight increase in annual Cuvier's beaked whale abundance based on passive acoustic detections within San Nicolas Basin (DiMarzio et al., 2018). There does appear to be a repeated dip in population numbers and associated echolocation clicks during the late summer/fall centered around August and September (DiMarzio et al., 2018; Moretti, 2017). A similar August and September dip was noted by researchers using stand-alone off-range bottom passive acoustic devices in Southern California (Rice et al., 2017; Rice et al., 2018; Širović et al., 2016). This dip in abundance is assumed to be tied to some as yet unknown population dynamic or oceanographic and prey availability dynamic, since there are no presumed changes in Navy activities during the months of August and September.

In spite of this short seasonal dip within San Nicolas Basin, there is a documented, recurring number of Cuvier's beaked whales, which strongly indicated that the Navy is not having a population level impact to this species. This is supported by repeated visual re-sighting rates of individuals, sightings of calves and reproductive females, and passive acoustic assessments of steady vocalization rates and abundance over at least the most recent seven-year interval.

In summary, the majority of satellite tagged Cuvier's beaked occurred on the instrumented range (SOAR) in San Nicolas Basin. The erroneous claim for refuge area north of San Nicolas Basin is not supported by the majority of these tracks. It is true some individuals traveled into the northern part of San Nicolas Basin and into Santa Cruz basin for a short period: 5 of the 27 tagged to date out of estimated population that probably numbers in the low hundreds (Moore et al. 2017). It should be remembered,

this is a small sample sized (n=5 of 27), was based on medium term tags which only stay on for multiple weeks so therefore long term occurrence across multiple months to a year is not obtained, and should be taken in context that other individuals from those tagged at San Nicolas basin went south as well. There is no scientific information that the indicated northern areas are more or less important than San Nicolas basin. Movements in and around San Nicolas basin including forays north to Santa Cruz basin could be part of cyclic prey availability or other as yet unknown natural life history function. Given that there is no scientific evidence that Navy training and testing activities are having population level impacts to beaked whales anywhere in the Southern California portion of the HSTT Study Area, the uncertainty of current residence of Cuvier's beaked whales in the areas outside of San Nicolas Basin, the fact that general occurrence of beaked whales in Southern California may not necessarily equate to factors typically associated with biologically important areas (i.e., one area not more important than another), and consideration of the importance of Navy training and testing in the areas around the instrumented range, additional geographic mitigation to create a "refuge" in the recommended area is not scientifically supported. Furthermore, the Navy has already committed to the National Marine Fisheries Service to continue beaked whale research and monitoring within Southern California.

2. In Catalina Basin the Navy should consider implementing a "refuge" during the next 5-year authorization period and should continue to consider all possible habitat-based management efforts to address impacts on the population:

The recommendation is based on a stated concern that this population of Cuvier's beaked whale is "subject to regular acoustic disturbance due to the presence of the Shore Bombardment Area." The water space known as the "Shore Bombardment Area" (SHOBA) off the southern end of San Clemente Island are waters designated as federal Danger and Safety Zones via formal rule making (Danger Zone - 33 CFR 334.950 and Safety Zone - 33 CFR 165.1141) because they are adjacent to the shore bombardment impact area that is on land at the southern end of San Clemente Island. Waters designated as "3803XX" are designated as Safety federal and Restricted Zones via formal rule making (Safety Zone - 33 CFR 165.1141 and Restricted Zone - 33 CFR 334.920), and are associated with the Wilson Cove anchorages and moorings, where ship calibration tests, sonobuoy lot testing, and special projects take place.

The Shore Bombardment Area is a naval gun impact area located on land at the southern end of San Clemente Island. This area is an instrumented land training range used for a variety of bombardment training and testing activities. The in-water administrative boundaries are used for temporary exclusion of vessels for public safety with the delineation of the land impact area where Navy training and testing activity may occur. The water area in Catalina Basin is a controlled zone only designated for safety in the very unlikely event that a round goes over the island and lands in the water. With modern precision munitions, computers, and advanced fire control, that probability is very, very remote. Navy ships use the waters areas south of San Clemente Island (SHOBA West and SHOBA East) to fire into land targets on southern San Clemente Island (see Figure 2.1-8). Only the most southwestern portion of the Catalina Basin partially overlaps with the in-water administrative boundary of the SHOBA, and therefore, the Navy does not anticipate any underwater acoustic disturbance to Cuvier's beaked whales located within the Catalina Basin from in-water explosives or ship firing on the shore-based SHOBA.

The in-water administrative boundary for the SHOBA (West and East) also overlap the Navy's Shallow Water Training Range-East as well as the Laser Training Range-2 as discussed in Section K.7.2.2 (Southern California Public Comment Mitigation Area Assessment). More importantly is that the in-water SHOBA boundaries are in very close proximity to the Southern California Anti-submarine Warfare

Range, the Navy's premier anti-submarine instrumented range for the West Coast as well as other important infrastructure on and around San Clemente Island.

As U.S. surface active sonar capabilities improve, the ability to train surface ship crews in submarine detection, location, tracking, and prosecution will increase. In addition, submarine crews need to train with surface vessels in these areas using mid-frequency active sonar as part of their anti-submarine warfare tactics and active sonar avoidance in shallow water and the adjacent deep water. Submarine commanders and crew train to meet certification objectives. Their requirements evolve as other nation's surface active sonar technologies and capabilities improve and as those nations' active sonar employment increases.

The Catalina Basin remains a unique, critical training area used for strait transit training during integrated events incorporating surface, air, subsurface, and unmanned aerial systems. Sonobuoy quality assurance testing only occurs in a portion of this area because the in-water instrumentation extends to collecting and processing equipment located on San Clemente Island. As stated previously, the basin is important because of the extensive, long-term support infrastructure established on San Clemente Island.

Please see Section 7.2.2.2 (Catalina Basin) for additional biological information and data on beaked whales that may occur within the Catalina Basin. Based on biological and operational practicality assessments, the Navy has determined that the recommendation to create a "refuge" in Catalina Basin does not meet the operational assessment for implementing additional mitigation; however, the Navy will continue funding Cuvier's beaked whale research in San Nicolas Basin as discussed above.

3. In Southernmost edge of the California Current, west of Tanner and Cortez Banks the Navy should establish a seasonal time-area management area for Cuvier's beaked whales between November and June.

Analysis of the Southernmost Edge of the California Current, West of Tanner-Cortes Bank and additional geographic mitigation for Cuvier's beaked whales was addressed in Section K.7.2.3 (Southernmost Edge of California Current, West of Tanner-Cortes Bank) and Section K.7.2.5 (Cuvier's Beaked Whale Habitat Areas Mitigation Assessment). Also see Section 3.7.2.3.24 (Cuvier's Beaked Whale [*Ziphius cavirostris*]) for additional information regarding this species. As noted Section 5.3 (Procedural Mitigation to be Implemented), the Navy will continue to implement procedural mitigation for all military readiness activities throughout the Study Area.

Baumann-Pickering et al. (2014) and Baumann-Pickering et al. (2015b) did not specify this area as biologically important. The author's data only indicated there have been detections of the Cuvier's beaked whales. Almost all suitable deep water habitat >800 m in Southern California could conceivably contain detections of Cuvier's beaked whales. The species is widely distributed within Southern California and across the Pacific. Only limited population information exists for beaked whales including numbers of animals, populations vs. subpopulations determination, and residency time for individual animals (Schorr et al., 2017; Schorr et al., 2018). The science of passive acoustic monitoring is positioned to answer some questions on occurrence and seasonality, but cannot as yet address all fundamental population parameters including individual residency time. Furthermore, while passive acoustic monitoring within Southern California has been ongoing for 28 years, with many sites funded by the Navy, not all sites have been consecutively monitored for each year. All of the single bottom-mounted passive acoustic devices used for the analysis by (Baumann-Pickering et al., 2014; Baumann-Pickering et al., 2015a) and used to support arguments against the use of this area are not continuous and have

various periodicities for which data have been collected. Devices have been deployed and removed from various locations with some sites having multiple years of data, other significantly less with perhaps just a few months out of a year. For instance, Site E was used to justify the additional geographic mitigation area west of Tanner and Cortes Banks but was not continuously monitored over the 28 years. Site E was only monitored for 322 days from September 2006 through July 2009 (slightly less than a full year's worth of data). Site E was also a test site for 63 days from December 2010 through February 2011. For this latest period deployed, Site E was therefore only monitored for approximately 18 percent of a single year between 2010 and 2011. During this test of a passive acoustic array capable of tracking at Site E (west of Tanner and Cortes Banks), (Gassmann et al., 2015) reported detection of only three Cuvier's beaked whales over six separate encounters and for time intervals of 10 to 33 minutes. As single point sources of data, these passive acoustic devices are not indicative of anything more than local and individual snapshots of occurrences of a wide-ranging species. For example, more recent acoustic sampling of bathymetrically featureless areas off Southern California with drifting hydrophones by NMFS detected many beaked whales over abyssal plains and not always associated with slope or seamount features, which counters a common misperception that beaked whales are only found over slope waters, in deep basins, or over seamounts (Griffiths & Barlow, 2016). Nor would older passive acoustic data prior to 2009 be indicative of current or future occurrence especially given the potential impact of climate change on species distributions. To summarize, this limited information may or may not be reflective of current beaked whale distributions within Southern California and into the future. Furthermore, solely passive acoustic detections of beaked whales without additional population parameters can only determine relative occurrence, which could be highly variable over sub-regions and through time. The Navy continues to fund additional passive acoustic field monitoring for beaked whales in Southern California, as well as research advancements for density derivation from passive acoustic data (DiMarzio et al., 2018; Moretti, 2017; Rice et al., 2017; Schorr et al., 2017; Schorr et al., 2018; Širović et al., 2017).

While Cuvier's beaked whales have been detected west of Tanner and Cortes Banks, this species is also detected in most all Southern California locations > 800 m in depth. Furthermore, the Navy has been training and testing in and around Tanner and Cortes Banks with the same basic systems for decades, and there are no indications that Navy training and testing has had any of adverse impacts on populations of beaked whales in Southern California. In particular, a re-occurring population of Cuvier's beaked whales co-exists within San Nicholas Basin to the east, an area with significantly more in-water sonar use than west of Tanner and Cortes Banks. The Navy is proposing to continue beaked whale monitoring and research within the Southern California portion of the HSTT Study Area.

These waters west of Tanner and Cortes Banks are critical to the Navy's training and testing and so it is impractical to limit or reduce access or preclude activities within that water space in the Southern California portion of the HSTT Study Area. Tanner-Cortes Banks is a core high-priority training and testing venue for SOCAL combining unique bathymetry and existing infrastructure. This includes an existing bottom training minefield adjacent to Tanner-Cortes Banks, and future Shallow Water Training Range (SWTR West) expansion. See Section K.7.2.3 (Southernmost Edge of California Current, West of Tanner-Cortes Bank) and Section K.7.2.5 (Cuvier's Beaked Whale Habitat Areas Mitigation Assessment) for discussion regarding impacts on training and impact readiness from further restrictions or limitations.

Given that there is no evidence of significant impacts to populations of beaked whales anywhere in the HSTT Study Area, the uncertainty of current use by Cuvier's beaked whale of the area west of Tanner

and Cortes Banks where general occurrence may not necessarily equate to biological importance, and in consideration of the training and testing impact discussed in the appendix, additional geographic mitigation specifically for the area west of Tanner and Cortes Banks does not meet the Navy's criteria for implementation.

4. In the Northern Catalina Basin (approximate coordinates of 33.28 N., -118.25 W.) and San Clemente Basin (approximate coordinates of 32.52 N., -118.32 W.), both based on location of passive acoustic device (HARP) deployments, the Navy should consider management areas for Perrin's beaked whales:

The Catalina Basin area and Perrin's beaked whales are addressed in Section K.7.2.2 (Catalina Basin) and K.7.2.6.2 (Northern Catalina Basin and Waters Southeast of Catalina Island Perrin's Beaked Whale Habitat Mitigation Considerations). Also see Section 3.7.2.3.29 (Perrin's Beaked Whale [*Mesoplodon perrini*]) for additional information regarding this species. As noted in Section 5.3 (Procedural Mitigation to be Implemented), the Navy will continue to implement procedural mitigation measures for military readiness activities throughout the HSTT Study Area.

All of the single bottom-mounted passive acoustic devices used for the analysis by Baumann-Pickering et al. (2014) and used to support this recommendation are not continuously monitored and have various periodicities for which data have been collected. In other words, some provide multiple years of data, others significantly less, with perhaps just a few months out of a year. As single point sources of data, these passive acoustic detections may not be indicative of biological importance. Nor would older data prior to 2009 be indicative of current or future habitat use given the potential impact of climate change on species distributions.

Navy-funded passive acoustic monitoring within the Southern California Range Complex has been ongoing for over two decades, but not all areas are monitored continuously and devices have been deployed and removed from various locations. Santa Catalina Basin was only monitored from August 2005 to July 2009, a period of four years. Santa Catalina Basin has not been monitored under Navy-funding since 2009 because other areas in Southern California were prioritized for passive acoustic device placement by the researchers. For San Clemente Island, the single monitoring site "S" used in Baumann-Pickering et al. (2014), and cited as the source of the comment's request for additional geographic mitigation in the San Clemente Basin, was only deployed for a limited time resulting in 409 days of data (September 2009–May 2011). For both sites in this area combined, BW43 detections, suspected but not scientifically confirmed as being Perrin's beaked whales, were recorded less than one percent of the approximately five and half years of cumulative monitoring (Baumann-Pickering et al., 2014).

A different Navy-funded single site south-southwest of San Clemente Island near the San Clemente Basin has had a passive acoustic device in place from July 2014 through 2018. Rice et al. (2018) contains the most recent results for the San Clemente Basin site "N" for the period from April 2016 through June 2017. Previous reports include Širović et al. (2016) and Rice et al. (2017) contain the most current results from San Clemente Basin site "N". While Rice et al. (2018) Širović et al. (2016) and Rice et al. (2017) do report periodic passive acoustic detections of Mesoplodon beaked whales (BW43) thought to be Perrin's beaked whale in the area, the overall detection rate, periodicity, and occurrence has not been high. Between July 2017 and June 2017, there were only 10 detections over five days during late fall and winter. Acoustic sampling of bathymetrically featureless areas off Southern California with drifting hydrophones by NMFS detected many beaked whales over abyssal plains and not always associated with slope or seamount features, which counters a common misperception that beaked whales are primarily

found over slope waters, in deep basins, or over seamounts (Griffiths & Barlow, 2016). In addition, analysis of NMFS visual survey data from 2014, the most recent year available, showed an increase in Mesoplodon beaked whales along the entire U.S. West Coast which the authors attributed to an influx of tropical species of Mesoplodon during the unusually warm water condition that year (Barlow, 2016; Moore & Barlow, 2017). Perrin's beaked whale, part of the Mesoplodon guild, could be part of these sightings. In summary, San Clemente Basin and Santa Catalina Basin have similarly low passive acoustic detection rates and are likely to be part of Perrin beaked whale's general distribution along the U.S. West Coast. Their distribution is likely to be wide ranging and highly correlated to annual oceanographic conditions. Santa Catalina and San Clemente basins do have infrequent suspected Perrin's beaked whale passive acoustic detections from a limited number of devices, but data do not suggest that these are biologically important areas warranting geographic protection beyond existing Navy protective measures.

The Navy has been training and testing in and around northern Catalina Basin and waters southeast of Catalina Island with the same basic systems for over 40 years and there is no evidence of any adverse impacts on populations of beaked whales in Southern California. These waters in and around northern Catalina Basin and waters southeast of Catalina Island are critical to the Navy's training and testing and so it is impractical to limit or reduce access or preclude activities within that water space in the Southern California portion of the HSTT Study Area. Additional limitations as discussed in Section K.7.2.2 (Catalina Basin) and K.7.2.6.2 (Northern Catalina Basin and Waters Southeast of Catalina Island Perrin's Beaked Whale Habitat Mitigation Considerations) would limit training and impact readiness. Given there is no evidence of impacts to the population of beaked whales in the area, and low potential occurrence of Perrin's beaked whales in the Southern California portion of the HSTT Study Area, geographic mitigation would not be biologically effective.

Important fin whale habitat off Southern California

The Navy included an analysis of fin whale habitat and ship-strike risk-reduction for fin whales in Section K.7.2.7 (Waters Just off the Mainland Shelf, Between the 200 m and 1,000 m Isobaths). See also Section K.7.2.8 (Fin Whale Area Mitigation Assessment) for more details on the mitigation assessment. Some of the discussions below address similar conditions proposed by the California Coastal Commission, under the Coastal Zone Management Act, for fin whales. The following recommendation was provided in comment on the basis that fin whale populations are at particular risk of ship strike on Navy ranges, given their shallow-water foraging in relatively deep water.

1. In waters between the 200 m and 1000 m isobaths, ship-strike risk-reduction time-area management measures for fin whales should be implemented during the months of November through February:

As described and detailed in Chapter 5 (Mitigations) and discussed above for the San Diego Arc, Navy already implements a number of ship-strike risk reduction measures for all vessels, in all locations and seasons, and for all marine mammal species. Note that the virtually identical recommendation made in a scoping comment and was addressed in Section K7.2.7 (Waters Just off the Mainland Shelf, Between the 200 m and 1,000 m Isobaths) and in Section K7.2.8 (Fin Whale Area Mitigation Assessment). Much of the information as the basis for the comment is incorrect as described fully below.

The recommendation seems to be predicated on the belief that the Southern California Range Complex is a central aggregation point for fin whales, which is not the case. As noted in the technical report "*Quantifying Acoustic Impacts on Marine Mammals and Sea Turtles: Methods and Analytical Approach*

for Phase III Training and Testing" (U.S. Department of the Navy, 2018) and a number of supporting studies (see for example, (Becker et al., 2016; Scales et al., 2017)), the highest density of fin whales in the winter months extends from the waters off Mexico north to the waters off central California; the Southern California Range Complex is a very small subset of the area where fin whales aggregate in the winter. Navy notes that the recommendation cites to additional references (Debich et al., 2015a; Scales et al., 2017; Širović et al., 2015) along with those provided previously in 2016, but those references fail to provide any additional support for the comment, and in fact provide further justification for the position detailed by the Navy in Section K.7.2.7 (Waters Just off the Mainland Shelf, Between the 200 m and 1,000 m Isobaths) and in Section K.7.2.8 (Fin Whale Area Mitigation Assessment). New research by Širović et al. (2017) supports a hypothesis that between the Gulf of California and Southern California there could be up to four distinct sub-populations based on fin whale call types, including a Southern California resident population. There is also evidence that there can be both sub-population shifts and overlap within Southern California (Širović et al., 2017). Scales et al. (2017) also postulated two Southern California sub-populations of fin whales based on satellite tagging and habitat modeling. Scales et al. (2017) stated that some fin whales may not follow the typical baleen whale migration paradigm, with some individuals found in both warm, shallow nearshore waters < 500 m, and deeper cool waters over complex seafloor topographies. Collectively, the author's spatial habitat models with highest predicted occurrence for fin whales cover the entire core training and testing areas in the Southern California portion of the HSTT Study Area, not just areas between 200 and 1000 m.

Results from Navy-funded long-term satellite tagging of fin whales in Southern and Central California still shows some individual fin whales engage in wide-ranging movements along the U.S. West Coast, as well as large daily movements well within subareas (Mate et al., 2017; Mate et al, 2018). During surveys between 2010 and 2017, more fin whale tag locations were reported off the Palos Verdes Peninsula and off of the Los Angeles/Long Beach commercial shipping ports in fall, both areas north of and outside of the Navy's Southern California Range Complex (Falcone & Schorr, 2014a). There were not as many tag locations in the similar isobath region off San Diego associated with the Navy range areas. Falcone and Schorr (2014a) did document an apparent inshore-offshore distribution between winter-spring and summer-fall. Given the apparent resident nature of some fin whales in Southern California as discussed in Falcone and Schorr (2014a); Scales et al. (2017); Širović et al. (2017); Rice et al., (2017); and Schorr et al., (2018), it remains uncertain if the inshore-offshore seasonal pattern as well as sub-population occurrence will persist into the future, or if fin whales will change distribution based on oceanographic impacts on available prey (e.g., El Nino, climate change, etc.).

Since this recommendation differs only slightly from that submitted during the scoping period, the following summary observations regarding both the comments are that: 1) The time-period for the data (in the reference [Figure 3]) as based on Širović et al. (2015) is 2006–2012, not "since 2009" as stated; It should be noted that the data from the various single bottom-mounted passive acoustic devices used in the analysis are not continuous and have various periodicities for which data have been collected. Many of these devices are purposely placed in 200–1000 m of water. Given these are point sources of data, they may or may not be indicative of fin whale calling or presence at other locations within Southern California without devices. Passive acoustic analysis is only useful for those individuals that are calling and may not indicate total population occurrence. Low-frequency fin whale calls by their very nature have relatively long underwater propagation ranges so detections at a single device could account for individuals 10–50 miles away if not further depending on local propagation conditions. This would mean calling whales are not in the 200–1000 m area. Širović et al. (2015) acknowledge in discussing their data biases, that their use of "call index" may best indicate a period of peak calling. But fin whales produce

multiple call types depending on behavioral state. Based on technology limitations, some fin whale call types were not included in Širović et al. (2015); 2) the study cited (Širović et al., 2015) and used as the basis for "Figure 3," concerns trends seen within the Southern California Bight, not exclusively the Southern California Range Complex; 3) the research used as the basis for "Figure 3" was funded by the Navy to develop baseline information for the areas where Navy trains and tests and was by no means designed to or otherwise be intended as a representative sample of waters off California or the entire habitat of the fin whale population in the area; 4) it is not correct to assume detected vocalizations (a "call index") reported in Širović et al. (2015) for fin whales equates with where fin whales are aggregated in the Southern California Bight. For example, the acoustic monitoring data did not pick up or otherwise correspond to the observed seasonal distribution shift of fin whales indicated by visual survey data covering the same time periods (Campbell et al., 2015; Douglas et al., 2014); 5) Širović et al. (2015) make no such claim of aggregations during the winter months but instead compare call index rates and state that the purpose for the paper was to demonstrate that passive acoustics can be a powerful tool to monitor population trends, not relative abundances; and 6) there is no science to support the contention, "that fin whales are at particular risk of ship-strike on the naval range".

Two fin whales were struck by the Navy in 2009 in the Southern California portion of HSTT Study Area as Navy noted in this appendix, but there have been no fin whales struck and in fact no whales of any species struck in the subsequent 9-year period despite a documented increase in the fin whale population inhabiting the area (Barlow, 2016; Moore & Barlow, 2011; Smultea, 2014). Furthermore, one of those vessel strikes occurred at the end of the recommended timeframe (February) and the other well outside the time period (May). Neither of these Navy fin whale strike locations were close to shore (both >50–60 nm from shore), or associated with coastal shipping lanes. Based on an analysis of Navy ship traffic in the HSTT Study Area between 2011 and 2015, median speed of all Navy vessels within Southern California is typically already low, with median speeds between 5 and 12 knots. This includes areas within and outside of 200–1000 m within Southern California, with slowest speeds closer to the coast. As presented in the EIS/OEIS, fin whales are present off all the waters of Southern California year-round (Širović et al., 2015; Širović et al., 2017; Rice et al., 2018). Also note that using available quantitative density and distribution mapping, the best available science at the time, and expert elicitation, definitive areas of biological importance for fin whales could not be determined by a panel of scientists specifically attempting to do so (Calambokidis et al., 2015).

In conclusion, speed restrictions within 200–1000m isobaths are unwarranted given the wide range of fin whale movements, including large scale daily movements, along the U.S. West Coast, including areas within and outside of 200–1000 m contours. As discussed above for the San Diego Arc, the current lack of ship strike risk from Navy vessels in Southern California (2010–2018), the already safe training and testing ship speeds Navy uses within the HSTT Study Area, and existing Navy mitigation measures including provisions to avoid large whales by 500 yards where safe to do so, vessel speed restrictions would not be any more protective than existing mitigation, nor would it be practical to implement.

2. <u>The Navy will avoid exposing the following areas to high–intensity active sonar and in-water explosives. Avoidance will include a 4 km area around San Nicolas Basin fin whale and beaked whale high concentration area, 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). For in-water explosives, avoidance means prohibiting all in-water explosives:</u>

The above was included as a condition from the California Coastal Commission in response to the Navy's consistency Determination for CZMA, based on input to the Commission by other organizations. San Nicolas Basin contains one of only two Navy instrumented ranges in the Pacific Ocean (the other located in Hawaii), and represents an extensive fiscal and logistic investment in infrastructure. The range consists of an array of 178 bottom-mounted hydrophones covering an area of about 1800 km^2. This area is a critical Navy focal area for in-water training and testing that cannot be duplicated or shifted anywhere else without shifting assets at great expense. A more detailed discussion on the importance of San Nicolas Basin to the Navy is contained in Section K.7.2.8 (Fin Whale Area Mitigation Assessment).

The concept of this one basin being the only area where fin whales occur is a misconception based on limited small boat surveys and medium-duration satellite tracking (multiple days-multiple weeks). Fin whales are widely distributed along the West Coast, including numerous locations in the Southern California portion of the Study Area. From new Navy-funded fin whale satellite tracking (2014–2017) using long-term (multiple weeks-multiple months) tags, fin whales have been documented moving significant distances daily in Southern California (up to 20 miles or more per day). New West Coast modeling used in a ship strike risk analysis also shows more fin whales north of the Southern California Range Complex. Therefore, San Nicolas Basin is shown with only a small potential fin whale abundance compared to the rest of their distribution (more on this to follow).

Cuvier's beaked whales have been studied extensively by the Navy in San Nicolas Basin from 2004 through 2018. While there is a documented population of Cuvier's beaked whales that use parts of San Nicolas Basin, research to date has not demonstrated any population-level effects even after some of the most extensive survey effort for any species. Navy field studies have documented many important population parameters including repeated sightings of the same individual and observations of mother-calf pairs including repeated sightings of females with new calves after the first calf has weaned. Furthermore, analysis of passive acoustic data from the Navy instrumented range is ongoing with approximately a decade of beaked whale echolocation detections (an indication of foraging for this species). In a new data review conducted in 2018, there has not been any significant change in Cuvier's beaked whale echolocation within San Nicolas Basin over an 8-year period from 2010 to 2017 in an area heavily used by the Navy. Finally, in a 2018 adaptive management meeting with NMFS, the Navy formally committed to continued beaked whale and fin whale research and monitoring within San Nicolas Basin as well as other areas of SOCAL that have not been surveyed as frequently. The scope of this effort spans 2019–2023. Past and future reports on this monitoring are or will be available on the Navy's public monitoring web page.

The Navy is unable to incorporate the proposed condition because it would not be practical for the Navy to implement, preventing the Navy from meeting testing and training requirements. This position is based on the biological effectiveness and operational assessment discussed in detail in Section K.7.2.8 (Fin Whale Area Mitigation Assessment).

The Navy will, however, include language about San Nicolas Basin fin whale occurrence within a proposed Fin Whale Awareness message to be distributed annually to all Navy units operating in Southern California. This message, along with similar ones for blue whales and gray whales, is intended to identify likely areas whales could be found, along with seasonality if applicable, and emphasize Navy unit adherence to existing mitigation measures and safe navigation.

State and federal Marine Protected Areas

1. The Navy will avoid exposing the Catalina Island MPA, Mainland California Coast MPAs (including Orange County and northern San Diego County, excluding the MPA portion in the San Diego Arc Mitigation Area), and any MPA in or adjacent to the Silver Strand Training Complex to high intensity active sonar and in-water explosives. 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). For in-water explosives, avoidance means prohibiting all in-water explosives in Bins E-6 thru E-13:

The above was also included as a condition from the California Coastal Commission in response to the Navy's consistency Determination for CZMA, based on input to the Commission by other organizations. The Navy discusses Marine Protected Areas (MPA) in Section 6.1.2 (Marine Protected Areas) of the HSTT EIS/OEIS, in which it analyzed potential overlap between Navy activities and MPAs. In accordance with Executive Order 13158, the Navy has considered the potential impacts of its proposed activities under the Proposed Action to the national system marine protected areas that contain marine waters within the Study Area, factoring in Navy standard operating procedures and procedural mitigation when applicable to the stressor and resource. Such mitigation efforts will, to the maximum extent practical, avoid or minimize harm to natural and cultural resources for which these marine protected areas were designated. Relative to potential effects to marine species, excluding marine mammals, most if not all MPA-associated fish and invertebrates would not be able to hear mid- and high-frequency Navy sonar systems.

As stated in the Chapter 6 (Regulatory Considerations) of EIS/OEIS, none of the proposed activities associated with sonar or explosives are conducted in the majority of the Southern California MPAs (see Table 6.1-2 from the EIS/OEIS and in Appendix A, Navy Activity Descriptions).

The Navy is unable to incorporate the proposed condition for the MPA in or adjacent to the Silver Strand Training Complex because it would not be practical for the Navy to implement due to the ongoing and proposed critical activities conducted in this area. The Navy will not commit to any further geographic mitigations to areas in or immediately adjacent to the Silver Strand Training Complex. This area has significant training and testing requirements with a variety of systems and activities. The Silver Strand Training Complex is the premier training facility for the U.S. Special Operations Forces and an area that has been use by the Navy since 1920. The Silver Strand Training Complex is also used for mine sweep and amphibious training, as well as for underwater detonation training and certification because of its sandy bottom and shallow water environment. The Silver Strand Training Complex is also valuable because of its close proximity to other Navy facilities such as Naval Base San Diego and Coronado.

2. Vessel Speed Restrictions within MPAs

As discussed above for other areas for placing speed restrictions (e.g., Santa Barbara Island and San Diego Arc), on Navy activities, there are important differences between most Navy vessels and their operation compared to commercial ships that individually make Navy vessels much less likely to strike a whale. Based on an analysis of Navy ship traffic in HSTT between 2011 and 2015, the median speed of all Navy vessels within Southern California is typically already low, with median speeds between 5 and 12 knots.

While the Navy does not typically operate within the majority of the Southern California MPAs, the Navy already has successful existing mitigation and protective measures to avoid vessel interactions with

marine mammals and operate at safe speeds, therefore, implementing vessel speed restrictions on naval vessels would not be biologically effective at mitigating adverse impacts to marine mammals in the MPAs or are practical to implement.

Additional Coastal Area within 1 km (0.5 NM) from shore to protect coastal bottlenose dolphin

1. The Navy will avoid exposing an area within 1 km (0.5 NM) of shore to high intensity active sonar and in-water explosives. Avoidance will include a 4 km area around the area 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). For in-water explosives, avoidance means prohibiting all in-water explosives in Bins E-6 thru E-13:

The above was also included as a condition from the California Coastal Commission in response to the Navy's consistency Determination for CZMA, based on input to the Commission by other organizations. The California Coast stock of bottlenose dolphin, between 400 and 500 individuals, forages and transits within 1 km (0.5 NM) from the shoreline along the mainland coast of California and Baja Mexico (Marin County California to Ensenada, Mexico). NMFS' latest stock assessment report for the 2017 reporting year suggests the population may be growing, including slight range expansion north, and with low annual mortality from civilian sources such as fishery interactions. Further, there are no known Navy caused deaths or injuries to this stock. Base on acoustic impact modeling in the HSTT EIS/OEIS, the Navy does not predict any mortality or significant injury (lung injury, PTS) to this stock from explosives, nor would their very near shore distribution expose them to high levels of sonar.

The coastal range of this dolphin species would only interact with Navy training and testing activities in the nearshore waters of Camp Pendleton (mostly small boat maneuvering), and within a very limited subset of Navy small boat and unmanned underwater vehicle mine warfare activities in the Silver Strand Training Complex off of San Diego (see Figures 2.2-9 and 2.1-10). Limited water depth where these dolphins typically transit at these locations (surface zone to < 0.5 nautical miles) precludes approach by larger Navy vessels, such as surface ships with the more powerful sonar systems. The remainder of the stock's range between Point Loma and the southern boundary of Camp Pendleton and from the northern boundary of Camp Pendleton to the northern boundary of the HSTT Study Area where water depth would allow large vessel access, are often bounded on the seaward side with extensive kelp beds through which Navy vessels would not cross. In addition, the areas are frequently used for civilian recreational use (e.g., pleasure boating, commercial and recreational fishing, paddleboarding and kayaking, swimming). Therefore, the probability for Navy activities using surface ship hull-mounted mid-frequency active sonar, explosives, or vessel movement to occur in the areas outside Camp Pendleton and the Silver Strand portions of coastal bottlenose dolphin range is so low as to be discountable.

The California Coast stock of bottlenose dolphins does not appear to be in peril from any human factors, including civilian and Navy coastal activities. Navy does not predict any significant effects to this stock in the HSTT EIS/OEIS (see Table 3.7-29) since Navy activities do not overlap with areas where California Coast stock of bottlenose dolphins are likely to occur throughout most of its range. Finally, the actual overlap between the stock and Navy small boat and mine warfare activities near Camp Pendleton and the Silver Strand Training Complex represents only a small fraction of the species total home range between central California and Baja Mexico. Therefore, additional geographic mitigations are unwarranted. The Navy already has existing mitigations in place as discussed in Chapter 5 (Mitigation) that are based on activity specific conditions. These include the use of lookouts and observers before, during, and after an event; protective mitigation ranges where events can be paused while marine

mammals transit; and standoff distances where practical. These measures are designed to be protective for all marine mammal species, including the California Coast stock of bottlenose dolphins.

2. Vessel Speed Restrictions within the 1 km (0.5 NM) from shore coastal area

As discussed above for other areas for placing speed restrictions (e.g., Santa Barbara Island and San Diego Arc, on Navy activities), there are important differences between most Navy vessels and their operation compared to commercial ships that individually make Navy vessels much less likely to strike a whale. Dolphins and pinnipeds, the only potential species in this near shore area, in general are rarely struck by vessels or boats of any type. As mentioned above, only small Navy boats typically operate within this coastal area, which are then unlikely to encounter a marine mammal. The Navy already has successful existing mitigation and protective measures to avoid vessel interactions with marine mammals and operate at safe speeds, therefore, implementing vessel speed restrictions on naval vessels would not be biologically effective at mitigating adverse impacts to marine mammals in the 1 km coastal area or be practical to implement.

K.2.2.4.2 Hawaii Range Complex portion of the HSTT Study Area

West-side Hawaii Island Planning Awareness Area (as proposed in the DEIS/OEIS)

As discussed in Section K.2.2 (Mitigation Areas to be Implemented), the Navy has combined and renamed the West-side and East-side Hawaii Island Planning Awareness Areas and Cautionary Areas as the Hawaii Island Mitigation Area. The Navy provided a complete analysis for multiple marine mammal species that occur within the previously named West-side Hawaii Planning Awareness and Cautionary Areas (see Section K.3, Biologically Important Areas within the Hawaii Range Complex Portion of the HSTT Study Area). With that analysis, the Navy has determined that it would be operationally practical to mitigate potential adverse impacts in this biologically important area by establishing a cap on some sonar hours (the most potentially impactful sources, such as surface ship hull-mounted active sonar [MF1] and dipping sonar [MF4]) in a geographically expanded Hawaii Island Mitigation Area. This will still retain necessary flexibility in the Navy's planning process while advancing the Navy's commitment to reducing the potential for adverse impacts to all species present in the mitigation area. The expanded Hawaii Island Mitigation Area is described above in Section K.2.2 (Mitigation Areas to be Implemented).

1. Limit major training exercises to reduce cumulative exposure:

The Navy's cumulative impact assessment in Chapter 4 (Cumulative Impacts), the Navy's quantitative analysis using the best available science in Chapter 3.7 (Marine Mammals), and the findings from research and monitoring and the regulatory conclusions from previous analyses by NMFS, have determined that impacts from Navy training and testing activities are not expected to have long-term consequences to populations of marine mammals. In addition, the Navy has proposed to limit the amount of surface ship hull-mounted mid-frequency sonar (MF1), air-deployed mid-frequency sonar (MF-4), and explosives within the entire Hawaii Island Mitigation Area, including Alenuihaha Channel, where the mitigation area overlaps with small and resident biologically important areas for multiple species, especially for those of concern.

Based on the Navy's operational assessment in Section K.3 (Mitigation Assessment of the Hawaii Range Complex portion of the HSTT Study Area), prohibiting major training exercises or spatially separating them within the Hawaii Island Mitigation Area was proposed as additional mitigation to ensure that "marine mammal populations with highly discrete site fidelity…are not exposed to multiple major training exercises within a single year, "specifically to the Hawaii Island Melon-Headed Whale Small and

Resident Population. While the Navy does conduct some portions of major training exercises (e.g., Rim of the Pacific, Undersea Warfare training, and Independent Deployer Certification training) in the Hawaii Island Mitigation Area, the majority of the training using mid-frequency active sonar is conducted further offshore (>32 NM) in the Warning Area (W-194) to the west of Hawaii Island. Segmenting portions of these exercises (e.g., amphibious assault or strait transit training) to other areas in the Hawaii OPAREAs further from the Pohakuloa Training Area Range and the Alenuihaha Channel over time and space would result in an unacceptable loss of training realism, degrade the training and would erode strike group readiness.

The concern raised was that "… a single catastrophic event along the west side of the Big Island could easily cause population-level impacts" ignores the fact the Navy has been training and testing in Hawaii for decades, including conducting major training exercises in the mitigation area, and long term and relatively comprehensive research has found no evidence of any apparent effects while documenting the continued existence of multiple small and resident populations of various species as well as long term residency by individuals. There is no evidence to suggest there have been any population level effects in the HSTT Study Area resulting from ongoing training and testing activities.

As discussed in the EIS/OEIS, Section 3.7.3.1 (Acoustic Stressors) and in Section K.3.6 (Hawaii Island Melon-Headed Whales Small and Resident Population Area), melon-headed whale reactions to sonar are most likely short-term and mild to moderate, and significant impacts on the small and resident population of melon-headed whale are unlikely to occur. Only 7 percent of the annual modeled takes and 13 percent of the testing takes, from all sonar sources, are associated with the Kohala population under the Preferred Alternative (see Figure 3.7-54 and Table 3.7-55, and Appendix E (Estimated Marine Mammal and Sea Turtle Impacts from Exposure to Acoustic and Explosive Stressors Under Navy Training and Testing Activities). This translates to approximately 8–9 TTS and 220 behavioral responses, annually. However, as described in Section 3.7.3.1 (Acoustic Stressors) and in more detail below, the stressor analysis did not take into consideration the Navy does not routinely conduct more intense activities such as anti-submarine warfare training or major training exercises within the small and resident population area, nor does it take into account the proposed limits on the use of MF1 and MF4 sources within the mitigation area, or that the Navy's modeling is conservative and likely over-predictive where behavioral effects are based on precautionary criteria and thresholds. While the small and resident population of melon-headed whales could still be exposed to sound from sonar from more than a few kilometers away, most exposures would only result in short-term behavioral impacts.

The biologically important area for this small and resident population is only a small, shallow, nearshore portion of the larger mitigation area. Reviewing recent sonar data, surface ship hull-mounted mid-frequency active sonar is used extremely rarely in the biologically important area, and dipping sonar is only used rarely where the biologically important area extends into Alenuihaha Channel. Sonar is used more frequently however, in deeper waters of the mitigation area that are outside the shallow biologically important area. As described throughout this appendix (for example, see Section K.3.11.2 [Hawaii Island Cuvier's Beaked Whale Small and Resident Population Area), both the Alenuihaha Channel and the waters west of Kawaihae Harbor are vital for a broad spectrum of naval and amphibious training which cannot be completed elsewhere in the Hawaii Range Complex. The Navy cannot prohibit all major training exercises or be relocated in the mitigation area because some activities are specifically located to leverage particular features like the Alenuihaha channel or the approaches to Kawaihae Harbor and the air-to-ground range at Pohakuloa Training Area.

Given these operational challenges, the Navy determined that it would be more operationally practical to mitigate adverse impacts in this habitat area by establishing a cap on sonar hours for the most impactful surface ship hull-mounted mid-frequency active sonar sources (MF1 and MF4) in a geographically expanded Hawaii Island Mitigation Area, rather than to prohibit or further limit the number of major training exercises or to spatially rotate major training exercises. This will retain necessary flexibility in the Navy's planning process while demonstrating the Navy's commitment to further reducing the potential for adverse impacts to all species present in the Hawaii Island Mitigation Area.

2. Prohibit use of air-deployed mid-frequency active sonar:

A year-round prohibition on air-deployed mid-frequency active sonar was proposed as additional mitigation because "dipping sonar has been shown to have a disproportionate impact… on beaked whales and may impact other species in a similar manner". This concern is based on the information presented in Falcone et al. (2017). This study does provide some evidence that reinforces the conclusion that contextual factors, besides the level of sound received by the animal, play a strong role in mediating the observed behavioral responses. The Navy's technical report *Criteria and Thresholds for U.S. Navy Acoustic and Explosive Effects Analysis (Phase III)* (U.S. Department of the Navy, 2017a) is available on the project website (www.hstteis.com) and provides details on the derivation of the Navy's current behavioral response functions for beaked whales and other marine mammal groups. The report specifically addresses contextual factors such as proximity (i.e., the distance between the sound source and the marine mammal) which is incorporated into the Navy's quantitative analysis for estimating the numbers of potential behavioral impacts. Falcone et al. (2017) is discussed and considered in the HSTT Final EIS/OEIS, but is not incorporated directly into the Navy's Phase III behavioral response functions because: 1) the Navy's current Behavioral Response Functions were developed and agreed upon with NMFS in 2016; and 2) the Falcone et al. (2017) research lacks paired received level and behavioral response observations necessary as inputs to developing or refining behavioral response functions. However, the Navy's current Phase III behavioral response functions would have predicted behavioral response in beaked whales at the distances observed in the Falcone et al. (2017) research due to exposure to anti-submarine warfare helicopter dipping sonar.

The potential effects of dipping sonar have been rigorously accounted for in the Navy's analysis. Parameters such as power level and propagation range for typical dipping sonar use are factored into HSTT acoustic impact analysis along with guild specific criteria and other modeling variables, as detailed in the EIS/OEIS and technical report. Furthermore, due to the lower power settings of dipping sonar, potential impact ranges of dipping sonar are significantly lower than surface ship sonars. For example, the HSTT average modeled range to TTS of dipping sonar for a one-second ping on low-frequency cetaceans (i.e., blue whale) is 77 m, and for mid-frequency cetaceans including beaked whales is 22 m (see EIS/OEIS Table 3.7-7). This range is easily monitored for marine mammals by a hovering helicopter and is accounted for in the Navy's proposed mitigation ranges for dipping sonars (200 yd. or 183 m). Limited ping time (i.e., less dipping sonar use as compared to typical surface ship sonar use) and lower power settings would also limit the impact from dipping sonar to any marine mammal species. The Navy will continue to work with researchers in the future and further refine its approach to assessing impacts to marine species as new data becomes available, but no new research to date, including the Falcone et al. (2017) study, would change the results of the marine mammal impact analysis or the conclusions reached in the HSTT DEIS/OEIS.

Of particular importance, behavioral responses of beaked whales from dipping and other sonars cannot be universally applied to other marine mammal species. Research indicates that there are distinct individual variations as well as strong behavioral state considerations that influence any response or lack of response (Goldbogen et al., 2013a; Harris et al., 2018). Therefore, it is expected that other species would have highly variable individual responses ranging from some response to no response to any anthropogenic sound. This variability is accounted for in the Navy's current behavioral response curves described in the EIS/OEIS and technical report.

As described above, both the Alenuihaha Channel and the waters west of Kawaihae Harbor are vital for a broad spectrum of naval and amphibious training which cannot be completed elsewhere within the Hawaii Range Complex. It would not be operationally practical to prohibit all dipping sonar in the mitigation area, which would preclude the full-spectrum of anti-submarine training and testing. The use of all anti-submarine capabilities during training and testing events in the Alenuihaha Channel is critical to the development of effective readiness of Naval forces for deployment across the globe, including strategic maritime choke points that are vital to the national security of the United States. Naval forces must be able to leverage all anti-submarine capabilities during training in the Alenuihaha Channel so that operational forces train in maritime environments similar to those in which they will be required to conduct military operations. While air-deployed mid-frequency active sonar is already addressed in the Navy's impact modeling and includes procedural mitigation specifically for this source (see Chapter 5, Mitigation), the Navy determined that it would be operationally practical to further mitigate potential adverse impacts in beaked whale habitat area. The Navy further acknowledges that beaked whales are particularly sensitive to sound by establishing a cap on dipping sonar hours (MF4) in a geographically expanded Hawaii Island Mitigation Area. This will retain necessary flexibility in the Navy's planning process while advancing the Navy's commitment to further reducing the potential for adverse impacts to all species present in the Hawaii Island Mitigation Area, which is described above in Section K.2.2 (Mitigation Areas to be Implemented).

3. Prohibit other sources of mid-frequency active sonar.

Training and testing with active sonar is essential to national security because active sonar is the only reliable technology for detecting and tracking diesel-electric submarines. Prohibiting mid-frequency active sonar as additional mitigation beyond what the Navy can implement as described in K.2.2 (Mitigation Areas to be Implemented) would not allow the Navy to achieve satisfactory levels of readiness required to meet the purpose and need of the Proposed Action. The Navy uses active sonar only when it is essential to a training mission or testing program requirement, since active sonar can alert opposing forces to the operating platform's presence. Passive sonar and other available sensors are used in concert with active sonar to the maximum extent practical. The ability to effectively use mid-frequency active sonar is a highly perishable skill that must be repeatedly practiced under realistic conditions. As described throughout this appendix, the operating areas west of Hawaii are vital for a broad spectrum of naval and amphibious training. Prohibiting all sources of mid-frequency active sonar in the Hawaii Island Mitigation Area would not be practical to implement because Naval forces would be unable to deploy to support operational Commanders' requirements due to a lack of sufficient training. However, the Navy has determined that it would be operationally practical to further mitigate potential adverse impacts in this habitat area by establishing a cap on some sonar hours (the more impactful sources, [e.g., sonar bins MF1 and MF4]) in a geographically expanded Hawaii Island Mitigation Area. This will retain necessary flexibility in the Navy's planning process while advancing the Navy's

commitment to further reducing the potential for adverse impacts to all species present in the Hawaii Island Mitigation Area as described above in Section K.2.2 (Mitigation Areas to be Implemented).

East-Side Hawaii Island Cautionary Area (as proposed in the DEIS/EIS)

The Navy provided a complete analysis for multiple marine mammal species that occur within the previously named East-side Hawaii Cautionary Area (see Section K.3, Biologically Important Areas Within the Hawaii Range Complex Portion of the HSTT Study Area). As noted in Section K.2.2 (Mitigation Areas to be Implemented), the Navy has combined and renamed the East-side and West-side Planning Awareness and Cautionary Areas as one mitigation area: Hawaii Island Mitigation Area. With that analysis, the Navy has determined that it would be operationally practical to mitigate potential adverse impacts in this biologically important area by establishing a cap on some sonar hours (the most potentially impactful sources being surface ship hull-mounted active sonar [MF1] and dipping sonar [MF4]) in a geographically expanded Hawaii Island Mitigation Area. This will still retain necessary flexibility in the Navy's planning process while advancing the Navy's commitment to reducing the potential for adverse impacts to all species present in the mitigation area. The expanded Hawaii Island Mitigation Area is described above in Section K.2.2 (Mitigation Areas to be Implemented).

1. Prohibit use of air-deployed mid-frequency active sonar:

As discussed above for the West-side Hawaii Island Planning Awareness Area (Hawaii Island Mitigation Area, year-round prohibition on air-deployed mid-frequency active sonar was proposed as additional mitigation because "dipping sonar has been shown to have a disproportionate impact…on beaked whales and may impact other species in a similar manner." This concern is based on the information presented in Falcone et al. (2017). As discussed earlier, this study does provide some evidence that reinforces the conclusion that contextual factors, besides the level of sound received by the animal, play a strong role in mediating the observed behavioral responses. The Navy's technical report *Criteria and Thresholds for U.S. Navy Acoustic and Explosive Effects Analysis (Phase III)* (U.S. Department of the Navy, 2017a) is available on the project website (www.hstteis.com) and provides details on the derivation of the Navy's current behavioral response functions for beaked whales and other marine mammal groups. The report specifically addresses contextual factors such as proximity (i.e., the distance between the sound source and the marine mammal) which is incorporated into the Navy's quantitative analysis for estimating the numbers of potential behavioral impacts. Falcone et al. (2017) is discussed and considered in the EIS/OEIS, but is not incorporated directly into the Navy's Phase III behavioral response functions because (1) the Navy's current Behavioral Response Functions were developed and agreed upon with NMFS in 2016, and (2) the Falcone et al. (2017) research lacks paired received level and behavioral response observations necessary as inputs to developing or refining behavioral response functions. However, the Navy's current Phase III behavioral response functions would have predicted behavioral response in beaked whales at the distances observed in the Falcone et al. (2017) research due to exposure to anti-submarine warfare helicopter dipping sonar.

The potential effects of dipping sonar have been accounted for in the Navy's analysis. Parameters such as power level and propagation range for typical dipping sonar use are factored into HSTT acoustic impact analysis along with guild specific criteria and other modeling variables, as detailed in the EIS/OEIS and technical report. Furthermore, due to the lower power settings of dipping sonar, potential impact ranges of dipping sonar are significantly lower than surface ship sonars. For example, the HSTT average modeled range to TTS of dipping sonar for a one-second ping on low-frequency cetaceans (e.g., blue whale) is 77 m, and for mid-frequency cetaceans including beaked whales is 22 m (see EIS/OEIS Table

3.7-7). This range is easily monitored for marine mammals by a hovering helicopter and is accounted for in the Navy's proposed mitigation ranges for dipping sonars (200 yd. or 183 m). Limited ping time (i.e., less dipping sonar use as compared to typical surface ship sonar use) and lower power settings would also limit the impact from dipping sonar to any marine mammal species. The Navy will continue to work with researchers in the future and further refine its approach to assessing impacts to marine species as new data becomes available, but no new research to date, including the Falcone et al. (2017) study, would change the results of the marine mammal impact analysis or the conclusions reached in the HSTT DEIS/OEIS.

It would not be operationally practical to prohibit all dipping sonar in the mitigation area, because it would preclude the inclusion of the full-spectrum of anti-submarine training and testing in areas where it overlaps with the Alenuihaha Channel. The use of all anti-submarine capabilities during training and testing events in the Alenuihaha Channel is critical to the development of effective readiness of Naval forces for deployment across the globe, including to strategic maritime choke points that are vital to the national security of the United States. Naval forces must be able to leverage all anti-submarine capabilities during training in the Alenuihaha Channel so that operational forces train in maritime environments similar to those in which they will be required to conduct military operations.

While air-deployed mid-frequency active sonar is addressed in the Navy's impact modeling and includes procedural mitigation for this source (see Chapter 5, Mitigation), the Navy determined that it would be operationally practical to further mitigate potential adverse impacts in beaked whale habitat by establishing a cap on dipping sonar hours (MF4) used in a geographically expanded Hawaii Island Mitigation Area. This will retain necessary flexibility in the Navy's planning process while advancing the Navy's commitment to further reducing the potential for adverse impacts to all species present in the Hawaii Island Mitigation Area as described above in Section K.2.2 (Mitigation Areas to be Implemented).

2. Prohibit other sources of mid-frequency active sonar:

Training and testing with active sonar is essential to national security because active sonar is the only reliable technology for detecting and tracking enemy diesel-electric submarines. Prohibiting all mid-frequency active sonar as additional mitigation beyond what the Navy will implement as described in Section 5.3 (Procedural Mitigation to be Implemented) and Section K.2.2 (Mitigation Areas to be Implemented), would not allow the Navy to achieve satisfactory levels of readiness required to meet the purpose and need of the Proposed Action. The Navy uses active sonar only when it is essential to a training mission or testing program requirement since active sonar has the potential to alert opposing forces to the operating platform's presence. Passive sonar and other available sensors are used in concert with active sonar when practical. The ability to effectively use mid-frequency active sonar is a highly perishable skill that must be repeatedly practiced under realistic conditions. Sonar is used regularly for training and testing in the deep waters of the southeast portion of this mitigation area, generally outside most biologically important areas, where the island slope flattens out into the abyssal plain. Prohibiting all sources of mid-frequency active sonar in the Hawaii Island Mitigation Area would not be practical to implement. The Navy has determined however that it may be biologically effective as well as operationally practical to further mitigate potential adverse impacts in this habitat area by establishing a cap on some sonar hours (the more potentially impactful sources, [e.g., sonar bins MF1 and MF4]) in a geographically expanded Hawaii Island Mitigation Area. This will retain necessary flexibility in the Navy's planning process while advancing the Navy's commitment to reduce the potential for adverse impacts to all species present in the Hawaii Island Mitigation Area. The expanded Hawaii Island Mitigation Area is described above in Section K.2.2 (Mitigation Areas to be Implemented).

Humpback Whale Cautionary Area (as proposed in the DEIS/OEIS)

The Navy provided a complete analysis for humpback whales in the Humpback Whale Cautionary Areas (see Section K.3.1 [Main Hawaiian Islands Humpback Whale Reproduction Area] and more specifically, Section K.3.1.6 [4-Islands Region and Penguin Bank Humpback Whale Reproduction Area, and Settlement Area 2-A and 2-B]) for more details). As discussed above in Section K.2.2 (Mitigation Areas to be Implemented), the Navy has renamed the Humpback Whale Cautionary Area to the 4-Islands Region Mitigation Area. Based on this analysis, the Navy will continue to restrict surface ship hull-mounted mid-frequency active sonar during training and testing in the mitigation area from November 15 through April 15. In addition, the Navy will restrict the use of explosives during training and testing in the 4-Islands Region Mitigation Area, year-round.

1. Extend the Humpback Whale Cautionary Area west to encompass the Humpback Whale Special Reporting Area in Kaiwi Channel. Extend restrictions to year-round in the Navy-proposed extended portion of the Humpback Whale Cautionary Area and the public-proposed extension into the Kaiwi Channel Humpback Whale Special Reporting Area:

This recommendation was proposed to reduce the risk of "population-level consequences [due to] cumulative disturbance and habitat displacement" for the main Hawaiian Island insular false killer whale (*Pseudorca crassidens*) population since the Navy's proposed mitigation area overlaps a portion of the designated biologically important area and areas designated as critical habitat for the main Hawaiian Island insular false killer whale. Critical habitat for the main Hawaiian Island insular false killer whale was designated by NMFS on July 24, 2018. The recommendation is to extend the Navy's mitigation area into the existing special reporting area for humpback whales (see Section K.1.1.5, Mitigation Areas Currently Implemented, for more information), which includes a portion of Kaiwi Channel, also known as Penguin Bank, to afford added protection for the main Hawaiian Island insular false killer whale. Penguin Bank overlaps critical habitat for this species, which also includes the entire main Hawaiian Islands from Niihau east to Hawaii, from the 45-meter depth contour to the 3,200-meter depth contour, with the exception of 14 excluded areas. Some of these excluded areas were requested by the Navy as areas of strategic importance for training and testing.

The portion of the special reporting area that extends into Kaiwi channel over Penguin Bank (equivalent to Settlement Area 2-A) is generally not a higher use area for the main Hawaiian Island insular false killer whale because of its relatively shallow depth and does not overlap significantly with the main Hawaiian Island insular false killer whale biologically important area (see Figure K.3-4). As presented in the EIS/OEIS (see Figure 3.7-46 and Table 3.7-31), the Navy's quantitative analysis indicates that significant impacts on false killer whale natural behaviors or abandonment due to training with sonar and other transducers are unlikely to occur within the entire small and resident population area, let alone in the small sub-portions of the biologically important area that overlaps the proposed extension. Additionally, most of the modeled takes are for the Hawaii Pelagic population of false killer whale (see Figure 3.7-46 and Table 3.7-31). As described in Section K.3.3 (False Killer Whale Small and Resident Population Area: Main Hawaiian Island Insular Stock), tagging data has not shown that this species has an observable behavioral response to Navy mid-frequency active sonar

Only very small corners of the biologically important area overlap with the proposed area. Main Hawaiian Island insular false killer whales are known to move widely and quickly among the main Hawaiian Islands (Baird et al., 2010b; Oleson et al., 2010) and therefore cumulative disturbance and habitat displacement occurring in this small area is not anticipated. This expansion is not expected to reduce adverse impacts to an extent that would outweigh the negative impacts if unit commanders

were unable to conduct unit-level training and testing, especially as they transit between Pearl Harbor and the larger Study Area.

Extending the mitigation area seasonal mid-frequency active sonar restrictions to year-round is not operationally practical, as it would preclude the Submarine Command Course from meeting its objectives and leveraging the important and unique characteristics of the 4-Islands Region. Penguin Bank in particular is used for shallow water submarine testing and anti-submarine warfare training because of its large expanse of shallow bathymetry. Please see Section K.3.1.6.1 (Navy Requirements for Area-Specific Training and Testing) for more details on the operational assessment for the 4-Islands Region and its strategic importance to the Navy for training and testing.

Additionally, this mitigation would further increase reporting requirements. As discussed in Section 5.5.7 (Reporting Requirements), the Navy developed its reporting requirements in conjunction with NMFS and consistent with mission requirements, balancing the usefulness of the information to be collected with the practicality of collecting it. An increase in reporting requirements as mitigation would draw the event participants' attentions away from the complex tactical tasks they are primarily obligated to perform (such as driving a warship or engaging in a gunnery activity), which would adversely impact personnel safety, public health and safety, and the effectiveness of the military readiness activity. In fact, in its most recent Comprehensive Review of Recent Surface Force Incidents, which looked at various incidents in the 7th Fleet, the Navy found that creating additional administrative burdens on operational Commanders distracts them from preparing a ready force.

Expanding the mitigation area and extending the protections year round are not expected to further reduce adverse impacts on either main Hawaiian Island insular false killer whales or humpback whales (present only a portion of the year) and therefore do not meet the Navy's criteria for geographic mitigation of being biologically effective as discussed above in Section K.2.1.2 (Biological Effectiveness Assessment) nor is it practicable to implement as discussed in Section K.2.1.3 (Operational Assessment).

2. Implement vessel speed restrictions within the Humpback Whale Cautionary Area:

This mitigation measure was proposed to mitigate impacts on humpback whales due to both ship noise and ship strikes. As discussed in Section K.1.1.1 (Awareness Notification Messages), the Navy is proposing to continue to issue awareness notification messages seasonally to alert ships and aircraft to the possible presence of concentrations of humpback whales in the Hawaii Range Complex portion of the Study Area.

As discussed above for the San Diego Arc, analysis of Navy ship traffic in the HSTT Study Area between 2011 and 2015, median speed of all Navy vessels within Hawaii is typically already low, with median speeds between 8 and 16 knots (Mintz, 2016). Speed restrictions specifically in the mitigation area are unwarranted given the movement of all marine mammal social groups throughout the islands, the already safe training and testing ship speeds Navy uses within the HSTT Study Area, and existing Navy mitigation measures including provisions to avoid large whales by 500 yards where safe to do so, as described in Chapter 5 (Mitigation). For a more detailed discussion, please see above for the San Diego Arc on vessel speed restrictions and the impracticality of implementation.

In order to maintain safety of navigation and to avoid interactions during transit, vessels will be instructed to remain vigilant to the presence of humpback whales throughout the Hawaii Range Complex, that when concentrated seasonally, may become vulnerable to vessel strikes. Providing Lookouts additional information about the possible presence of concentrations of large whales in certain locations seasonally will assist the Navy to further avoid interactions with these animals during

vessel transits and when training and testing activities are conducted in these areas. The Navy reports all whale strikes within the Study Area, should one occur.

3. Prohibit use of air-deployed mid-frequency active sonar:

A year-round prohibition on air-deployed mid-frequency active sonar within areas that overlap with the humpback whale and false killer whale biologically important areas, and within the original boundaries of the original Humpback Whale Cautionary Area, was proposed as additional mitigation because "dipping sonar has been shown to have a disproportionate impact… on beaked whales and may impact other species in a similar manner."

This concern is based on the information presented in Falcone et al. (2017). The recommendation to prohibit air-deployed mid-frequency active sonar is based on this recent study on behavioral responses to these sources from beaked whales and appears to translate those same behavioral responses should apply to other species, such as humpback whales and false killer whales. Of particular importance, behavioral responses of beaked whales from dipping and other sonars cannot be universally applied to these or other marine mammal species. Research indicates that there are distinct individual variations as well as strong behavioral state considerations that influence any response or lack of response (Goldbogen et al., 2013b; Harris et al., 2018). Therefore, it is expected that other species would have highly variable individual responses ranging from some response to no response to any anthropogenic sound. This variability is accounted for in the Navy's current behavioral response curves described in the EIS/OEIS and supporting technical reports.

Falcone et al. (2017) does provide some evidence that reinforces the conclusion that contextual factors, besides the level of sound received by the animal, play a strong role in mediating the observed behavioral responses. The Navy's technical report *Criteria and Thresholds for U.S. Navy Acoustic and Explosive Effects Analysis (Phase III)* (U.S. Department of the Navy, 2017a) is available on the project website (www.hstteis.com) and provides details on the derivation of the Navy's current behavioral response functions for beaked whales and other marine mammal groups. The report specifically addresses contextual factors such as proximity (i.e., the distance between the sound source and the marine mammal) which is incorporated into the Navy's quantitative analysis for estimating the numbers of potential behavioral impacts. Falcone et al. (2017) is discussed and considered in the HSTT Final EIS/OEIS, but is not incorporated directly into the Navy's Phase III behavioral response functions because: 1) the Navy's current Behavioral Response Functions were developed and agreed upon with NMFS in 2016; and 2) the Falcone et al. (2017) research lacks paired received level and behavioral response observations necessary as inputs to developing or refining behavioral response functions. However, the Navy's current Phase III behavioral response functions would have predicted behavioral response in beaked whales at the distances observed in the (Falcone et al., 2017) research due to exposure to anti-submarine warfare helicopter dipping sonar.

The potential effects of dipping sonar have been rigorously accounted for in the Navy's analysis. Parameters such as power level and propagation range for typical dipping sonar use are factored into HSTT acoustic impact analysis along with guild specific criteria and other modeling variables, as detailed in the EIS/OEIS and technical report. Furthermore, due to the lower power settings of dipping sonar, potential impact ranges of dipping sonar are significantly lower than surface ship sonars. For example, the HSTT average modeled range to TTS of dipping sonar for a 1-second ping on low-frequency cetaceans (i.e., blue whale) is 77 m, and for mid-frequency cetaceans including beaked whales is 22 m (see EIS/OEIS Table 3.7-7). This range is easily monitored for marine mammals by a hovering helicopter

and is accounted for in the Navy's proposed mitigation ranges for dipping sonars (200 yd. or 183 m). Limited ping time (i.e., less dipping sonar use as compared to typical surface ship sonar use) and lower power settings would also limit the impact from dipping sonar to any marine mammal species. The Navy will continue to work with researchers in the future and further refine its approach to assessing impacts to marine species as new data becomes available, but no new research to date, including the Falcone et al. (2017) study, would change the results of the marine mammal impact analysis or the conclusions reached in the HSTT DEIS/OEIS.

This is an area of extremely low use for air-deployed mid-frequency active sonar. Prohibiting air-deployed mid-frequency active sonar in the mitigation area would not be any more protective to marine mammal populations generally, or humpback or main Hawaiian Islands insular false killer whales in particular, than currently implemented procedural mitigation measures for air-deployed mid-frequency active sonar (see Chapter 5, Mitigation) and does not meet the Navy's criteria discussed in Section K.2.1.2 (Biological Effectiveness Assessment) for being biologically effective.

4. Prohibit use of low-frequency active sonar:

This prohibition was proposed because "baleen whales are vulnerable to the impacts of low-frequency active sonar, particularly in calving areas where low-amplitude communication calls between mothers and calves can be easily masked."

The Navy recognizes the importance of this area for humpback whales (a baleen whale species) during the calving season. However, as discussed in Section 3.7.3.1.1.5 (Behavioral Reactions), studies found only short-term responses to low-frequency sound by some fin and humpback whales, including changes in vocal activity and avoidance of the source vessel, while other fin, humpback, and blue whales did not respond at all (Clark & Fristrup, 2001; Croll et al., 2001; Fristrup et al., 2003; Miller et al., 2000; Nowacek et al., 2007). And, as described in Section 3.7.2.3.1 (Humpback Whale [*Megaptera novaeangliae*], Hawaii Distinct Population Segment), the best available science has demonstrated humpback whale populations in Hawaii and estimated abundance are greater than some pre-whaling estimates. The Hawaii population was delisted under ESA in 2016 due to recovery of this population, indicating there are no population-level impacts from decades of similar and ongoing Navy training and testing in the Hawaiian Islands.

Placing restrictions on the use of low-frequency active sonar would have a significant impact on the testing of current systems and the development of new systems. This would deny research, testing, and development program managers the flexibility to rapidly field or develop necessary systems due to the required use of the area. Therefore, implementing additional mitigation areas beyond what is described in Section K.2.2 (Mitigation Areas to be Implemented) would be impractical to implement and would not be expected to be particularly biologically effective in reducing adverse impacts to humpback whales. Therefore, the proposed additional mitigation does not meet the Navy's criteria as discussed above in Section K.2.1.2 (Biological Effectiveness Assessment) and Section K.2.1.3 (Operational Assessment).

Alenuihaha Channel

The Navy provided a complete analysis for multiple marine mammal species that occur within the Alenuihaha Channel (see Section K.3 [Biologically Important Areas within the Hawaii Range Complex Portion of the HSTT Study Area]). With that analysis, the Navy has determined that it would be operationally practical to mitigate potential adverse impacts in this biologically important area by establishing a cap on sonar hours for the most potentially impactful sources (surface ship hull-mounted active sonar [MF1] and dipping sonar [MF4]) in a geographically expanded Hawaii Island Mitigation Area.

This will still retain necessary flexibility in the Navy's planning process while advancing the Navy's commitment to reducing the potential for adverse impacts to all species present in the mitigation area. The expanded Hawaii Island Mitigation Area is described above in Section K.2.2 (Mitigation Areas to be Implemented).

1. Continue to implement the mitigation measures set forth in the Settlement Agreement for the Alenuihaha Channel and prohibit or restrict the use of air-deployed mid-frequency active sonar and all other sources of mid-frequency active sonar used in major training exercises and by navy units (e.g., in unit-level training and in maintenance and system checks while in transit) in this area:

The additional mitigation was proposed because "a number of vulnerable species…reside in and use this vulnerable area year-round." As discussed earlier, the provisional temporary prohibitions and restrictions on activities within the HSTT Study Area were derived pursuant to negotiations with plaintiffs and were specifically not evaluated or selected based on the type of thorough examination of best available science that occurs through the consultation process under the MMPA, or through analysis conducted for NEPA purposes. The agreement did not constitute a concession by the Navy as to the potential impacts of Navy activities on marine mammals or any other marine species, nor a concession by the Navy as to the importance of these areas to marine species. The Navy's adoption of restrictions on its activities as part of a relatively short-term settlement does not mean that those restrictions are necessarily supported by the best available science or, practical to implement from a military readiness standpoint over the longer term.

The Navy has worked collaboratively with NMFS to develop procedural mitigation to be implemented throughout the HSTT Study Area, as well as using inputs from operational forces, the best available science discussed in Chapter 3 (Affected Environment and Environmental Consequences), published literature, predicted activity impact footprints, and marine species monitoring and density data, in the assessment of mitigation areas (see Section K.2 [Mitigation Assessment]). The Navy completed an extensive biological effectiveness assessment and operational assessment (based on a detailed and lengthy review by training experts and leadership responsible for meeting readiness requirements) of potential mitigation areas throughout the entire Study Area, including the 2015 Settlement Areas where they overlap species specific biologically important areas identified in Baird et al. (2015b); Calambokidis et al. (2015); and Van Parijs et al. (2015a) (see Section K.1.1.1, Biologically Important Areas). The mitigation identified in Section 5.4 (Mitigation Areas to be Implemented) and K.2.2 (Mitigation Areas to be Implemented) represents the maximum mitigation within the identified mitigation areas that is practicable to implement under the Proposed Action.

As reiterated throughout the many species-specific analyses presented in Section K.3 (Biologically Important Areas Within the Hawaii Range Complex Portion of the HSTT Study Area), the Alenuihaha Channel has unique attributes for training and testing that do not exist elsewhere in the Hawaii Range Complex and is vital for a range of naval and amphibious training. The use of all anti-submarine capabilities during training and testing events in the Alenuihaha Channel is critical to the development of effective readiness of Naval forces for deployment across the globe, including strategic maritime choke points that are vital to the national security of the United States. Naval forces must be able to leverage all anti-submarine capabilities during training in the Alenuihaha Channel so that operational forces train in maritime environments similar to those in which they will be required to conduct military operations. Therefore, prohibiting all mid-frequency active sonar would not be practical to implement.

Northeast Kaiwi Channel

The Navy provided an analysis of multiple marine mammal species that occur within the Kaiwi Channel (see Section K.3, Biologically Important Areas within the Hawaii Range Complex Portion of the HSTT Study Area]). As discussed above in Section K.2.2 (Mitigation Areas to be Implemented), the Navy is proposing to implement two mitigation areas in Hawaii that overlap with areas designated as biologically important for main Hawaiian Islands insular false killer whale. See Section K.2.2 for details on the proposed Hawaii Island and 4-Islands Region Mitigation Areas.

1. Implement the mitigation measures set forth by the Settlement Agreement for the Northeast Kaiwi Channel and additionally, prohibit or restrict the use of surface-ship hull-mounted mid-frequency active sonar, air-deployed mid-frequency active sonar, and all other sources of mid-frequency active sonar (i.e., not hull-mounted or helicopter-deployed):

This additional mitigation was proposed because of the "conservation status of the insular false killer whale population". The provisional prohibitions and restrictions on activities within the HSTT Study Area were derived pursuant to negotiations with plaintiffs and were specifically not evaluated or selected based on the type of thorough examination of best available science that occurs through the consultation process under the MMPA, or through analysis conducted for NEPA purposes. The agreement did not constitute a concession by the Navy as to the potential impacts of Navy activities on marine mammals, or any other marine species. Furthermore, the Navy's adoption of restrictions on its activities as part of a relatively short-term settlement does not mean that those restrictions are supported by the best available science, are practical to implement from a military readiness standpoint over the longer term, or should necessarily be carried forward.

The Navy has worked collaboratively with NMFS to develop procedural mitigation to be implemented throughout the HSTT Study Area, as well as using inputs from the operational community, the best available science discussed in Chapter 3 (Affected Environment and Environmental Consequences), published literature, predicted activity impact footprints, and marine species monitoring and density data, in the assessment of mitigation areas of this appendix. The Navy completed an extensive biological effective assessment and operational assessment (based on a detailed and lengthy reviews by training experts and leadership responsible for meeting statutory readiness requirements) of potential mitigation areas throughout the entire Study Area, including the 2015 Settlement Areas where they overlap species specific biologically important areas identified in Baird et al. (2015a); Calambokidis et al. (2015); Van Parijs et al. (2015) (see Section K.1.1. (Biologically Important Areas). The mitigation identified in Section K.2.2 (Mitigation Areas to be Implemented) represents the maximum mitigation within areas that is practical to implement under the Proposed Action.

As described further in this appendix, the Kaiwi Channel is used to simulate strait transits and protecting high-value units within a channel environment for Navy vessels based in Pearl Harbor. This is an area where mid-frequency active sonar and anti-submarine warfare training occurs when ships are present in this area. Reviewing recent sonar data, this is a low use area for dipping and submarine sonar. Hull-mounted mid-frequency active sonar is generally only used while transiting through the channel, but it is still an area of relatively lower use when compared to other training and testing areas within the Study Area. While transiting the channel, any hull-mounted sonar engaged in anti-submarine warfare training would be moving at between 10 and 15 knots and nominally pinging every 50 seconds; therefore, the vessel will have traveled a minimum distance of approximately 257 m during the time between those pings (see Section 3.7.3.1.2.2, Impact Ranges for Sonar and Other Transducers). The range to TTS effects for a mid-frequency cetacean for 1 second of MF1 is 210 m, and therefore a false killer whale would

unlikely be exposed to multiple pings from a moving mid-frequency active sonar source that could result in an adverse impact, depending on the geometry of their relative motion. As described in Section 3.7.3.1.1.3 (Physiological Stress, odontocete behavioral responses to distant sources moving in variable directions appear to be driven by behavioral state, individual experience, or species-level sensitivities. Responses are more likely to be short-term, lasting the duration of the exposure or even shorter as the animal assesses the sound and (based on prior experience or contextual cues) determines a threat is unlikely.

As presented in the EIS/OEIS, Navy quantitative analysis indicates that significant impacts on false killer whale natural behaviors or abandonment due to training with sonar and other transducers are unlikely to occur within the entire small and resident population area, let alone in the small sub-portion of the biologically important area that overlaps the northeast Kaiwi Channel. Additionally, most of the modeled takes are for the Hawaii Pelagic population of false killer whale (see Figure 3.7-46 and Table 3.7-31). As described in Section K.3.3 (False Killer Whale Small and Resident Population Area: Main Hawaiian Island Insular Stock), tagging data has not shown that this species has an observable behavioral response to Navy mid-frequency active sonar.

Even though this is not a high use area for mid-frequency active sonar training and testing, it is important for units to be able to conduct unit-level training and testing as they transit through this thoroughfare between Pearl Harbor and other specific training and testing areas throughout the Study Area, in order to be able to participate in their scheduled events. Prohibiting all mid-frequency active sonar in the northeast Kaiwi Channel would not be practical to implement, nor is it expected to realistically reduce adverse impacts to main Hawaiian Islands insular false killer whale beyond the Navy's existing procedural and geographic mitigation measures. The Navy is aware that, based on the recent designation of critical habitat for the main Hawaiian Islands insular false killer whale, underwater sound is one of the essential features of the critical habitat necessary for the conservation and management of this stock. NMFS has designated critical habitat for the main Hawaiian Islands insular false killer whale distinct population segment by designating waters from the 45 m depth contour to the 3,200 m depth contour around the main Hawaiian Islands from Niihau east to Hawaii effective as of August 23, 2018 (83 FR 35062; Tuesday, July 24, 2018). Within these boundaries of the critical habitat NMFS excluded certain areas from designation under Section 4(b)(2) and 4(a)(3) of the ESA as shown in Figure 3.7 2.

The Navy is consulting with NMFS under section 7 of the ESA to ensure its activities are not likely to jeopardize this and other ESA-listed species or adversely affect designated critical habitat. Navy activities conducted within this discrete location are for brief periods, are less likely to have lasting effects on the overall characteristics of features essential to conservation, and are not expected to degrade the habitat and ultimately prevent insular false killer whales from benefitting from this habitat.

Cross Seamount

The Navy provided an analysis of the Cross Seamount in Section K.7.1.3 (Hawaii Public Comment Mitigation Area Assessment).

1. Designate a year-round management area to protect the seamount and consider habitat-based management measures for other nearby seamounts:

As discussed in K.7.1.3 (Hawaii Public Comment Mitigation Area Assessment), implementing new geographic based mitigation measures in addition to ongoing procedural mitigation measures within the vicinity of Cross Seamount does not meet the Navy's criteria of being biologically effective to the extent that it is balanced with the importance of these open ocean operating areas for training and testing (see

Section K.2.1.2 (Biological Effectiveness Assessment) and Section K.2.1.3 (Operational Assessment). Establishing a year-round management area would not be effective at reducing adverse impacts on beaked whales or other marine mammal populations nor would it be practicable to implement. The Navy has been training and testing in the broad ocean area around Cross Seamount with the same basic systems for over 40 years and there is no evidence of any adverse impacts having occurred. The broad ocean area around Cross Seamount and the seamounts to the north are unique in that there are no similar broad ocean areas in the vicinity of the Hawaiian Islands that are not otherwise encumbered by commercial vessel traffic and commercial air traffic routes.

Important habitat areas off Oahu, Kauai, and Niihau

The Navy provided an analysis of multiple marine mammal species that occur within important habitats off Oahu, Kauai, and Niihau (see Section K.3, Biologically Important Areas within the Hawaii Range Complex Portion of the HSTT Study Area). The recommendation below was based on areas offshore Oahu, Kauai, and Niihau designated as areas of biological importance to certain species, but are not included in the Navy's proposed mitigation areas, as discussed below and in Section K.3 of this Appendix.

1. Consider the implementation of Mitigation Areas off Oahu, Kauai, and Niihau. Providing mitigation measures for select activities during even a limited season within some important habitat areas could have value in reducing cumulative disturbance and stress in resident populations:

The Navy considers the biological effectiveness and operational practicality of geographic mitigation in identified habitat areas off Oahu, Kauai, and Niihau below in Section K.3 (Biologically Important Areas within the Hawaii Range Complex Portion of the HSTT Study Area). This includes the five identified biologically important areas off Oahu (false killer whale, humpback whale, pantropical spotted dolphin, bottlenose dolphin, and spinner dolphin) and three identified biologically important areas off Kauai and Niihau (humpback whale, spinner dolphin, and bottlenose dolphin) as well as additional mitigation in the 4-Islands Region Mitigation Area and the Humpback Whale Special Reporting Areas. In the EIS/OEIS, the Navy has presented research showing that in specific contexts such as urban noise, commercial vessel traffic, eco-tourism, or whale watching (see EIS/OEIS Section 3.7.2.1.5.2, Commercial Industries); (Dunlop, 2016; Dyndo et al., 2015; Erbe et al., 2014; Frisk, 2012; Gedamke et al., 2016; Heenehan et al., 2016a; Heenehan et al., 2016b; Heenehan et al., 2017a; Heenehan et al., 2017b; Hermannsen et al., 2014; Li et al., 2015; McKenna et al., 2012; Melcón et al., 2012; Miksis-Olds & Nichols, 2015; Nowacek et al., 2015; Pine et al., 2016; Pirotta et al., 2018; Tyne et al., 2014; Tyne, 2015; Tyne et al., 2015; Tyne et al., 2017; Williams et al., 2014), chronic repeated displacement and foraging disruption of populations with residency or high site fidelity can result in population-level effects. As also detailed in the EIS/OEIS, however, the Navy's proposed activities are not similar to the types of disturbances in the body of research above nor do they rise to the level of chronic disturbance where such effects have been demonstrated. There is no evidence to suggest there have been any population level effects in the waters around Oahu, Kauai, and Niihau, or in anywhere in the HSTT Study Area resulting from the same training and testing activities that have been ongoing for decades. In the waters around Oahu, Kauai, and Niihau, documented long-term residency by individuals and the existence of multiple small and resident populations precisely where Navy training and testing have been occurring for decades strongly suggests a lack of significant impact to those individuals and populations from the continuation of Navy training and testing.

As described throughout this appendix, there are many specific and necessary training and testing areas around Oahu, Kauai, and Niihau. This mitigation would not be practical to implement, nor is it expected to be particularly biologically effective at reducing adverse impacts.

Critical habitat of main Hawaiian Islands insular false killer whales

The Navy provided an analysis of Main Hawaiian Islands insular false killer whales in Section K.3.3 (False Killer Whales Small and Resident Population Area: Main Hawaiian Islands Insular Stock). As discussed above in Section K.2.2 (Mitigation Areas to be Implemented), the Navy is proposing to implement two mitigation areas in Hawaii that overlap with areas designated as biologically important for main Hawaiian Islands insular false killer whale. See Section K.2.2 for details on the proposed Hawaii Island and 4-Islands Region Mitigation Areas.

1. Establish protective mitigation areas in all the biologically important areas:

As noted previously, on July 24, 2018, NMFS designated critical habitat for the main Hawaiian Islands insular false killer whale distinct population segment. The Navy worked with NMFS scientists and researchers during the identification of threats and development of the critical habitat. The critical habitat review process included an assessment of high use areas for main Hawaiian Island insular false killer whale in waters from the 45 m depth contour to the 3,200 m depth contour around the main Hawaiian Islands from Niihau east to Hawaii (83 FR 35062). Within these boundaries of the critical habitat NMFS excluded certain areas from designation under Section 4(b)(2) and 4(a)(3) of the ESA as shown in Figure 3.7 2. NMFS determined that some of these areas were areas of low-use and lower travelled areas as main Hawaiian Island insular false killer whale habitat, were areas where the Department of Defense maintains control of the area, or were areas unique for the Department of Defense that provide specific opportunities for training and testing. NMFS also determined that impacts from short delays from minor to major modifications to critical habitat and the need to consult outweigh benefits of protecting low-use and lower traveled habitat where future non-Department of Defense federal actions are unlikely.

Since the issuance of the final rule to designate critical habitat, the Navy has requested consultation for proposed critical habitat via the section 7 consultation process under ESA. With regard to the analysis of the identified biologically important areas for the Main Hawaiian Islands insular false killer whales, see Section K.3.3 (False Killer Whale Small and Resident Population Area: Main Hawaiian Island Insular Stock). With regard to the identified threats to the species, see Section 3.7.2.2.7.5 (Species-Specific Threats) and specifically the documented incidental take by commercial fisheries (Bradford & Forney, 2016; Oleson et al., 2010; Reeves et al., 2009; West, 2016). NMFS has previously determined that Navy's current training and testing activities are not expected to have fitness consequences for individual main Hawaiian Island insular false killer whales and are not likely to reduce the viability of the populations those individual whales represent; however, given the critical status of this distinct population segment, the Navy has proposed additional mitigation in areas that overlap with the designated biologically important areas and critical habitat for the main Hawaiian Island insular false killer whale (see Section K.2.2, Mitigation Areas to be Implemented). These mitigation areas were largely chosen to reduce exposure to mid-frequency active sonar and explosives on this rare stock.

The Navy and NMFS meet annually to discuss the state of the HSTT permit and biological opinion, new science if applicable, and other issues related to the HSTT consultations under MMPA and ESA. If NMFS proposes new designated biologically important areas within the Cetacean Density and Distribution Mapping Working Group process, the Navy will conduct the same detailed operational and biological

effectiveness assessments as done for other areas within the HSTT Study Area, as contained within this appendix.

Identification of additional important habitat areas

1. Identify additional important habitat areas across the HSTT Study Area, using the full range of data and information available to them (e.g., habitat-based density models, NOAA-recognized BIAs, survey data, oceanographic and other environmental data, etc.):

The above recommendation was based on a perception that the Navy has not identified additional areas of biological importance based on oceanographic features, such as seamounts, sea surface temperature fronts, and areas of persistent eddy activity. While the Navy did not specifically identify all oceanographic features that have the potential to be biologically important as mitigation areas, the Navy did consider all identified and suggested areas of potentially important habitat in this appendix. In Section 3.7.2 (Affected Environment), the latest and best available science has been incorporated into the understanding of "Habitat and Geographic Range" for each species named sub-sections. Habitat-based density models have already been considered and integrated as detailed in the *U.S. Navy Marine Species Density Database Phase III for the Hawaii-Southern California Training and Testing Study Area* technical report (U.S. Department of the Navy, 2017b); biologically important areas identified in Calambokidis et al. (2015) and Baird et al. (2015a) have been considered; and that survey data, oceanographic, and other environmental data were incorporated into the density models. This proposal assumes the effectiveness of mitigation measures in the Atlantic based on oceanographic features found along the east coast of the U.S. indicates that such measures would be similarly feasible and effective in the Pacific. The Pacific does not have the same complex range of varied Large Marine Ecosystems nor does it have a large Continental Shelf that affords the types of oceanographic features found on the Atlantic coast. Habitat information is already included in the Navy's modeling and analysis, and it is not expected that further geographic subdivision based on habitat and sometimes ephemeral oceanographic features would be any more protective than existing procedural and geographic mitigation. The purpose of identifying habitat for geographic mitigation is to reduce adverse impacts associated with the proposed action, where determined to be biologically effective and operationally practical. All locations within the HSTT Study Area have been used for Navy training and testing for decades. There has been no scientific evidence to indicate the Navy's activities are having adverse effects on populations of marine mammals, many of which continue to increase in number or are maintaining populations based on what regional conditions can support.

The Navy and NMFS meet annually to discuss the state of the HSTT permit and biological opinion, new science if applicable, and other issues related to the HSTT consultations under MMPA and ESA. If NMFS proposes new designated biologically important areas within the CETMAP process, the Navy will conduct the same detailed operational and biological effectiveness assessments as done for other areas within the HSTT Study Area, as contained within this appendix.

Standoff distances around mitigation areas

1. Establish stand-off distances around Mitigation Areas to the greatest extent practicable, allowing for variability in size given the location of the Area, the type of operation at issue, and the species of concern:

The geographic and procedural mitigation areas are developed to effect the least practicable adverse impact on marine mammal species or stock and their habitat. The assessment of impacts and mitigation effectiveness considers quantitative analysis of species-specific and stressor-specific ranges to effects

(see Chapter 3, Affected Environment and Environmental Consequences). Procedural and geographic mitigation areas are already variable in size, taking into consideration location, operational footprint, and species (e.g., the Humpback Whale Cautionary area is seasonal, activity- and location-specific procedural mitigation is provided via Protective Measures Assessment Protocol). The mitigation identified in Section 5.4 (Mitigation Areas to be Implemented) and Section K.2.2 (Mitigation Areas to be Implemented), represents the maximum size of mitigation areas that are practical to implement. Implementing additional mitigation (e.g., stand-off distances that would extend the size of the mitigation areas) beyond what is described in Section K.2.2 (Mitigation Areas to be Implemented) would be impractical due to implications for safety (the ability to avoid potential hazards), sustainability (maintain readiness), and the Navy's ability to continue meeting its Title 10 requirements.

K.2.2.5 Mitigation Summary

In summary, the Navy has thoughtfully and thoroughly assessed every single individual mitigation measure proposed by commenters, as well as those measures that were part of the Navy's previous settlement. Furthermore, the Fleet and SYSCOM Commanders have approved all mitigation as described herein this appendix and Chapter 5 (Mitigation). It is also worth noting that if viewed comprehensively, adopting each additional mitigation measure recommended by all comments would result in the Navy effectively losing access to the significant majority of the required training and testing space necessary to comply with the Navy's statutory requirement to prepare a ready force. The suggested mitigation measures in their totality would prohibit Navy training and testing using sonar and explosives in much of the primary training and testing areas with the HSTT Study Area, leaving fragmented areas and timeframes that are not compatible with effective, realistic training and testing. The Navy would be unable to effectively prepare its forces for operational employment without access to the ranges and locations that have been carefully developed over decades. These areas allow for Navy activities to be conducted in a manner compatible with multiple other activities in the marine environment, such as energy exploration, alternative energy development, commercial fishing, recreational activities, and commercial shipping. As noted in Chapter 2 (Description of Proposed Action and Alternatives), the Navy also requires extensive sea space so that individual training and testing activities can occur at sufficiently safe distances such that these activities do not interfere with one another and so that Navy units can train to communicate and operate in a coordinated fashion over tens or hundreds of square miles, as they will have to do when in an operational theater.

K.3 Biologically Important Areas Within the Hawaii Range Complex Portion of the HSTT Study Area

K.3.1 Main Hawaiian Islands Humpback Whale Reproduction Area

A single biologically important area around and between portions of the main Hawaiian Islands was designated for breeding humpback whales during the 5-month period from December through April (Baird et al., 2015a) (Figure K.3-1). Portions of the biologically important area around and between the eight islands have been considered separately in the following subsections, because the various portions are separated geographically, and Navy training and testing activities that occur in the different portions of the biologically important area can differ significantly. As shown in Table K.1-1, and described in Section K.1.1.2 (Provisional 2015 Prohibited or Restricted Areas within HSTT Study Area), the Main Hawaiian Islands Humpback Whale Reproduction Area overlaps with HSTT Settlement Areas 1-B, 1-C, 1-D, 1-E, 2 A, 2-B, 2-D, and 2-E. The Main Hawaiian Islands Humpback Whale Reproduction Area also overlaps the Navy's existing Humpback Whale Cautionary Area and Humpback Whale Special Reporting

Areas described in Section K.1.1.4.1 (Mitigation Areas Currently Implemented) and shown in Figure K.1-5. The Main Hawaiian Islands Humpback Whale Reproduction Area covers approximately 5,845 square km (km^2) of water space and encompasses the entire Humpback Whale National Marine Sanctuary.

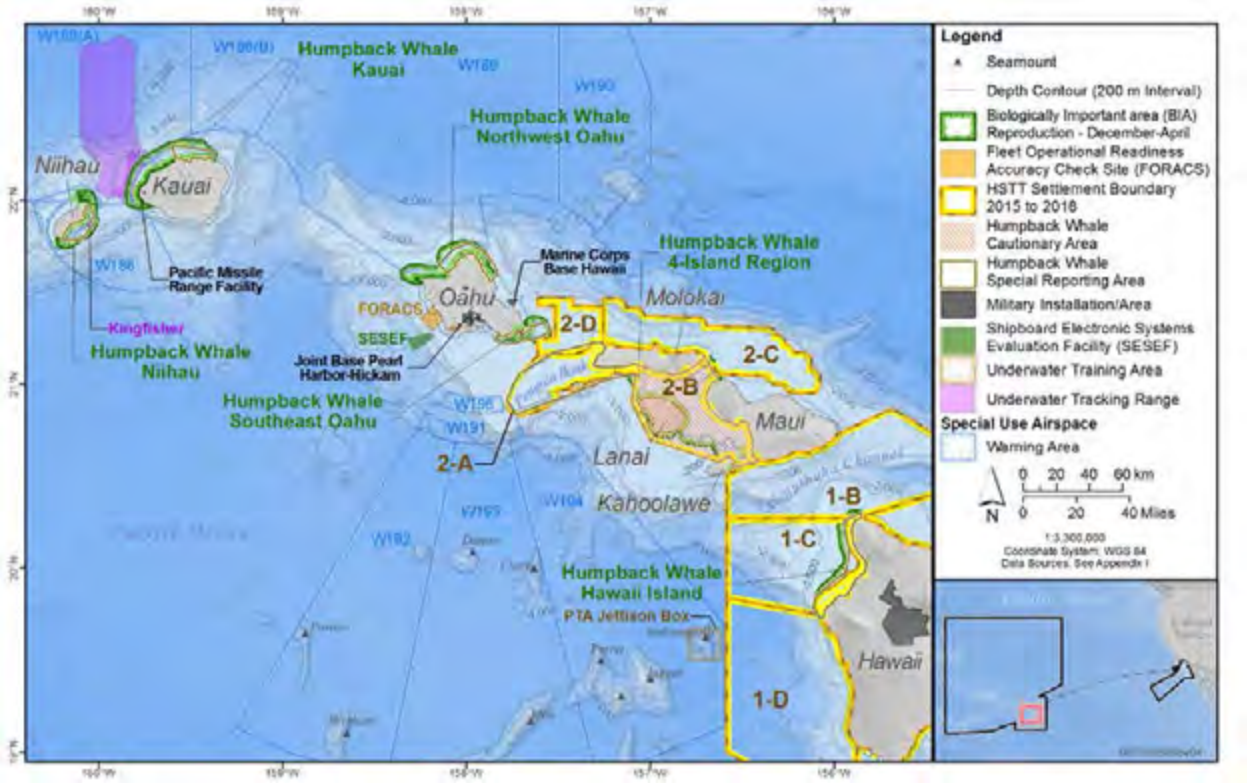


Figure K.3-1: Main Hawaiian Islands Humpback Whale Reproduction Area

K.3.1.1 General Biological Assessment

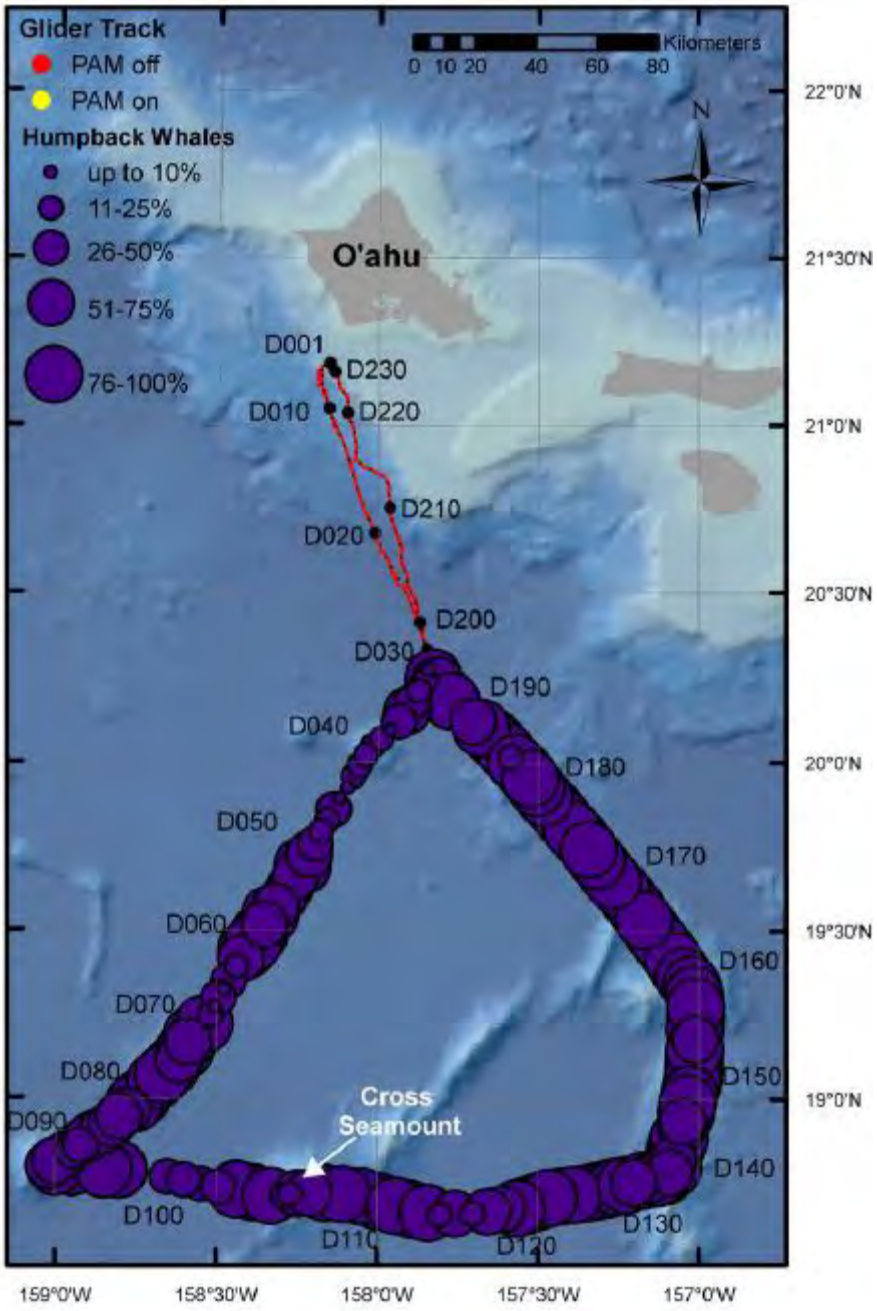
For a thorough description of the humpback whales in Hawaii, see Section 3.7.2.3.1 (Humpback Whale [*Megaptera novaeangliae*], Hawaii Distinct Population Segment). Humpback whales of the Hawaii Distinct Population Segment were removed from the list of threatened and endangered species under the ESA (National Marine Fisheries Service, 2016b). The population of humpback whales in the Hawaiian Islands has continued to increase and is now larger than some pre-whaling abundance estimates (Barlow et al., 2011; Wade et al., 2016); the North Pacific population is increasing at a rate of between 5.5 percent and 6.0 percent per year, approximately doubling every 10 years (Bettridge et al., 2015; Muto et al., 2017; Wade et al., 2016).

A review of the available literature indicates humpback whales in the Hawaii Distinct Population Segment of breeding in Hawaii have been "matched" (i.e., identified as the same individual whale using photo-identification methods) to humpbacks feeding in the Gulf of Alaska, the Aleutian Islands, and Bering Sea (Baird et al., 2015a; Calambokidis et al., 2008). In all of these feeding areas, humpback whales from Hawaii cross paths with humpback whales migrating from Mexico and Central America. In addition, there is evidence that some individual humpback whales (most likely males) move between winter breeding areas in Hawaii and Mexico (Forestell & Urban R., 2007) and Hawaii and Japan (Salden et al., 1999) within a season.

The majority of humpback whales in the waters off Hawaii have been detected within the shallow waters of the 200 m isobaths (Mobley et al., 2001; Mobley, 2005; Mobley & Pacini, 2013; Mobley & Deakos, 2015; Mobley et al., 2015). The greatest densities of humpback whales (including calves) have been in the 4-islands region around Maui, Molokai, Kahoolawe, and Lanai, as well as Penguin Bank (Mobley et al., 2001) and around Kauai (Mobley, 2005).

A March 2007 pilot survey across the Northwest Hawaiian Islands documented extensive wintering habitat used by humpback whales in the Northwest Hawaiian Islands (Johnston et al., 2007). Acoustic recordings near the Northwest Hawaiian Islands indicate that humpback whales are present there as well as off the Main Hawaiian Islands from early December through early June (Lammers et al., 2011). These results, coupled with habitat modeling, suggest that humpback whales may be extending their overwintering range to include waters surrounding portions of the Northwest Hawaiian Islands (Baird et al., 2015a). The available visual sighting and tagging data also suggest that individuals are using these areas during February and March. It is not yet known if this represents a previously undocumented breeding stock or if the whales occurring at the Northwest Hawaiian Islands are part of the same population that winters near the Main Hawaiian Islands (Bettridge et al., 2015).

Vocalizing humpback whales have been detected farther offshore outside the designated Main Hawaiian Island Reproduction Area (Klinck et al., 2015). Between December 11, 2014, and January 26, 2015, a passive acoustic survey was conducted in the Hawaii Range Complex using an autonomous glider fitted with a hydrophone (Figure K.3-2). Humpback whale songs were recorded during the entire survey, and usually more than one whale was recorded at the same time. The percentage of the recording time during which vocalizations were recorded is represented by the size of the circles in Figure K.3-2. For example, the two largest circles on the map indicate that humpback vocalizations were recorded during more than half of the time the glider was recording. Vocalizing humpbacks were detected as far as 300 km offshore. Based on the signal strength for some of the vocalizing humpbacks, they were very close to the glider indicating those individuals would have been 100 to 300 km offshore, not in the nearshore shallow water areas previously documented as their preferred habitat (Klinck & Nieukirk, 2016).



Source: Adapted from Klinck et al. (2015)

Figure K.3-2: Humpback Whale Encounters During a Passive Acoustic Survey South of Oahu. Circle Size Indicates Percentage of Recording Time per Dive with Target Signals

Notes: PAM = Passive Acoustic Monitoring

In addition to occurring in the Hawaii Range Complex, humpbacks migrating from breeding grounds in Hawaii to feeding grounds at higher latitudes may pass through the eastern portions of the Transit Corridor.

K.3.1.1.1 Biological Considerations Applicable to all Humpback Whale Reproduction Areas

The Main Hawaiian Islands Humpback Whale Reproduction Area contains several humpback whale breeding sub-areas off the coasts of Kauai, Niihau, Oahu, Maui, and Hawaii Island. The area was designated as important for reproductive behavior because extensive photo-identification and satellite tagging studies have identified the area as having the highest density of breeding humpback whales within the Main Hawaiian Islands (Baird et al., 2015a). Over half (7,000–10,000 individuals) of the North Pacific population migrates to Hawaiian waters during the winter breeding season, with peak abundance from February through March (Baird et al., 2015a; Mobley et al., 1999; Mobley et al., 2001; Norris et al., 1999). The highest densities of whales occur in waters that are less than 200 meters (m) in depth. The boundaries of the biologically important sub-areas are based on the highest density areas within the Main Hawaiian Islands and, with the exception of two small areas, one off Kauai and one off Molokai, are within the 1,000 m isobaths (Baird et al., 2015a).

Recent tagging data suggests that humpback whales spend an average of four weeks in Hawaiian waters—from the time of tagging to the time of departure—regardless of the month when tagging occurs (Mate et al., 2017). Some variation in residence time was observed between the sexes. Mature females without a calf stayed for shorter periods than mature males, likely because the females only needed to stay long enough to breed successfully, whereas the males remained to inseminate as many females as possible before reduced energy reserves compelled them to begin their northward migration to feeding grounds off of Alaska. Females with a new calf may stay in Hawaiian waters for 10 weeks or longer to allow calves more time to build muscle mass, gain coordination, and accumulate insulating blubber that will function as an energy reserve during migration (Mate et al., 2017). Investigations in the Maui Basin over 12 consecutive breeding seasons (1997 through 2008) found the water depth and sea-bed terrain type preferences of individual mother-calf pairs varied systematically within a breeding season, with the pair moving into deeper water and rougher terrain as a calf matured (Pack et al., 2017).

Aerial surveys by Mobley et al. (1999) of humpback whale breeding areas around Hawaii Island, 4-Islands Region (Molokai, Lanai, Maui, Kahoolawe), Penguin Bank, Oahu, and Kauai/Niihau showed a trend of an increasing number of sightings moving northwest along the island chain. These data suggested that, from as far back as 1999, the wintering population may have been expanding beyond previously preferred reproductive sites near the 4-Islands Region and Penguin Bank. In the mid-1990s, satellite tagging of six humpback whales off Kauai found that whales transited between islands at a greater pace than initially thought. One adult traveled 250 km around Kauai and then to Oahu in four days, while another individual traveled to Penguin Bank and the Kalohi Channel between Molokai and Lanai, totaling 820 km, in 10 days (Mate et al., 1998). A steady increase of 7 percent per year in the density of the Hawaii breeding population between 1993 and 2000 was reported by Mobley et al. (2001). The authors noted that the increase was all the more impressive considering it occurred simultaneously with a rapid increase in the popularity of whale watching and the industry's economic importance.

Zoidis et al. (2014) recorded video of calf behavior at breeding sites in Hawaiian waters and observed that behavior varied between male and female calves and as the breeding season progressed leading up to the seasonal migration, but did not vary significantly with sea state. This result suggests that innate developmental drivers can persist in the presence of external disturbance.

K.3.1.1.2 Stressor Analysis

Numerous studies have documented a variety of responses by humpback whales to anthropogenic disturbance. Watkins (1981) found that humpback whales largely ignored vessels that remained 100 m or more away, and similarly Mobley et al. (2001) noted that humpback whale breeding success appeared unaffected by the frequent presence of whale watching vessels as acoustic and physical disturbance stressors.

K.3.1.1.2.1 Sonar and Other Transducers

As detailed in Section 3.7.3.1.2 (Impacts from Sonar and Other Transducers), humpback whales may be exposed to sound from sonar and other transducers used during training and testing activities. Quantitative acoustic analysis for the entire Hawaii population estimates that the majority of exposures result in behavioral reactions or TTS, and only a few exposures resulting in PTS or injury are anticipated.

While the Main Hawaiian Islands Humpback Whale Reproductive Biologically Important Area was proposed for breeding humpbacks, responses by humpback whales engaged in other behaviors to sonar or other transducers can be informative for assessing potential response to breeding behavior. Behavioral response studies have been conducted over a variety of contextual and behavioral states, helping to identify which contextual factors may lead to a response. Observed reactions during behavioral response studies have not been consistent across individuals based on received sound levels alone, and likely were the result of complex interactions between contextual factors, including distance to the source, whether or not the source is moving, and the physical presence of vessels in addition to the acoustic source (Goldbogen et al., 2013a; Harris & Thomas, 2015; Harris et al., 2015; Martin et al., 2015; Sivle et al., 2015).

In the presence of low-frequency active sonar, humpback whales were observed to increase the length of their songs (Fristrup et al., 2003; Miller et al., 2000), possibly due to the overlap in frequencies between the whale song and the low-frequency active sonar. A switch from vocal communication to physical, surface-generated sounds such as pectoral fin slapping or breaching was observed for humpback whales in the presence of increasing natural background noise levels, indicates that adaptations to masking can also move beyond vocal compensations (Dunlop et al., 2010).

Several individuals and pods of humpback whales have been observed during aerial or surface visual surveys while Navy training events using sonar were occurring (HDR, 2011; Mobley & Milette, 2010; Mobley & Pacini, 2012, 2013; Mobley et al., 2015; Shoemaker et al., 2014; Smultea & Mobley, 2009). No avoidance or other behavioral responses were ever noted, including in one case when the whales were observed within 5 km of a vessel using sonar with maximum received levels estimated to be between 135 and 161 decibels (dB) referenced to 1 micro Pascal (re 1 µPa) (Mobley & Pacini, 2012). One group of humpback whales moved along a course that would ultimately converge with the path of a Navy vessel using active sonar. The whales continued along their path despite the decreasing distance from the vessel and the active sonar source. In fact, the distance between the vessel and the whales decreased to the point where the sonar system had to be shut-down. The whales continued approaching, and swam under the vessel (Farak et al., 2011). Another group of humpback whales continued heading towards a vessel with active sonar, with an estimated median received level of 143 dB re 1 µPa, as the vessel was moving away for almost 30 minutes. This group was observed producing active surface behaviors such as pectoral slaps, tail slaps, and breaches. However, these are very common behaviors in competitive pods during the breeding season and were not considered to have occurred in response to the sonar (Mobley & Pacini, 2012; Mobley et al., 2012).

A series of studies was undertaken in 1997–98 pursuant to the Navy's Low-Frequency Sound Scientific Research Program. Humpback whales on breeding grounds were exposed to sonar operating in low-frequency bands ranging from 100 to 500 hertz, with received levels between 115 and 150 dB re 1 µPa. The studies found only short-term responses to low-frequency sound by some humpback whales, including changes in vocal activity and avoidance of the source vessel, while other humpback whales did not respond at all (National Marine Fisheries Service, 2015). Low-frequency signals from the sound source did not affect dive times of humpback whales in Hawaiian waters (Frankel & Clark, 2000).

Within the Hawaii Range Complex, training and testing activities that use sonar and other transducers primarily occur farther offshore than the designated boundaries of the Main Hawaiian Islands Humpback Whale Reproduction Area. Humpback whales within the breeding area may be exposed to sound from sonar and other transducers used during activities occurring outside of the area, because of the substantial transmission ranges associated with some sonar. While impacts on humpback whale breeding and other behaviors due to training and testing with sonar and other transducers may occur within the reproduction area, they are unlikely to rise to the level of significant under NEPA nor would they be sustained for a duration long enough that it would cause an animal to be outside of normal daily variations in feeding, reproduction, resting, migration/movement, or social cohesion. Any TTS in the biologically important areas would be minor to moderate, from which the individual would fully recover quickly. Any PTS is limited to a couple individuals and is unlikely to occur within the reproduction area since these are areas where the Navy does not conduct intense activities, such as anti-submarine warfare training or testing during the reproductive season. While the potential exists for distant sound sources to be detected by individual humpback whales in the area, adverse impacts on the breeding behaviors of the population or most individuals would not be anticipated within the humpback whale reproduction areas from training and testing with sonar and other transducers.

K.3.1.1.2.2 Explosives

As detailed in the analysis in Section 3.7.3.2 (Explosive Stressors), some TTS and PTS exposures are estimated from the acoustic model. Any TTS in the biologically important areas would be minor to moderate, from which the individual would fully recover quickly. Any PTS is limited to a couple individuals and is unlikely to occur within the reproduction area since these are not areas where the Navy conducts activities using explosives.

Baleen whales, including humpbacks, have shown a variety of responses to impulsive sound sources including explosives. Observed responses have included avoidance, approaching the source, reduced surface intervals, altered swimming behavior, and changes in vocalization rates (Gordon et al., 2003; McCauley et al., 2000b; Richardson et al., 1985; Southall et al., 2009). Generally, the results of multiple studies on different species are assumed to be representative of all baleen whale species.

Research suggests the behavioral state of a whale and the location and movement of a sound source are integral drivers of how or if an animal responds, more so than the received level of the sound. Humpback whales migrating towards breeding grounds off western Australia showed limited avoidance behavior at ranges of 5–8 km from an impulsive seismic array, during observational studies (McCauley et al., 2000a). Auditory trauma was found in two humpback whales that died following the detonation of a 5,000 kilogram explosive used off Newfoundland during demolition of an offshore oil rig platform (Ketten et al., 1993), but the proximity of the whales to the detonation was unknown.

Within the Hawaii Range Complex, humpback whales may be exposed to sound or energy from explosions associated with training and testing activities, which occur throughout the year. However,

most activities that involve underwater detonations and explosive munitions typically occur more than 3 NM from shore in areas that are designated for explosive use except for some activities at the Navy's Puuloa Underwater Range near Pearl Harbor. Historical data suggests that explosive events are most likely to be scheduled at Puuloa Underwater Training Range, W-188, or KAPU HOT in W-192 south of Oahu (Figure K.3-3) for ease of scheduling, safety, instrumentation, and airspace concerns. These areas are outside of the Main Hawaiian Islands Humpback Whale Reproduction Area, though W-188 is adjacent to the Northwest Kauai portion of the reproduction area. Humpback whales within the breeding area would not be directly exposed to sound or energy from explosions; therefore, impacts on breeding behaviors would not be anticipated within the humpback whale reproduction area from training and testing with explosives.

K.3.1.1.2.3 Vessel Strikes

Vessel strikes have been documented for almost all mysticete species (Van der Hoop et al., 2015), including humpback whales (Lammers et al., 2003; Vanderlaan & Taggart, 2007). From 2007 to 2012 in Hawaii, there were 39 vessel collisions between humpback whales and vessels (Bradford & Lyman, 2015), none of which involved Navy vessels. From 1975 to 2011, 61 percent of collisions witnessed between humpback whales and vessels in Hawaii involved tour vessels (Lammers et al., 2013); however, some vessel types may under-report collisions. U.S. Coast Guard and U.S. Navy vessels are required to report all vessel collisions with whales. There has not been a Navy vessel strike to a humpback whale in Hawaiian waters within at least the last decade.

Most training activities and many testing activities involve the use of vessels. Vessel strikes to large whales in the past have not been associated with any specific training or testing activity but were rather a limited, sporadic, and accidental result of vessel movements within the HSTT Study Area. Vessel movements can be widely dispersed throughout the HSTT Study Area, but for the most part occur within the established range complexes, and in Hawaii are concentrated at Pearl Harbor. Refer to Section 3.0.3.3.4.1 (Vessels) for estimated vessel use by range complex.

K.3.1.2 Northwest Kauai Humpback Whale Reproduction Area

The Northwest Kauai Humpback Whale Reproduction Area is located on the northwest side of Kauai, extending from Kilauea, around the Na Pali coast, into the Kaulakahi Channel, and to Waimea Bay on the southwestern side of the island (Figure K.3-1). The area reaches from the shoreline to approximately 44 km offshore. The water depth in the biologically important area is within the 1,000 m isobaths, which encompasses the depth range of habitat preferred by both male and female humpbacks (Baird et al., 2015a). Two bays are adjacent to the biologically important area; Hanalei Bay is on the north shore of Kauai, and Waimea Bay is on the west shore. A small boat harbor called Kikiaola is located near Waimea Bay.

The Northwest Kauai Humpback Whale Reproduction Area does not overlap with any HSTT Settlement Areas; however, the area does overlap with the existing Humpback Whale Special Reporting Area and the Hawaiian Island Humpback Whale National Marine Sanctuary located on the north side of Kauai (Figure K.3-1).

K.3.1.2.1 Navy Requirements for Area-Specific Training and Testing

The Northwest Kauai Humpback Whale Reproductive Area overlaps with the Navy's Shallow Water Training Range and a small portion of the Barking Sands Tactical Underwater Range, both of which are part of the U.S. Naval Pacific Missile Range Facility (hereafter referred to as Pacific Missile Range Facility)

on the western side of Kauai. The Pacific Missile Range Facility contains the Navy's premier instrumented, multi-environmental ranges which are used for a variety of training and testing activities (see Section 2.1.1, Hawaii Range Complex). The Pacific Missile Range Facility is the world's largest instrumented multi-environment range capable of supporting surface, subsurface, air, and space operations simultaneously. Both the Shallow Water Training Range and the Barking Sands Tactical Underwater Range are under controlled or restricted air space, specifically Warning Area 188(A) (W-188A) and Restricted Area 3101 (R-3101) (Figure K.3-1).There are over 1,100 square miles of instrumented underwater range and over 42,000 square miles of controlled airspace. The Pacific Missile Range Facility supports operations which vary from small, single-unit exercises up to largescale, multiple-unit battle group scenarios.

The existing infrastructure is unique, providing a full spectrum of range support, including radar, underwater instrumentation (e.g., bottom-mounted transducers and hydrophones), telemetry, electronic warfare, remote target command and control, communications, data display and processing, and target⁄weapon launching and recovery facilities. The Barking Sands Tactical Underwater Range provides underwater tracking and communication for an area of approximately 100 NM^2, and the Shallow Water Training Range covers 80 NM^2.

Both the Barking Sands Tactical Underwater Range and the Shallow Water Training Range are regularly used for anti-submarine warfare, anti-submarine tracking exercises, anti-submarine torpedo exercises, and anti-submarine coordinated exercises like Submarine Command Course and Rim of the Pacific, while the Barking Sands Tactical Underwater Range is specifically used for Naval Surface Fire Support. These ranges provide operators with a shallow-water sonar training area to conduct shallow-water sonar proficiency training and readiness activities under realistic conditions on an instrumented range.

Mine-laying events are designed to train forces to conduct offensive (deploying mines to tactical advantage of friendly forces) and defensive (deploying mines for protection of friendly forces and facilities) mining events. Aerial mining occurs off the southwest coast of Kauai and the southeast coast of Niihau, in W-186 and W-188. Submarine mining events are conducted in W-188. Air Operations are conducted within R-3101, which completely overlaps the Northwest Kauai Humpback Whale Reproductive Area. Inert mine shapes may be released into the ocean during these training events. W-188 is used for a variety of anti-air warfare and -surface warfare exercises including torpedo, missile and gunnery exercises, however, only small nearshore portions of W-188(a) and W-186 overlap with the Humpback Whale Reproduction Area around Kauai. However, is it unlikely that torpedo, missile and gunnery events would overlap with the biologically important area because of its nearshore location; these events typically occur further offshore.

The Pacific Missile Range Facility supports training, tactics development, and testing of air, surface, and subsurface weapons systems for the Navy. The instrumentation on the ranges yields a 10 ft. tracking accuracy, which is crucial for reconstruction, grading and feedback on events. This maximizes the value of available training and testing opportunities. Because of its unique infrastructure and un-encroached geographic range, it is also the lead range for a variety of testing and evaluation events. Ongoing testing and evaluation programs include torpedo, torpedo defense, submarine and periscope detection, ship-defense systems, and other miscellaneous programs (such as gunnery and special weapons tests).

K.3.1.2.2 Northwest Kauai Humpback Whale Reproduction Area Mitigation Considerations

The Northwest Kauai Humpback Whale Reproduction Area is mostly in shallow, nearshore waters of Kauai where the Navy does not typically conduct activities that involve sonar or other transducers. The Navy typically conducts the vast majority of more complex and coordinated anti-submarine warfare training or testing and major training events farther offshore on the underwater-instrumented ranges in waters that do not overlap with the Northwest Kauai Humpback Whale Reproduction Area.

A portion of the Northwest Kauai Humpback Whale Reproduction Area overlaps the Humpback Whale Special Reporting Areas, where since 2009, annual reporting indicates this is a low use area for mid-frequency active sonar during the humpback whale reproduction period. However, sound from sonar or other transducers or explosives used within the Shallow Water Training Range and the Barking Sands Tactical Underwater Range could propagate into the humpback whale reproduction area and potentially expose whales located within the area to acoustic stressors. Sound propagating from a distant source is subject to signal loss as it travels through the water column and transitions from deep water to shallow water areas, which would result in lower received levels within the reproductive area. Animals within the Northwest Kauai Humpback Whale Reproduction Area could be exposed to sound from sonar or other transducers and sound and energy from explosives, and some behavioral or temporary impacts could occur from the occasional use of sonar and explosives during training and testing events at the Pacific Missile Range Facility. Reducing or limiting Navy training and testing in the Kauai area as part of geographic mitigation would push critical training and testing into areas that may be constrained, or require deconflicting air and seaspace with other users, could compromise personnel safety, and would reduce the effectiveness of training and testing by increasing the risk to safety and encroachment. One of the primary purposes of the Navy's instrumented ranges is to facilitate a safe training and testing environment for surface vessels and submarines operating simultaneously by acoustically tracking event participants.

K.3.1.3 East Niihau Humpback Whale Reproduction Area

The East Niihau Humpback Whale Reproduction Area is located on the east side of Niihau, extending along the east side of the island from Kawaihoa Point to the northern tip of the island and including a portion of the Kaulakahi Channel, which separates Niihau and Kauai (Figure K.3-1). The water depth in the biologically important area ranges up to approximately 870 m (2,800 ft.), within the range of habitat preferred by both male and female humpbacks (Baird et al., 2015a). Several bays and inlets are located along the coast of Niihau and adjacent to the biologically important area, but none of these areas are populated.

The East Niihau Humpback Whale Reproduction Area does not overlap with any HSTT Settlement Areas; however, the East Niihau Humpback Whale Reproduction Area does overlap with the existing Hawaiian Islands Humpback Whale National Marine Sanctuary and the Humpback Whale Special Reporting Area in Hawaii.

K.3.1.3.1 Navy Requirements for Area-Specific Training and Testing

Vessels and aircraft transit through this area for tactical scenarios in the course of training and testing events associated with the Pacific Missile Range Facility.

K.3.1.3.2 East Niihau Humpback Whale Reproduction Area Mitigation Considerations.

The East Niihau Humpback Whale Reproduction Area is mostly in shallow, nearshore waters where the Navy does not typically conduct activities that involve sonar or other transducers. Explosives are not typically used within the East Niihau Humpback Whale Reproduction Area.

K.3.1.4 North Oahu Humpback Whale Reproduction Area

The North Oahu Humpback Whale Reproduction Area is located on the north side of Oahu. The reproduction area extends from Kaawa on the east side of Oahu, around Kahuku Point, and then around Kaena Point on the west side of the island (Figure K.3-1). The area extends seaward approximately 17 km from shore along its entire length. The water depth in the biologically important area ranges up to approximately 700 m, which is shallower than other reproductive areas and may be used more by female-calf pairs than males (Baird et al., 2015a). There are no major ports landward of the area.

The North Oahu Humpback Whale Reproduction Area does not overlap with any HSTT Settlement Areas; however, it does overlap with the Main Hawaiian Islands Humpback Whale National Sanctuary and the existing Humpback Whale Special Reporting Area.

K.3.1.4.1 Navy Requirements for Area Specific Training and Testing

The North Oahu Humpback Whale Reproduction Area overlaps minimally with Warning Area 189 (W-189). While W-189is routinely used by MH-60s and other rotary wing aircraft for non-explosive gunnery and rockets, and for dipping sonar used during anti-submarine warfare training, these activities occur outside of the reproduction area. Training and testing using in-water explosives are not typically conducted within the boundaries of the North Oahu Humpback Whale Reproduction Area as this area is not a designated underwater training range nor is it within Special Use Airspace.

K.3.1.4.2 North Oahu Humpback Whale Reproduction Area Mitigation Considerations

The North Oahu Humpback Whale Reproduction Area is in shallow, nearshore waters where the Navy does not typically conduct activities that involve sonar or other transducers, especially more intense activities such as anti-submarine warfare training and testing or major training events, or the use of explosives. Designated Navy training ranges offshore of Oahu are all located on the south side of the island and do not overlap with the North Oahu Humpback Whale Reproduction Area.

As discussed in Section 3.7.3.1.2 (Impacts from Sonar and Other Transducers) and 3.7.3.2.2 (Impacts from Explosives), humpback whale reactions to sonar and explosives are most likely short term and mild to moderate, especially when sound sources are located more than a few kilometers away and when the animals are engaged in important biological behaviors, like feeding or calling at breeding sites.

K.3.1.5 Southeast Oahu Humpback Whale Reproduction Area, and Settlement Area 2-D

The Southeast Oahu Humpback Whale Reproduction Area is located on the southeast side of Oahu, and extends from Diamond Head, around Maunalua Bay, Koko Head, and Makapuu Point and north into the southern half of Waimanalo Bay (Figure K.3-1). The biologically important area extends 33 km along its length on the coastline from Makapuu Point (Baird et al., 2015a). The water depth in the biologically important area ranges up to approximately 600 m.

The Kaiwi Channel (also called the Molokai Channel) separates the islands of Oahu and Molokai and is approximately 49 km wide. This reproduction area overlaps with a coastal portion of the channel, with the Hawaiian Islands Humpback Whale National Sanctuary and with a very small and essentially negligible portion of HSTT Settlement Area 2-D. Maximum depth in the channel is approximately 700 m.

It would not be unusual for humpback whales to traverse the channel as they travel between Penguin Bank and areas off Oahu.

K.3.1.5.1 Navy Requirements for Area-Specific Training and Testing

As described earlier in this appendix, the Kaiwi Channel is used to simulate strait transits and protecting high-value units within a channel environment for Navy vessels based in Pearl Harbor, rather than transiting to channels further away. It is a valuable training area for utilizing mid-frequency active sonar detection systems during anti-submarine warfare training when ships and submarines are present in this area. While larger, coordinated training events that involve protecting a high-value unit during a strait transit typically occur in the seaspace west of Hawaii Island (a primary venue for carrier strike group training) or in the Alenuihaha Channel, the Kaiwi Channel is used primarily during unit-level training.

Training and testing using in-water explosives are not conducted in the Kaiwi Channel, as this area is not a designated underwater training range or within Special Use Airspace, typically necessary for in-water explosive usage.

K.3.1.5.2 Southeast Oahu Humpback Whale Reproduction Area Mitigation Considerations

The Southeast Oahu Humpback Whale Reproduction Area is in shallow, nearshore waters where the Navy does not routinely conduct activities that involve sonar or other transducers, especially more intense activities such as anti-submarine warfare training and testing or major training events. Designated Navy training ranges offshore Oahu are all located on the south side of the island and do not overlap with this Humpback Whale Reproduction Area.

As discussed in Section 3.7.3.1.2 (Impacts from Sonar and Other Transducers) and 3.7.3.2.2 (Impacts from Explosives), humpback whale reactions to sonar and explosives are most likely short term and mild to moderate, especially when sound sources are located more than a few kilometers away and when the animals are engaged in important biological behaviors, like feeding or calling at breeding sites.

K.3.1.6 4-Islands Region and Penguin Bank Humpback Whale Reproduction Area, and Settlement Areas 2-A and 2-B

The 4-Islands Region Humpback Whale Reproduction Area encompasses an area of approximately 2,000 square kilometers (km^2). The area is located south of the island of Molokai and encompasses the area over Penguin Bank and between Lanai, Maui, and Molokai. Penguin Bank extends southwest approximately 60 km off Molokai and is 30 km at its widest point. Dynamic oceanographic conditions characterize the area, which includes Kalohi Channel between Molokai and Lanai, Pailolo Channel between Molokai and Maui, the Kealaikahiki Channel between Lanai and Kahoolawe, the Alakeiki Channel between Maui and Kahoolawe, Kanapou Bay on Kahoolawe, Maalaea Bay on Maui, and the Kaunakakai Harbor on Molokai. The water depth in much of the biologically important area is less than 400 m, which is shallower than other reproductive areas and may be preferred by female-calf pairs more than males (Baird et al., 2015a).

The 4-Islands Region Humpback Whale Reproduction Area overlaps with HSTT Settlement Area 2-A and 2-B, the Main Hawaiian Island Humpback Whale National Marine Sanctuary, and the Humpback Whale Cautionary Area.

K.3.1.6.1 Navy Requirements for Area Specific Training and Testing

The 4-Islands Region provides a unique training capability that does not exist elsewhere in the Hawaii Range Complex and is an ideal location for shallow water anti-submarine and mine warfare activities because of the bathymetry and bottom type. This unique combination of bathymetry and bottom type is very limited within the Hawaii Range Complex which provides invaluable training in a shallow water environment for anti-submarine warfare search, tracking and avoidance of opposing forces. Penguin Bank particularly is used for shallow water submarine testing and anti-submarine warfare training because of its large expanse of shallow bathymetry. While submarines do not typically use mid-frequency active sonar, relying primarily on passive sonar (listening mode) to avoid detection from adversaries, submarines are required to train in counter detection tactics, techniques and procedures against threat surface vessels, airborne anti-submarine warfare units and other threat submarines using mid-frequency active sonar as part of both their prospective Commanding Officers qualification course and pre-deployment certification.

The ability for surface vessels and air assets to simulate opposing forces, using mid-frequency active sonar when training with submarines, is critical to submarine crew training for deployed and combat operations. Surface warfare training is designed to support unit-level training requirements and group cross-platform events in 28 mission areas for surface ship certification prior to deployment. The Required Operational Capabilities and Required Operational Environment guidance outlines anti-submarine warfare areas specifically requiring crews to accomplish 58 major tasks to support both deep and shallow water anti-submarine training activities, across multiple domains of the open ocean and littoral areas, while conducting unit and group self-defense training across multiple platforms and defensive operations.

Submarine Command Course training is conducted twice a year in Hawaii, in February and August, (with the intermittent use of active sonar over a three-to-five-day period per event). Submarine Command Course training is a medium coordinated Anti-Submarine Warfare Training exercise (see Table 2.3-2). The 4-Islands Region is used for Submarine Command Course training as a location to train prospective Submarine Commanding Officers to operate in shallow water. The Pailolo and Kalohi Channels are used to simulate strait transits and provide valuable experience that the prospective Commanding Officers would experience while deployed. The Pailolo and Kalohi Channels are used to simulate strait transits and provide a realistic shallow water environment for qualification of prospective Commanding Officers. The winter (February) Submarine Command Course training will typically occur north of Maui to avoid typical whale reproduction areas from December to April.

While the HSTT settlement agreement prohibits the use of in-water explosives for training and testing in Areas 2-A and 2-B which overlap with the Humpback Whale Reproduction Area, the area has not typically been used for explosives training and testing. All training in the 4-Islands Region is conducted using non-explosive munitions. The northern Maui Basin north of Kahului is used for shallow water non-explosive torpedo training. Non-explosive exercise torpedo firing could also be scheduled in the area between Maui, Lanai, and Kahoolawe but generally only in summer (August) during Submarine Command Course. For the winter Submarine Command Course typically conducted in February, exercise torpedo firings will typically be north of Maui to avoid areas of high densities of humpback whales. This is the only location where the Navy can conduct very shallow water exercise torpedo firings at surface ships, MK-30 targets and simulated operating forward submarines. In addition to being non-explosive, these torpedoes and targets are recoverable in this shallow water area if they experience a failure of the buoyancy systems.

Surface vessels and air assets work with submarines in that area while conducting submarine Commanding Officer's training scenarios that include extended shallow water operations at periscope depth, general surveillance missions in shallow water, shallow water weapons employment, close to shore navigation, shallow water minefield operations, and shallow water ship control. Such training evolutions are necessary for the Commanding Officer to learn the skills necessary, while protecting the vessel, to ensure the crews are capable of executing their mission. Additionally, the 4-Islands Region possesses other attributes that make it an important area for anti-submarine and mine warfare training and testing:

Training and certifications are conducted throughout the year in support of Pacific Command/ Joint Staff ordered deployment requirements and combat mission crew readiness. A typical submarine exercise is approximately three to four days in duration.

Kahoolawe Minefield is utilized by submarine crews and during Submarine Command Course certification training for mine counter measure training and certification. Kahoolawe Minefield is used throughout the year to support mine counter measure training in support of combat missions. Mine counter measure training is typically less than one day and does not involve use of mid-frequency active sonar by the submarine.

The area known as the Hawaii Area Tracking System, which is adjacent to the Kahoolawe Minefield, is used by submarine crews for Submarine Command Course certification training and certification for anti-submarine warfare missions. The certification training involves the employment of advance capability torpedoes (non-explosive exercise torpedoes) in a challenging shallow water and bottom type environment. Before an exercise torpedo is fired, extensive surface surveillance, which may include airborne assets, is conducted. These torpedoes are non-explosive and are recovered. Typically, training within the Hawaii Area Tracking System is one day in length and does not involve mid-frequency active sonar. While the name implies that the area is instrumented, the Navy never installed tracking system instruments in the area and the area remains un-instrumented (see Figure 2.1-5).

Expeditionary warfare training is conducted off the west coast of Maui to train swimmers to reach a beach with small boats in areas subject to limited access. During this training, no explosives are used.

Littoral Combat Ship training and certification of the anti-submarine and mine warfare mission modules may require use of the Kahoolawe Minefield and shallow water in this area.

Unit-elevel anti-submarine warfare training during the basic phase is conducted within this area.

Insertion and extraction utilizing small submersible vessels and small boats (rigid-hulled inflatable boats and zodiacs) is conducted around the waters off Maui.

K.3.1.6.2 4-Islands Region and Penguin Bank Humpback Whale Reproduction Area Mitigation Considerations

This area provides a unique and irreplaceable shallow water training capability for units to practice operations in littoral areas that are both shallow and navigationally constrained. This network of shallow water inter-island channels is unique within the mid Pacific training range complexes. The area provides an unmatched opportunity for Pearl Harbor based submarines to train in shallow water without the need to transit to the Southern California operating area for shallow water training and certification. Training and testing in these littoral areas will allow fleet units to continue to deploy improved sensors and tactics in littoral waters into the future.

While mid-frequency active sonar is used infrequently in this area, Submarine Command Course certification training effectiveness would be reduced if submarines and surface ships training were limited to only the Pacific Missile Range Facility, which already has a significantly busy training and testing schedule, making those additional events difficult to absorb. The training value within the 4-Islands Region is much higher due to the challenging and unique bathymetry (i.e., large shallow water areas) which allows for submarine crews to retain and improve their capabilities and to keep up with emerging technologies. However, the Navy recognizes the biological importance of this area to humpback whales during the reproductive season and strives to limit the use of surface ship hull-mounted mid-frequency active sonar during that time of year.

As discussed in Section 3.7.3.1.2 (Impacts from Sonar and Other Transducers) and 3.7.3.2.2 (Impacts from Explosives), humpback whale reactions to sonar and explosives are most likely short term and mild to moderate, especially when sound sources are located more than a few kilometers away and when the animals are engaged in important biological behaviors, like feeding or calling at breeding sites. The Navy does not typically use explosives in the 4-Islands Region.

The 4-Islands Region Humpback Whale Reproduction Area, excluding Penguin Bank, completely overlaps with Navy's current Humpback Whale Cautionary Area. As described above in Section K.3.1.6.1 (Navy Requirements for Area Specific Training and Testing), the Navy utilizes this area because of the unique characteristics for some military readiness activities. While balancing the importance of the area for humpback whales by avoiding or reducing adverse impacts from surface ship hull-mounted mid-frequency active sonar with the unique environment for training and testing, the Navy proposes to expand the size and extend the season of the mitigation area (Figure K.2-3) and continue to implement the requirement that the Navy would receive approval prior to the use of surface ship hull-mounted mid-frequency active sonar in the 4-Islands Region Mitigation Area during the calving season, see Section K.2.2 (Mitigation Areas to be Implemented).

K.3.1.7 Northwest Hawaii Island Humpback Whale Reproduction Area, Settlement Areas 1-B, 1-C, and 1-D

The Northwest Hawaii Island Humpback Whale Reproduction Area encompasses approximately 700 km^2 and is 17 km at its widest point. The area is located on the northwest side of the island of Hawaii and extends from the northern tip south for approximately 10 km to the westernmost point of the island, skirting Kawaihae Bay and Kiholo Bay. The water depth in the biologically important area reaches approximately 800 m. Vessels entering and leaving Kawaihae Harbor may transit through a portion of the biologically important area. No Navy ranges are located off the island of Hawaii.

The Northwest Hawaii Island Humpback Whale Reproduction Area overlaps with HSTT Settlement Areas 1-B, 1-C, and 1-D, the Hawaiian Islands Humpback Whale National Marine Sanctuary, and the Humpback Whale Special Reporting Area.

K.3.1.7.1 Navy Requirements for Area Specific Training and Testing

The Alenuihaha Channel, as well as the waters north and west of Hawaii Island, provides a unique training capability that does not exist elsewhere in the Hawaii Range Complex. The Alenuihaha Channel is an ideal location for strait transit training using mid-frequency active sonar. The Alenuihaha Channel is an actual channel that provides a vital and realistic analog for similar straits worldwide where the Navy operates, such as the South China Sea or the Strait of Hormuz. For example, transit training in the Alenuihaha Channel replicates these types of strait environments that meet the Navy's requirement to deploy Naval forces to ensure the free flow of commerce and the freedom of navigation by combatting

piracy or mine threats. Naval forces are required to train to counter a submarine threat before deployment – to ensure such forces obtain the required proficiency to conduct anti-submarine warfare in a controlled and observed environment prior to deployment to international straits across the globe, where operational Commanders require Naval forces to be able to conduct a range of military operations, including anti-submarine warfare. This required proficiency cannot be replicated by simulation and is most effectively obtained when conducted in a strait. Commanding Officers cannot be expected to effectively conduct such operations in a deployed environment if the first time they encounter a submarine in a strait is in a deployed setting. Additionally, this Channel provides a unique acoustic and tactical environment because there is a shallow trench running through part of the channel. There are few geographic areas that enable forces to do this type of training outside of the HSTT Study Area. In addition, the Alenuihaha Channel's location is particularly advantageous since it is located outside most of the civilian air traffic corridors approaching the Honolulu International Airport, which is necessary to safely de-conflict with civilian air traffic. This location also allows for an aircraft carrier to defend itself from submarine attack, with all available assets, while conducting straits transits, critical to its survival in forward operating areas.

While there are other channels within the Hawaii Range Complex used for strait transit training and anti-submarine warfare training, none provide the important attributes of the Alenuihaha Channel. The Alenuihaha Channel's proximity to the Pohakuloa Training Area allows for realistic training and reduces time and fuel costs between these training areas. The channel between Niihau and Kauai is also acceptable from a training perspective, but this would add at least two days of transit during each Under Sea Warfare training exercise (time required to move through a different channel and reposition to operating areas near Pohakuloa Training Area). The Kaiwi Channel between Oahu and Molokai is also acceptable from some mid-frequency active sonar training, but it is also a significant civilian air corridor, and raises safety concerns for anti-submarine warfare aircraft flying in that channel. In addition, the channel between Nihau and Kauai is proximate to the Pacific Missile Range Facility which would result in problems de-conflicting multiple activities and hazardous operations, raising safety concerns. For these reasons, Alenuihaha Channel is considered the most suitable for anti-submarine warfare training during certain training scenarios.

The Northwest Hawaii Island Humpback Whale Reproduction Area includes waters approaching Kawaihae Harbor, the point of amphibious insertion for forces proceeding to the range at Pohakuloa Training Area, which is the only range in the Hawaii Range Complex that supports ground force and aviation live-fire training. Training in this area allows for the integration of carrier strike group operations and amphibious landings, working in conjunction within a controlled airspace west of Hawaii Island for military training near the Pohakuloa Training Area.

As an air-to-ground range, Pohakuloa Training Area supports carrier strike group activities near a channel and near large open water areas for strike group maneuvering and submarine activities. Mid-frequency active sonar conducted to support strike maneuver and protect high value units (e.g., carrier) as aircraft go to strike at Pohakuloa Training Area is vital.

Hawaii Island is unique in that it is provides the only capable air-to-ground range able of conducting carrier and expeditionary strike group activities near a channel with unfettered access to the open ocean. Open ocean areas support strike group maneuvering, using mid-frequency active sonar to prosecute (detect/track) a submarine in the vicinity of a high value unit (e.g., carrier) as aircraft execute strikes into Pohakuloa Training Area. The area around Hawaii Island is also used by surface ships with anti-submarine warfare capability to train for clearing the sea space of any submarine threat before

Marines go ashore at Kawaihae Harbor (part of Rim of the Pacific and Marine Corps unit-level training scenarios). There are limited locations for amphibious landings in Hawaii due to existing environmental concerns. The west coast of Hawaii is one of the best locations for integrated joint marine amphibious operations because of its close proximity to the Pohakuloa Training Area which is the only range in the Hawaii Range Complex that supports ground force and aviation live-fire training.

Activities utilizing in-water explosives, such as bombing or torpedo exercises, are not conducted in the waters within this Main Hawaiian Islands Humpback Whale Reproduction Biologically Important Area since it is not within controlled airspace.

K.3.1.7.2 Northwest Hawaii Island Humpback Whale Reproduction Area Mitigation Considerations

The Northwest Hawaii Island Humpback Whale Reproduction Area is in shallow, nearshore waters where the Navy does not typically conduct activities that involve sonar or other transducers, especially more intense activities such as anti-submarine warfare training and testing or major training events or the use of explosives. While some impacts on reproductive behavior could occur depending on the proximity of sound-producing activities to the reproductive areas, humpback whale reactions to sonar and explosives (impulsive sounds) are most likely short term and mild to moderate, especially when sound sources are located more than a few kilometers away and when the animals are engaged in important biological behaviors, like feeding or calling at breeding sites.

The Navy balanced the need for the use of the area to meet training and testing requirements with the biological importance of the area for humpback whales and other species. The Navy proposes to implement mitigation areas that overlap the Northwest Hawaii Island Humpback Whale Reproduction Area. See Section K.2.2 (Mitigation Areas to be Implemented) for details on these proposed mitigation areas.

K.3.1.8 Humpback Whale Reproduction Area Mitigation Assessment

The Humpback Whale Reproduction Area overlaps with a small portion of the Hawaii Range Complex and specific ranges, and is located within nearshore waters where the Navy does not typically conduct activities that involve sonar or other transducers, especially more intense activities such as anti-submarine warfare training or major training events. However, animals within the area could be exposed to sound from sonar or other transducers, or explosions, and some behavioral or temporary impacts could occur. Humpback whale behavioral reactions to sonar and explosives (impulsive sounds) are most likely short term and mild to moderate, especially when sound sources are located more than a few kilometers away and when the animals are engaged in important biological behaviors, like feeding or calling at breeding sites. While impacts on humpback whale reproductive behaviors due to training and testing with sonar and other transducers may occur within the biologically important sub-areas, they are unlikely to rise to the level of significant under NEPA nor would they be sustained for a duration long enough that it caused an animal to be outside of normal daily variations in feeding, reproduction, resting, migration/movement, or social cohesion. Any TTS in the biologically important areas would be minor to moderate, from which the individual whale would fully recover quickly.

Since 2009, the Navy has provided NMFS with annual sonar reporting from December through April within the Humpback Whale Reporting Areas. When first established, the reporting was used by NMFS in order to clarify that these areas were areas of low use for mid-frequency active sonar and to determine if additional mitigation measures were needed. Through this and other reporting requirements, the areas with high densities of humpback whales have been identified by the Navy as

areas of low use of mid-frequency active sonar year-round. Most anti-submarine warfare activity historically occurs well offshore, away from areas where the highest densities of humpback whales are found during the winter months. If anti-submarine warfare activities were to occur in these areas when high concentrations of whales are present, current procedural mitigation measures that are employed would result in anti-submarine warfare activity training and testing activities being unrealistic and ineffective because exercise participants would be required to frequently power down or shut down sonar any time a whale was sighted within 1,000 yards.

The Navy recognizes the importance of the Humpback Whale Reproduction Area to the species and has balanced this with the Navy's need to train in areas that overlap with the biologically important areas. As discussed in Section K.3.1.2.1 (Navy Requirements for Area-Specific Training and Testing), reducing or limiting Navy training and testing in the Kauai and Niihau areas as part of geographic mitigation would not be practical from an operational perspective. This biologically important area overlaps with the Navy's training and testing instrumented ranges. Reducing or limiting Navy training and testing as part of geographic mitigation would reduce the effectiveness of training and testing on these ranges. Relocating the Pacific Missile Range Facility would result in extraordinary costs (millions of dollars), requiring an act from Congress. In addition, there are no other viable locations within the Hawaii Range Complex in which to relocate these ranges. This would also result in economic losses to the communities of Kauai through job losses. In addition, relocating these ranges in the Hawaii Range Complex would only transfer the effects of training and testing to other habitats or other species/stocks.

Navy training and testing events may also require vessels to move around Kauai and Niihau and through the channel separating the islands as an integral part of tactical scenarios. Training and testing realism would be hampered if pieces of the ocean environment and nearshore waters around the islands of Kauai and Niihau are unavailable for full tactical employment and scenario development consideration due to geographic mitigation. Operational forces must train in the same manner in which they operate while deployed. Failure to train in this manner risks deploying forces that will be employed by operational Commanders in a manner in which they are not ready, potential resulting in an unacceptable risk to the operational platform, its crew, and potentially to national security objectives.

Reducing or limiting Navy training and testing in the Southeast Oahu area is not likely to be effective in reducing or avoiding impacts given that the Navy does not routinely conduct activities that involve sonar or other transducers or explosives in this portion of the Humpback Whale Reproduction Area, and impacts to humpback whales occurring in this area are not anticipated. However, the Navy proposes to establish the following mitigation areas that overlap with some other portions of the Humpback Whale Reproduction Area in order to provide extra protections to this species during the reproduction season:

(1) Hawaii Island Mitigation Area – limits the amount of surface ship hull-mounted, mid-frequency active sonar (MF1) and dipping sonar (MF4) and restricts the use of explosives during testing, unit-level training and major training exercises year-round (Figure K.2-2).

(2) 4-Islands Region Mitigation Area – restricts surface ship hull-mounted mid-frequency active sonar (MF1) during training and testing in the mitigation area from November 15 through April 15. In addition, the Navy will restrict the use of explosives during training and testing in the 4-Island Regions Mitigation Area, year-round (Figure K.2-3).

See Section K.2.2 (Mitigation Areas to be Implemented) for more details on the above mitigation areas.

As discussed in Section K.3.1.5.1 (Navy Requirements for Area-Specific Training and Testing), due to the strategic importance of the Alenuihaha Channel, the Navy cannot completely prohibit the use of surface

ship hull-mounted mid-frequency active sonar or dipping sonar during training and testing; however, the Navy proposes to limit the amount of surface ship hull-mounted mid-frequency active sonar and dipping sonar used in the channel. The limited use of these sonar systems still allows naval forces to train in an environment that replicates the actual areas where they will be called to serve while likely reducing the number and level of impacts to humpback whales as well as for other species or stocks, including false killer whales, Cuvier and Blainville's beaked whales, pygmy killer whales, dwarf sperm whales, melon-headed whales, short-finned pilot whales and dolphin species occurring within the area without compromising military readiness.

The Navy determined that by establishing these mitigation areas, there was the potential to further avoid or reduce the number and level of impacts to humpback whales and other species or stocks occurring within the biologically important area without compromising military readiness by reducing the effectiveness of training and testing or decreasing the safety of personnel. Establishing any additional mitigation areas within other Humpback Whale Reproduction Areas would either be impractical to implement as they are adjacent to or within areas of high use and provide critical infrastructure or environmental conditions that are not easily replicated elsewhere, or are areas identified as low use by the Navy and adverse impacts to the population of humpback whales are not anticipated.

In addition to the mitigation areas proposed above and summarized in Section K.2.2 (Mitigation Areas to be Implemented), the Navy proposes to continue implementing procedural mitigation measures throughout the HSTT Study Area during training and testing activities that use active sonar and other transducers or explosives. These procedural mitigation measures prescribe reducing the sound level or powering off sonar systems or transducers if marine mammals are sighted within the mitigation zones (see Chapter 5, Mitigation, for details). Mitigation measures for activities using explosives includes observing a mitigation zone prior to and during the activity. Mysticetes, including humpback whales, are very large with typical dive durations lasting less than ten minutes and have conspicuous exhalation "blows" that can be seen many kilometers away. Therefore, it is highly likely that most mysticetes would be sighted and mitigation measures could be fully implemented if the animal enters the mitigation zone, greatly reducing potential impacts. Procedural mitigation measures are designed to provide protection to all marine mammal species year-round throughout the Study Area, including humpback whales during the reproductive season.

With respect to whether additional mitigation is warranted because of the potential for a vessel strike, as discussed in Section 2.3.3 (Standard Operating Procedures), Navy vessels operate differently from commercial vessels in ways important to preventing vessel strikes. Surface ships operated by or for the Navy have personnel assigned to stand watch at all times, day and night, when a ship or surfaced submarine is moving through the water (underway). A primary duty of personnel standing watch on surface ships is to detect and report all objects and disturbances sighted in the water that may indicate a threat to the vessel and its crew, such as debris, a periscope, surfaced submarine, or surface disturbance. Per vessel safety requirements, personnel standing watch also report any marine mammals sighted in the path of the vessel as a standard collision avoidance procedure.

As discussed in Section 3.0.3.3.4.1 (Vessels and In-Water Devices), large Navy ships typically operate at average speeds of between 10 and 15 knots, which for reference is slower than large commercial vessels, such as container ships that steam at approximately 24 knots during normal operations (Maloni et al., 2013). Operating vessels at speeds that are not optimal for fuel conservation or mission requirements would be unsustainable due to increased time on station and increased fuel consumption.

Each ship has a limited amount of time that it can be underway based on target service requirements and ship schedules. Ship schedules are driven largely by training cycles, scheduled maintenance periods, certification schedules, and deployment requirements. Because of the complex logistical considerations involved with maintaining ship schedules, the Navy does not have the flexibility to extend the amount of time that ships are underway, which would result from vessel speed restriction mitigation. If the Navy were to incorporate vessel speed restrictions into event planning for approximately 3–6 months out of the year, ships would be unable to meet all of their requirements during their limited time available to be underway. This would hold true even if the restrictions only applied to transits to and from training or testing event locations and not during the events themselves. Therefore, it would not be practicable for the Navy to implement speed restrictions within the San Diego Arc or other proposed mitigation areas.

As described in Section 5.3.4.1 (Vessel Movement), additional vessel speed restrictions would prevent vessel operators from gaining handling proficiency, would prevent the Navy from properly testing vessel capabilities, and would increase required the time on station during training or testing events to build skill proficiency or properly test vessel capabilities (which would significantly increase fuel consumption); therefore, the proposed mitigation would have significant impacts on the Navy's ability to train and test, and would prevent the Navy from meeting its mission requirements.

Implementing the Navy's Marine Species Awareness Training, beginning in 2006, along with other existing Navy mitigation measures intended to ensure that vessels avoid whales, correlates well with the reduction of strikes on large whales by Navy vessels in the last decade. The existing protection measures have been very effective in mitigating the potential for ship strikes both within the HSTT Study Area as well as worldwide. Navy vessels proceed at a safe speed at all times so that proper and effective action can be taken to avoid collision and so they can be stopped within a distance appropriate to the prevailing circumstances and conditions.

The Navy will continue to issue seasonal awareness notifications to inform vessels that humpback whales may be present in higher concentrations during the calving season throughout the Hawaii Range Complex. These notices provide a general heightened level of awareness, not only within a delimited biologically important area but also in the surrounding region where high densities of humpback whales are likely to be present.

K.3.2 Hawaii Island Dwarf Sperm Whale Small and Resident Population Area

An area with a small and resident population of dwarf sperm whales in waters off Hawaii Island was identified as a year-round biologically important area within the Hawaii Range Complex (Baird et al., 2015a) (Figure K.3-3). The area is approximately 2,674 km^2 in size, is located off the western coastline of Hawaii Island, and extends from south Kona to Kawaihae Bay. The area is approximately 42 km at its widest point and 85 km long and is somewhat triangular in shape. Water depth in the area ranges from approximately 10 m to over 2,600 m. As shown in Table K.1-1, and described in Section K.1.1.2, (Provisional 2015 Prohibited or Restricted Areas within HSTT Study Area), the Dwarf Sperm Whale Small and Resident Population Area overlaps with HSTT Settlement Areas 1-C, 1-D, 1-E, and 2-E.

K.3.2.1 General Biological Assessment

For a thorough description of the dwarf sperm whale species, see Section 3.7.2.3.6 (Sperm Whale [*Kogia breviceps*]). The dwarf sperm whale is protected under the MMPA and is not listed under the ESA. Dwarf sperm whales within the Pacific U.S. Exclusive Economic Zone are divided into two separate stocks: (1) the Hawaiian stock; and (2) the California, Oregon, and Washington stock (Carretta et al., 2017).

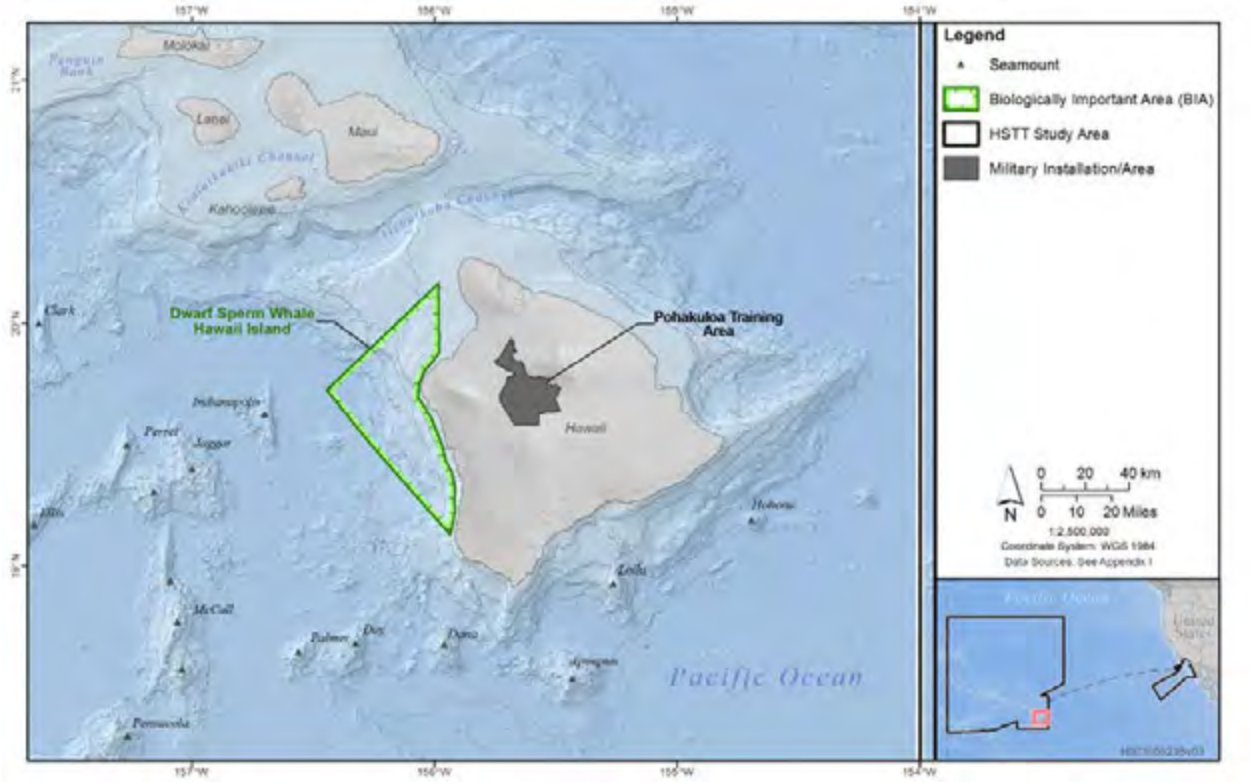


Figure K.3-3: Dwarf Sperm Whale Small and Resident Population Area off Hawaii Island

K.3.2.1.1 Biological Considerations Applicable to the Hawaii Island Dwarf Sperm Whale Small and Resident Population Area

During the 2002 NMFS survey of the Hawaiian Islands there were five dwarf sperm whale sightings and one sighting in the 2010 survey of the area (Barlow, 2006; Bradford et al., 2013). During small boat surveys between 2002 and 2012 in the Main Hawaiian Islands, this species was the fifth most frequently encountered species of odontocete (55 sightings) in waters shallower than 1,000 m, with a strong peak in the sighting rate where water depth was between 500 and 1,000 m (Baird, 2013; Oleson et al., 2013). These data suggest that the small and residential population may be using relatively nearshore habitat over the continental slope (Baird, 2013; Baird et al., 2015a).

Dwarf sperm whales have been observed near Niihau, Kauai, Oahu, Lanai, and Hawaii. Photo-identification of individuals off Hawaii Island since 2003 has provided evidence of long-term site fidelity, with a third of identified individuals being seen in more than one year, therefore suggesting the existence of an island-resident population (Baird, 2014; Baird et al., 2015a; Oleson et al., 2013). Pittman et al. (2016) reported on sightings of 184 dwarf sperm whales over 69 line transects conducted in both summer and winter from 1993 to 2014. The data were integrated from multiple sources and used to support spatially explicit predictive models of species occurrence. Dwarf sperm whales were only sighted in nearshore waters, with the largest number of sightings occurring off the west coast of the island of Hawaii. Efforts at tagging individual dwarf sperm whales off Hawaii are ongoing with the goal of further defining their movements and habitat in the region (Baird, 2014).

Genetic analysis has not been undertaken for this species because of insufficient sampling size. Due to a relatively small survey effort and the lack of tagging data and genetic analyses in areas of suitable habitat around the main Hawaiian Islands, it is not known whether additional resident populations exist

(Baird et al., 2015a). Only two dwarf sperm whales have been detected on the Navy's Pacific Missile Range Facility off the west coast of Kauai during small-boat survey efforts off Kauai and Niihau since 2003 (Baird et al., 2016b).

K.3.2.1.2 Stressor Analysis

K.3.2.1.2.1 Sonar and Other Transducers

As detailed in Section 3.7.3.1.2 (Impacts from Sonar and Other Transducers), dwarf sperm whales may be exposed to sound from sonar and other transducers used during training and testing activities throughout the year. Analysis for the entire Hawaii population estimates that exposures will result in behavioral reactions or TTS, and some exposures at levels that result in a few PTS are anticipated. Odontocetes would likely avoid sound levels that could cause higher levels of TTS (> 20 dB) or PTS. *Kogia spp.* that do experience hearing loss (i.e., TTS or PTS) from sonar sounds may have reduced ability to detect biologically important sounds until their hearing recovers. The limited amount of information available on *Kogia spp*. behavioral reactions to human disturbance suggests that these species may be more sensitive and avoid human activity, and presumably sound sources, at a longer range than most other odontocetes. This sensitivity may also make dwarf sperm whales less susceptible to hearing loss due to their avoidance of sound sources; therefore, it is likely that the quantitative acoustic modeling over-predicted hearing loss impacts (i.e., TTS and PTS) in dwarf sperm whales.

TTS would be recoverable and PTS would leave some residual hearing loss. During the period that a Kogia whale had hearing loss, biologically important sounds could be more difficult to detect or interpret. Odontocetes, including *Kogia spp.*, use echolocation clicks to find and capture prey. These echolocation clicks are at frequencies above a few tens of kHz in *Kogia spp.*; therefore, echolocation is unlikely to be affected by a threshold shift at lower frequencies and should not affect a Kogia whale's ability to locate prey or feed.

Research and observations on Kogia whale reactions to sound from sonar or other transducers are not available, although Kogia have been observed negatively reacting to vessels by diving and avoiding. Reactions, if any, could include alerting, startling, breaking off feeding dives and surfacing, diving or swimming away, changing vocalization, or showing no response at all. Animals disturbed while engaged in other activities such as feeding or reproductive behaviors may be more likely to ignore or tolerate the disturbance and continue their natural behavior patterns.

The small and resident population area is a very small portion of the Hawaii Range Complex; therefore, the population is likely to be exposed to sound from sonar or other transducers infrequently. While impacts on dwarf sperm whale natural behaviors due to training and testing with sonar and other transducers may occur within the small and resident population areas, they are unlikely to rise to the level of significant under NEPA nor would they be sustained for a duration long enough that it caused an animal to be outside of normal daily variations in feeding, reproduction, resting, migration/movement, or social cohesion. Any TTS in the biologically important areas would be minor to moderate, from which the individual would fully recover quickly. A small number of PTS may occur in the biologically important area, however the majority of PTS would occur outside of the area.

K.3.2.1.2.2 Explosives

As discussed in Section 3.7.3.2.2 (Impacts from Explosives), quantitative acoustic analysis estimated some PTS exposure from explosives for this species; however, the Navy does not conduct training or testing activities with explosives off the west coast of Hawaii Island where the dwarf sperm whale small and resident population area is located. Therefore, dwarf sperm whales in the area would not be exposed directly to sound or energy from explosives and impacts from training or testing with explosives would not be anticipated within the small and resident population area.

K.3.2.1.2.3 Vessel Strike

Odontocetes, including dwarf sperm whales that occur within the Study Area have varying patterns of occurrence and distribution which overlap with areas where vessel use associated with Navy training and testing activities would occur. As discussed in Section 3.7.3.4.1 (Impacts from Vessels and In-Water Devices) available literature suggests that due to their smaller body size, maneuverability, larger group sizes, and hearing capabilities, most small odontocetes are not likely to be struck by a Navy vessel. Most small whale and dolphin species have, however, at least occasionally suffered from strikes attributed to small boats and craft such as jet skis.

Generally, odontocetes are more capable of physically avoiding a vessel strike and since some species occur in large groups, they are more easily seen when they are closer to the water surface. Some studies established that marine mammals engage in avoidance behavior when surface vessels move toward them. It is not clear whether these responses are caused by the physical presence of a surface vessel, the underwater noise generated by the vessel, or an interaction between the two.

K.3.2.2 Hawaii Island Dwarf Sperm Whale Small and Resident Population Area, Settlement Areas 1-C, 1-D, 1-E, and 2-E

K.3.2.2.1 Navy Requirements for Area-Specific Training and Testing

Hawaii Island is unique in that it is provides the only capable air-to-ground range able to conduct carrier and expeditionary strike group activities near a channel with unfettered access to the open ocean. Open ocean areas support strike group maneuvering, using mid-frequency active sonar to prosecute (detect/track) a submarine in the vicinity of a high value unit (e.g., carrier) as aircraft execute strikes into Pohakuloa Training Area. The area around Hawaii Island is also used by surface ships with anti-submarine warfare capability to train for clearing the sea space of any submarine threat before Marines go ashore at Kawaihae Harbor (part of Rim of the Pacific and Marine Corps unit-level training scenarios). There are limited locations for amphibious landings in Hawaii due to existing environmental concerns. The west coast of Hawaii is one of the best locations for integrated joint marine amphibious operations because of its close proximity to the Pohakuloa Training Area which is the only range in the Hawaii Range Complex that supports ground force and aviation live-fire training.

The Hawaii Island Dwarf Sperm Whale Small and Resident Population Area is adjacent to waters approaching Kawaihae Harbor, the point of amphibious insertion for forces proceeding to the live-fire range at Pohakuloa Training Area.

Activities utilizing explosives, such as underwater detonations, bombing or torpedo exercises, are not conducted in the waters within the Dwarf Sperm Whale Small and Resident Population Area since it is not within a designated underwater training range or within Special Use Airspace, typically necessary for explosive usage.

K.3.2.3 Dwarf Sperm Whale Small and Resident Population Area Mitigation Assessment

The Navy has been training and testing in the area with the same basic systems for over 40 years and there is no evidence of any adverse impacts having occurred, and there are multiple lines of evidence demonstrating the population's high site fidelity to the area. The identified small and resident population area only takes up a very small portion of the Hawaii Range Complex, and sonar use in this area would be infrequent and typically only last for a short duration. Few, if any, Navy vessels are likely to be within the designated area using active mid-frequency sonar or other transducers. However, during the occasional use of mid-frequency active acoustic sonar during Undersea Warfare training, Independent Deployer Certification training, and Rim of the Pacific training, a small number of significant behavioral responses from dwarf sperm whales could occur within the small and resident population area. Predicted effects on individuals in the dwarf sperm whale resident population are expected to be behavioral in response to the use of sonar and other transducers (see Appendix E, Estimated Marine Mammal and Sea Turtle Impacts from Exposure to Acoustic and Explosive Stressors Under Navy Training and Testing Activities).

As presented in Section 3.7.3.1.2.2 (Impact Ranges for Sonar and Other Transducers), behavioral impacts from a mid-frequency sonar source on a dwarf sperm whale could, theoretically, occur at distances of tens of nautical miles. Therefore, individual animals within the biologically important area could potentially be affected by activities taking place outside of and at great distance from the boundaries of the biologically important area.

The current HSTT settlement agreement prohibits the use of in-water explosives within Areas 1-C, 1-D, 1-E, and 2-E which overlap with the Dwarf Sperm Whale Small and Resident Population Area. However, these areas are not historically used for explosives training and testing; therefore, dwarf sperm whales in the small and resident population area would not be exposed directly to sound or energy from explosives and impacts would not be anticipated.

The Navy balanced the need for the use of the area to meet training and testing requirements with the biological importance of the area for dwarf sperm whales and other species. The Navy proposes to implement a mitigation area that overlap portions of the Small and Resident Population Area. While this mitigation area is designed to provide additional protection for humpback whales, false killer whales and some beaked whale species, these measures will also reduce the number and level of impacts to these species and other species or stocks occurring within the area, including dwarf sperm whales, short-finned pilot whales, melon-headed whales, pantropical spotted dolphins, pygmy killer whales, and dolphins occurring within the area without compromising military readiness:

Hawaii Island Mitigation Area – limits the amount of surface ship hull-mounted, mid-frequency active sonar (MF1) and dipping sonar (MF4) and restricts the use of explosives during testing, unit-level training, and major training exercises year-round (Figure K.2-2).

See Section K.2.2 (Mitigation Areas to be Implemented) for more details on the above mitigation areas.

As described in Section 2.3.3 (Standard Operating Procedures), surface ships operated by or for the Navy, have personnel assigned to stand watch at all times, day and night, when a ship or surfaced submarine is moving through the water (underway). Mitigation measures described in Chapter 5 (Mitigation) are designed to avoid or reduce impacts to marine species and stocks throughout the Study Area. These measures would also limit the interaction between Navy vessels and odontocetes, further reducing the potential for vessel strikes in and outside of identified biologically important areas.

K.3.3 False Killer Whale Small and Resident Population Area: Main Hawaiian Island Insular Stock

Areas with a small and resident population of false killer whales (*Pseudorca crassidens*) in waters from Hawaii Island to Oahu were identified as a year-round biologically important area within the Hawaii Range Complex portion of the HSTT Study Area in Van Parijs (2015) and Baird et al. (2015a). The False Killer Whale Small and Resident Population Areas are shown on Figure K.3-4 with an overall area that is approximately 5,430 km^2 and varies from 5 to 55 km in width and 5 to 129 km in length. The water depth of the area is up to 2,622 m below sea level. As shown in Table K.1-1, and described in Section K.1.1.2, (Provisional 2015 Prohibited or Restricted Areas within HSTT Study Area), these small and resident population areas overlap in part with HSTT Settlement Areas 1-A through 1-E, 2-E, and 2-A through 2-D.

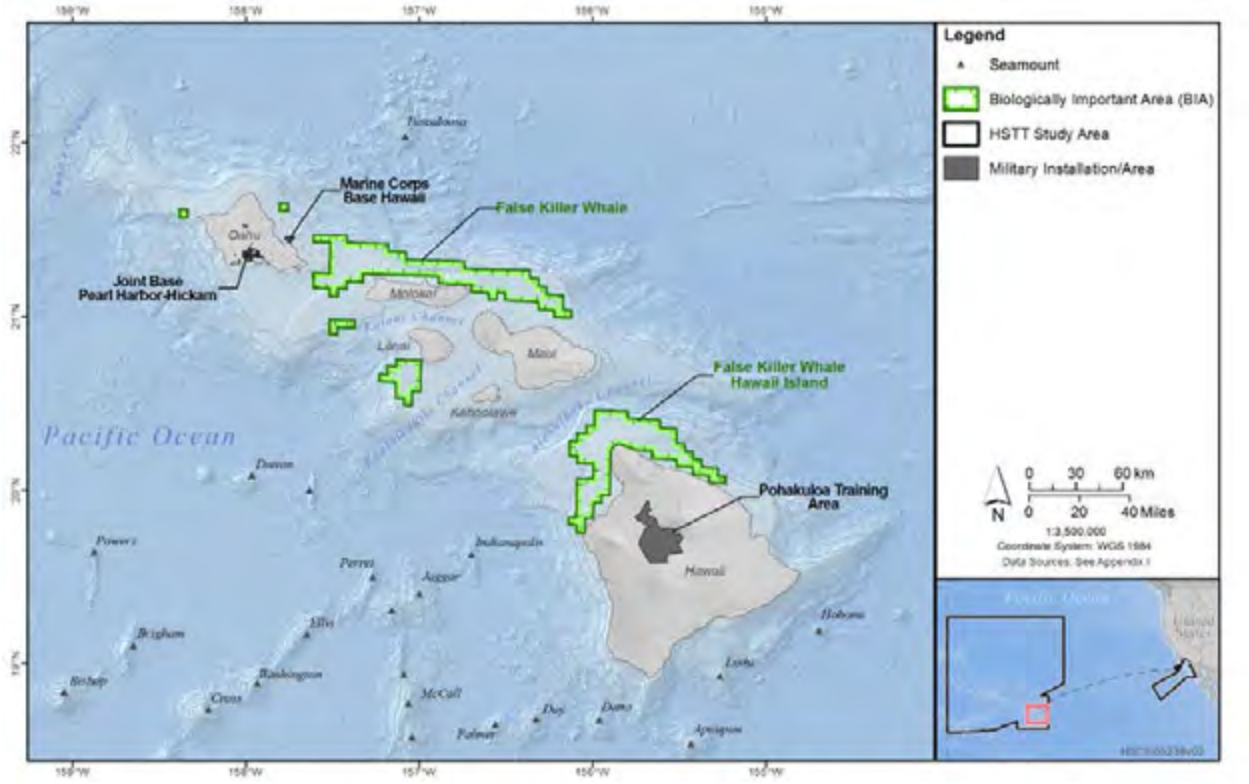


Figure K.3-4: False Killer Whale Small and Resident Population Area off Main Hawaiian Islands

K.3.3.1 General Biological Assessment

For a thorough description of the false killer whale species, see Section 3.7.2.2.7 (False Killer Whale [*Pseudorca crassidens]*; Main Hawaiian Islands Insular stock).

NMFS recognizes three false killer whale stocks within Hawaiian waters including a Northwestern Hawaiian Islands stock, a pelagic stock and the ESA-listed Main Hawaiian Islands insular stock (Carretta et al., 2016, Martien et al., 2014).

K.3.3.1.1 Biological Considerations Applicable to the Main Hawaiian Islands Insular Stock False Killer Whales Small and Resident Population Area

This small and resident population area was based upon known high-use areas for the ESA-listed Main Hawaiian Islands insular false killer whale. The Main Hawaiian Islands insular stock is estimated to be

151 individuals (Baird et al., 2015a; Carretta et al., 2017) with a minimum population estimate of 92 animals (Carretta et al., 2017). The stock boundary extends from west of Niihau to east of Hawaii Island and was revised in 2015 after the biologically important area was designated (Bradford & Lyman, 2015). The Main Hawaiian Islands stock boundary overlaps with both the pelagic and Northwestern Hawaiian Islands stocks. Main Hawaiian Islands insular false killer whales have been observed in three clusters; telemetry data is available for two of the three. A combination of telemetry data, home range estimates, and expert elicitation was used to qualitatively derive the revised stock boundary after qualitative derivation from telemetry-only data provided unsatisfactory results (Bradford & Lyman, 2015; Carretta et al., 2017). This process appears to illustrate that the stock boundaries are still somewhat in flux, and may continue to shift as more data become available.

Results from visual surveys and satellite tagging were used to delineate several high-use areas within this population's known range (Baird et al., 2012; Baird et al., 2015c). Grid cells with density of satellite tag locations (from 22 individuals) greater than one standard deviation above the mean were considered "high-use areas" and mapped accordingly to identify the biologically important area (Baird et al., 2012; Baird et al., 2015c). Since survey effort was lacking for the spring season, sample size is small and there is a lack of tagging data from one of the three social groups. It is unknown whether additional high-use areas or resident populations exist.

As defined, "Small and Resident" includes all life functions, however, NMFS acknowledged that there is considerable uncertainty surrounding all aspects of their biology, abundance, trends in abundance and threats (Oleson et al., 2010). The NMFS-assembled Take Reduction Team considered the effects of potential threats, and included analysis of anthropogenic sound including military sonar and seismic exploration. However, NMFS determination was that the largest threats to the population were small population size, exposure to environmental contaminants, competition for food with commercial fisheries, and hooking, entanglement, or intentional harm by fishers, rather than sound in the water (Oleson et al., 2010). Overall, the Take Reduction Team ranked threats related to small population size and hooking, entanglement, or intentional harm by fishers as the highest threats to the Hawaiian insular false killer whales and NMFS closed a large portion of the stocks' range to longline fishing in 2012 (National Marine Fisheries Service, 2012). NMFS is still gathering data to conduct a quantitative assessment as to whether the closure has had a positive effect on the stock (Carretta et al., 2017).

Limitations inherent in satellite tags have resulted in data insufficient to determine any behavioral characteristics associated with the areas most used by this stock compared to other areas of their range. Satellite tracking data suggest that individuals move throughout most of the range of the population rapidly and semi-regularly (Baird et al., 2010b; Baird et al., 2012) and there is likely no specific breeding area within their range. The available evidence also suggests that false killer whales feed daily, year-round, throughout their range (Baird et al. (2012). Researchers have been unable to directly assess feeding within high density areas (Baird et al., 2012).

NMFS convened a recovery planning workshop in October 2016 where current status, threats, and recovery goals for the main Hawaiian Islands insular false killer whale were discussed. Attendees included the Take Reduction Team, non-governmental organizations, and invited contributors including two representatives from the U.S. Navy, Pacific Fleet. NMFS has provided a summary of the workshop proceedings, which indicates that fisheries interactions are considered the highest threat to the stock, with the effects of contaminants and anthropogenic noise needing more research and monitoring (National Marine Fisheries Service, 2017). Recovery planning is ongoing, and a final recovery plan is anticipated in two to three years. Critical habitat for this distinct population segment was designated in

July 2018 by designating waters from the 45-meter (m) depth contour to the 3,200 m depth contour around the main Hawaiian Islands from Niihau east to Hawaii, pursuant to section 4 of the Endangered Species Act. Fourteen areas were excluded from the designation (under Section 4(b)(2) and 4(a)(3) of the ESA, as shown in Figure 3.7), 13 of which were requested by the Navy. NMFS determined that benefits of exclusion outweigh the benefits of inclusion, and exclusion will not result in the extinction of the species. It was also determined that some of these areas were areas of low-use and lower travelled areas as main Hawaiian Island insular false killer whale habitat, were areas where the Department of Defense maintains control of the area, or were areas unique for the Department of Defense that provide specific opportunities for training and testing. The Navy is aware that underwater sound is one of the essential features of the critical habitat necessary for the conservation and management of this stock. The Navy is consulting with NMFS under section 7 of the ESA to ensure its activities are not likely to jeopardize this and other ESA-listed species. Navy activities are typically conducted within discrete locations, generally over brief periods, and are less likely to have lasting effects on the overall characteristics of features essential to conservation. The Proposed Action is not expected to degrade the habitat and ultimately prevent insular false killer whales from benefitting from this habitat. The U.S. Navy has been funding monitoring in the Main Hawaiian Islands under the Pacific Fleet Marine Species Monitoring Program since the mid-2000s (see www.marinespeciesmonitoring.us for detailed methodology and results). Since 2012, monitoring in the Hawaii Range Complex has occurred primarily off Kauai in order to utilize the instrumented hydrophone range at the Pacific Missile Range Facility for passive acoustic monitoring and analysis of marine mammal exposure and response to Navy training and testing. The Pacific Missile Range Facility is used for a variety of training and testing activities, including anti-submarine warfare training, which requires use of hull-mounted mid-frequency active sonar. Since 2007, several days of marine mammal acoustic data have been obtained and archived from the Pacific Missile Range Facility hydrophones each month for future analysis. The Submarine Command Course occurs on the range twice a year and utilizes mid-frequency active sonar so it was chosen by U.S. Pacific Fleet as the focal training event for monitoring. Additional (classified) data have been archived from the Submarine Command Courses since 2011 for post-exercise analysis of marine mammal exposure and response.

Non-systematic boat-based visual surveys have been a part of the Navy's monitoring program since 2012, as discussed in detail below. They have occurred primarily off the Pacific Missile Range Facility in order to utilize acoustic detection and localizations from the instrumented range to direct the at-sea part of the monitoring team to priority species for satellite tag deployment and enable opportunistic behavioral exposure and response analysis to occur. The surveys are scheduled just prior to the Submarine Command Course to maximize the possibility of tagging animals that may stay in close proximity to the range during the training event. Photos and biopsy samples are also collected to feed analysis of occurrence, population structure and habitat use of marine mammals in the archipelago.

False killer whales are one of the priority species for Navy monitoring in Hawaii and satellite tags were deployed on seven individuals off Kauai between 2012 and 2015 (Baird et al., 2014b; Baird et al., 2015c; Baird et al., 2016a). Tag attachment ranged from 15 to 108 days. Two animals were from the Main Hawaiian Islands insular stock and five from the North West Hawaiian Insular stock. Location data from a false killer whale tagged off Kauai in 2013 showed a very different pattern in spatial use than had previously been documented for false killer whales from the Northwest Hawaiian Islands stock (Baird et al., 2014a). Prior to this effort, false killer whales from this population had been tagged on two different occasions, off Nihoa in 2010 (Baird et al., 2013a), and off Kauai in June 2012 (Baird et al., 2013c). The two previous tagging locations were of individuals from at least two different social groups, although

movement patterns were generally similar, with broad scale movements from Kauai/Nihoa to Gardner Pinnacles (Baird et al., 2013b; Baird et al., 2013c).

The individual tagged in July 2013 was from the same group as at least two of the individuals tagged in July 2012 but in contrast to the movements of the 2012 tag tracks, it remained associated with the Kauai and Niihau area for the entire 21 days post-tagging. This includes before, during, and after the Submarine Command Course held in August 2013; it passed through the Pacific Missile Range Facility range twice during the five-day training event. The tag track was compared with mid-frequency acoustic sonar usage to estimate received levels of sonar as well as ascertain any behavioral response to the sonar (Baird et al., 2014a; Baird et al., 2016b), the results of which are discussed in detail in the Stressor Analysis sections below.

The visual, tagging and biopsy data from Navy monitoring has been shared with NMFS to inform their understanding of distribution of the three stocks in the Hawaiian Islands. Simultaneously, analysis of behavior and habitat use relative to Navy training and testing is ongoing under the monitoring program. The Navy monitoring data were not collected in the biologically important area; however, some of the individuals were from the Main Hawaiian Islands insular stock. The Navy-funded data contributes to the scientific community and the Take Reduction Team's overall knowledge on this species and stock. Ongoing data collection illustrates the need for a larger sample size to more precisely assess habitat use and any importance of the biologically important area for life functions such as feeding and breeding.

K.3.3.1.2 Stressor Analysis

K.3.3.1.2.1 Sonar and Other Transducers

As detailed in Section 3.7.3.1.2 (Impacts from Sonar and Other Transducers), Main Hawaiian Islands insular false killer whales may be exposed to sound from sonar and other transducers used during training and testing activities throughout the year. Analysis for the entire Hawaii population estimates that all exposures result in behavioral reactions or TTS and no exposures at levels of PTS are anticipated. Any TTS in the biologically important areas would be minor to moderate, from which the individual whale would fully recover quickly.

This identified small and resident population area is mostly located within shallow, nearshore waters where the Navy does not typically conduct activities that involve sonar or other transducers, especially more intense activities such as anti-submarine warfare activities or major training events. However, sound from sonar or other transducers could still expose animals within the false killer whale small and resident population area to acoustic stressors and some impacts on behavior could occur. As discussed in Section 3.7.3.1.2 (Impacts from Sonar and Other Transducers), false killer whale reactions to sonar are most likely short-term and mild to moderate, especially when sound sources are located more than a few kilometers away or when the animals are engaged in important biological behaviors. Evidence indicates false killer whales do not significantly alter their behavior or abandon an area in response to sonar exposure (Baird et al., 2013b; Baird et al., 2014a)

Although the Navy proposes to continue use of mid-frequency active sonar throughout the Hawaii Range Complex under the Proposed Action, it is likely to be used more frequently and with more short-duration intensity by surface ships in specific locations like the Pacific Missile Range or further offshore in areas that do not overlap with the biologically important area. Some major training exercises, such as Rim of the Pacific and Undersea Warfare Exercise, use the Alenuihaha Channel for anti-submarine warfare and may transit through the biologically important area. Rim of the Pacific typically only occurs

every two years, Undersea Warfare Exercise is only one to three times per year. The Alenuihaha channel is not routinely used other than during these training exercises.

Navy monitoring in the Hawaii Range Complex has resulted in tags being deployed on seven false killer whales prior to the Submarine Command Course and contributed valuable information on the occurrence and movements of false killer whales. Unfortunately, the movements of only one individual in the Pacific Missile Range Complex Facility allowed for detailed analysis of exposure and response. The biologically important areas identified for false killer whales do not overlap with the instrumented ranges off of the Pacific Missile Range Facility. The Navy is unaware of any exposure or response data for false killer whales from within the designated biologically important area. Therefore, the response of this false killer whale and one tagged in the Southern California Range Complex by DeRuiter et al. (2013b) are used as species-specific examples of how false killer whales would be expected to respond to acoustic stressors. An animal's response to sonar in the biologically important areas and the rest of the Hawaii Range Complex would be expected to be the same as the Pacific Missile Range Facility example.

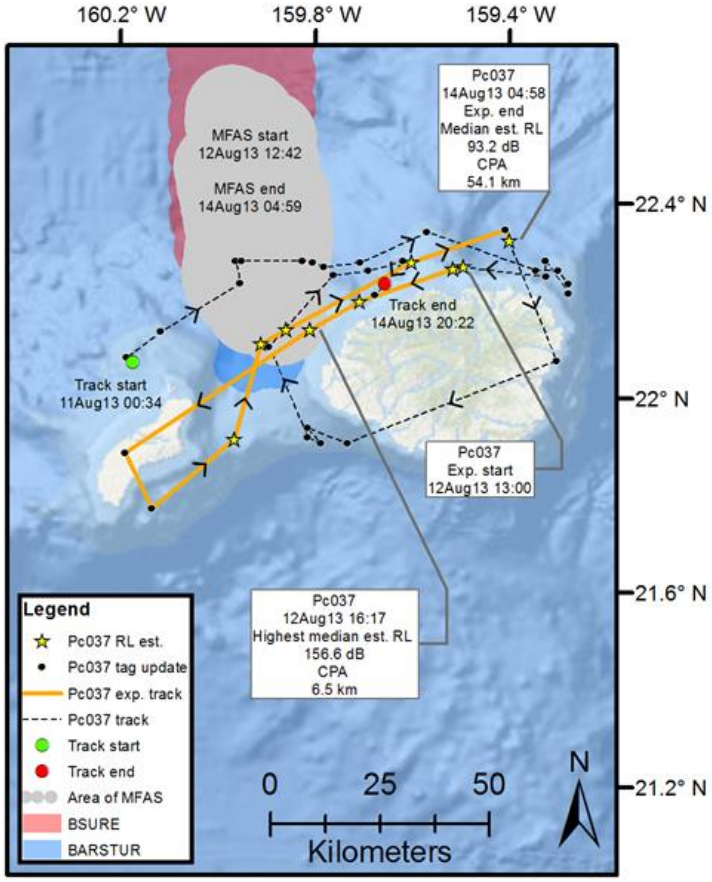
This satellite tag was deployed on the false killer whale in 2013 off Kauai (Baird et al., 2014a; Baird et al., 2016b). The tag transmitted for 21 days, allowing the researchers to track animal movements over a period before, during, and after the Submarine Command Course. The tagged individual remained associated with the island before, during, and after the Submarine Command Course held in August 2013 (Baird et al., 2014a).

The mid-frequency acoustic sonar transmission times (determined directly using sounds received on the range hydrophones), ship positions at time of transmissions, and animal locations (determined from satellite tag positions) allowed estimation of the sound pressure levels the tagged animals were exposed to using a propagation model. More detail on analysis methodology can be found in Manzano-Roth et al. (2013) and Baird et al. (2014a).

In this example, the false killer whale passed through the range twice, receiving an estimated median received level of 156 dB re 1 µPa with a maximum estimated received level of 188 dB re1 µPa on August 12 (Baird et al., 2016b). Despite this exposure, the animal remained in the vicinity for two more days, and passed through the Submarine Command Course again, continuing to be exposed to mid-frequency acoustic sonar. This animal's lack of observable behavioral response to mid-frequency active sonar is consistent with bottlenose dolphins, rough-toothed dolphins, and pilot whales for which analysis of this kind has also been conducted from Pacific Missile Range Facility data (Baird et al., 2014a; Baird et al., 2014b; Baird et al., 2016b).

Behavioral response studies are being or have been conducted at three U.S. Navy instrumented ranges (the Pacific Missile Range Facility in the Hawaii Range Complex, the Atlantic Undersea Test and Evaluation Center in the Bahamas, and the Southern California Anti-Submarine Warfare Range in the Southern California Range Complex). Methodologies differ in all three (e.g., controlled exposure, tag type); however, results consistently suggest that behavioral response is context specific. DeRuiter et al. (2013a) found that D-tag sound recordings from a false killer whale in the Southern California Range Complex revealed seventy-seven instances in which, just after exposure to the mid-frequency active sonar signal, false killer whales produced whistles that sounded similar to mid-frequency sonar-like signals to human listeners. Furthermore, overall whistle rate and production rate for the most mid-frequency sonar-like whistles decreased with time since the last mid-frequency active sonar reception (DeRuiter et al., 2013a). The impact of mid-frequency acoustic sonar exposure on behaviors such as

feeding and reproduction on this species is not well characterized. However, these two examples–one using satellite tags and one using acoustic tags–represent the best available data for this species with regard to response to mid-frequency acoustic sonar.



Source: Baird et al. (2017).

Figure K.3-5: False Killer Whale Tracks off Kauai, August 12–14, 2013

Note: False killer whale tag track and analysis results illustrating (1) the area of mid-frequency active sonar; (2) the whale's relative horizontal movements from 12–14 August 2013; and (3) the median estimated received levels when the sonar was closest to the animal, resulting in the highest estimated received level, and at the end of the exposure when the sonar ceased active transmission.

The results of the behavioral response studies in Southern California and Hawaii suggest that false killer whales do not have an observable behavioral response to mid-frequency active sonar at an estimated maximum received level of 188 dB re1 µPa. A received level of 188 dB re 1 µPa is greater than the received level predicted to elicit a behavioral response from false killer whales, suggesting that either there was some type of unobserved response or that, contrary to predictions, the animals were not affected by the sound (Baird et al., 2016b; U.S. Department of the Navy, 2017a).

The main Hawaiian Islands insular false killer whale stock is ESA-listed, and it is believed that biological removal of just one individual (Carretta et al., 2017) may adversely affect the ability of this stock to recover. However, exposure of false killer whales to active sonar or other transducers would not result in mortality or the removal of any individuals from the main Hawaiian Islands insular stock or any other stock of false killer whales throughout the Study Area.

Monitoring and research data, albeit with small sample sizes, suggests that individual false killer whales do not respond to U.S. Navy mid-frequency active sonar in such a way that would reduce their use of a geographic area. These identified small and resident population areas are mostly located within shallow, nearshore waters where the Navy does not typically conduct activities that involve sonar or other transducers, especially more intense activities such as anti-submarine warfare activities or major training events. While impacts on false killer whales' natural behaviors due to training and testing with sonar and other transducers may occur within the small and resident population areas, they are unlikely to rise to the level of significant under NEPA nor would they be sustained for a duration long enough that it caused an animal to be outside of normal daily variations in feeding, reproduction, resting, migration/movement, or social cohesion.

K.3.3.1.2.2 Explosives

As indicated in Section 3.7.3.2.2 (Impacts from Explosives) only TTS for this species is estimated due to exposure to the use of explosives during training and testing. Any TTS in the biologically important areas would be minor to moderate, from which the individual whale would fully recover quickly.

Much of the high use areas for main Hawaiian Islands insular false killer whale are from the 45 m to 3200 m depth contours and the Navy typically conducts underwater detonations shallower than 45 m and other explosive activities further offshore than the 3200 m contour. Historical data suggests that explosive events are most likely to be scheduled at Puuloa Underwater Training Range , W-188, or KAPU HOT located in W-192 south of Oahu (Figure K.3-6) for ease of scheduling, safety, availability of instrumentation, and airspace concerns. Standard mitigation is implemented during explosives training and testing which includes use of lookouts and mitigation zones sized based on activity making it unlikely that an animal at the surface would be affected.

While the Puuloa Underwater Training Range and KAPU HOT are entirely within the stock boundary of the main Hawaiian Islands insular false killer whales, as is the inshore portion of W-188 (Figure K.3-6), they do not overlap with the biologically important areas for the false killer whale small and resident populations; therefore, explosives training and testing is not likely to occur in the biologically important areas. However, sound from explosives could still expose animals within the high use areas and the false killer whale small and resident population area identified by Baird et al (2015a) and some impacts on behavior could occur.

Although Navy monitoring data has added to the scientific base of knowledge on species/stock occurrence, habitat use, and genetics, the Navy is not aware of any research or monitoring data that specifically evaluates false killer whale responses to explosives. However, a general discussion of the effects of explosives and blast trauma to marine mammals is discussed in Section 3.7.3.2.2 (Impacts from Explosives).

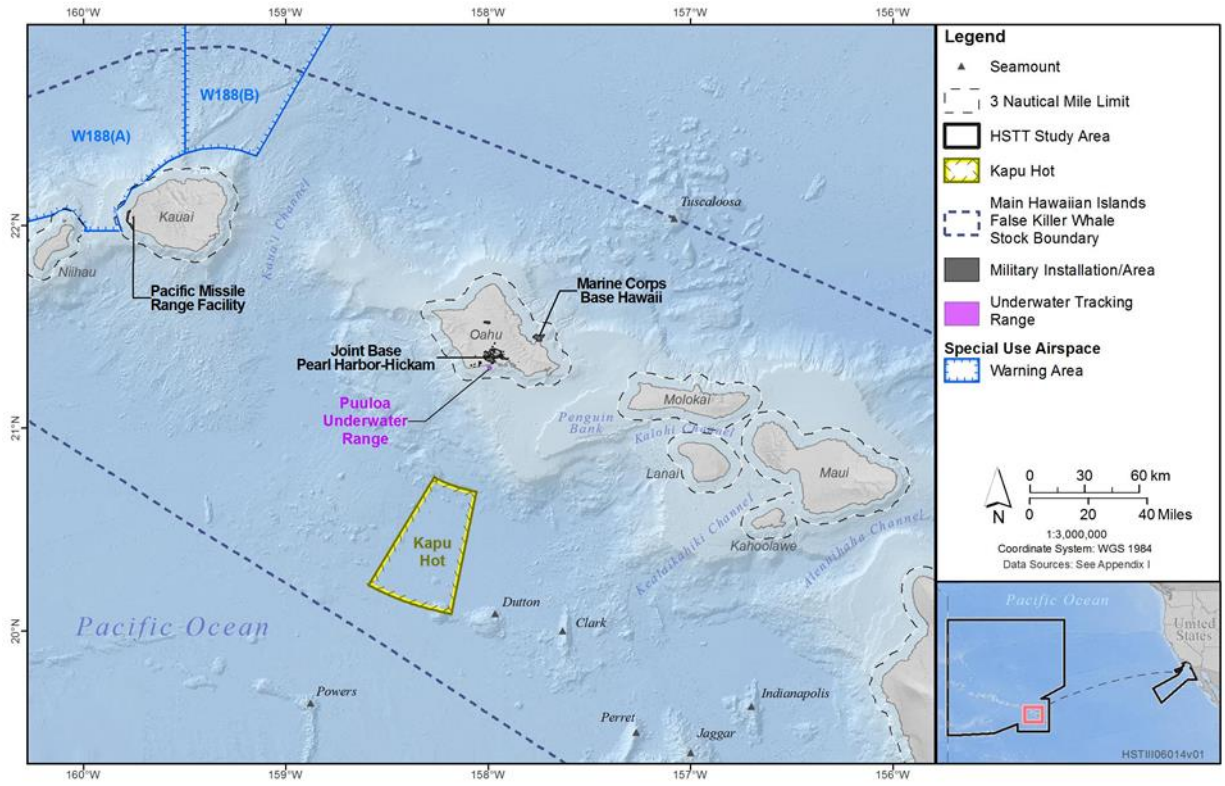


Figure K.3-6: Boundary of Main Hawaiian Islands Insular False Killer Whale Stock Relative to Areas in Hawaii Range Complex Where Explosives Training Typically Occurs

K.3.3.1.2.3 Vessel Strike

Odontocetes that occur within the Study Area have varying patterns of occurrence and distribution which overlap with areas where vessel use associated with Navy training and testing activities would occur. As discussed in Section 3.7.3.4.1 (Impacts from Vessels and In-Water Devices), in general, odontocetes move quickly and seem to be less vulnerable to vessel strikes than other cetaceans; however, most small whale and dolphin species have at least occasionally suffered from strikes attributed to small boats and craft such as jet skis. Available literature suggests that due to their smaller body size, maneuverability, larger group sizes, and hearing capabilities, most small odontocetes are not likely to be struck by a Navy vessel. Generally, odontocetes are more capable of physically avoiding a vessel strike and since some species occur in large groups, they are more easily seen when they are closer to the water surface.

Some studies established that marine mammals engage in avoidance behavior when surface vessels move toward them. It is not clear whether these responses are caused by the physical presence of a surface vessel, the underwater noise generated by the vessel, or the combination of interactions between the two.

K.3.3.1.3 North and West of Hawaii Island False Killer Whale Small and Resident Population Area, Settlement Areas 1-A through 1-E, 2-E, and 2-A through 2-D

The North and west of Hawaii Island False Killer Whale Small and Resident Population Area overlaps with Alenuihaha Channel and Settlement Areas 1-A through 1-E, 2-E, and 2-A through 2-D, and includes waters just offshore from Kawaihae Harbor on the northwest coast of the island.

K.3.3.1.4 Navy Requirements for Area-Specific Training and Testing

The Alenuihaha Channel, as well as the waters north and west of Hawaii Island, provides a unique training capability that does not exist elsewhere in the Hawaii Range Complex. The Alenuihaha Channel is an ideal location for strait transits using limited mid-frequency active sonar during training. The Alenuihaha Channel is an actual channel that provides a vital and realistic analog for similar straits or restricted maneuvering areas where the Navy operates worldwide, such as the East or South China seas. For example, transit training in the Alenuihaha Channel replicates these types of strait environments that meet the Navy's requirement to deploy Naval forces to ensure the free flow of commerce and the freedom of navigation by combatting piracy or mine threats. Naval forces are required to train to counter a submarine threat before deployment, to ensure such forces obtain the required proficiency to conduct anti-submarine warfare in a controlled and observed environment prior to deployment to international straits across the globe, where operational Commanders require Naval forces to be able to conduct a range of military operations, including anti-submarine warfare. This required proficiency cannot be replicated by simulation and is most effectively obtained when conducted in a strait. Commanding Officers cannot be expected to effectively conduct such operations in a deployed environment if the first time they encounter a submarine in a strait is in a deployed setting. There are few geographic areas that enable forces to do this type of training outside of the HSTT Study Area.

The ability of an aircraft carrier to defend itself from submarine attack with all available assets while conducting straits transits is critical to its survival in forward operating areas. The channel is located outside most of the civilian air traffic corridors approaching the Honolulu International Airport which is necessary to safely de-conflict with civilian air traffic.

While there are other channels within the Hawaii Range Complex used for strait transit training and anti-submarine warfare training, none provide the important attributes of the Alenuihaha Channel. The Alenuihaha Channel's proximity to the Pohakuloa Training Area allows for realistic training and reduces time and fuel costs between these training areas. The channel between Niihau and Kauai is also acceptable from a training perspective, but this would add at least two days of transit during each Under Sea Warfare training exercise (time required to move through a different channel and reposition to operating areas near Pohakuloa Training Area). The Kaiwi Channel between Oahu and Molokai is also acceptable for some mid-frequency active sonar training, but it is also a significant civilian air corridor, and raises safety concerns for anti-submarine warfare aircraft flying in that channel. In addition, the channel between Nihau and Kauai is proximate to the Pacific Missile Range Facility instrumented range which would result in problems de-conflicting multiple activities and hazardous operations, raising safety concerns. For these reasons, Alenuihaha Channel is still the most suitable for anti-submarine warfare training during certain training scenarios. The channel between Oahu and Molokai is located under a significant civilian air corridor, and its use would raise safety concerns for anti-submarine warfare aircraft flying in that channel during major training events.

The North and West of Hawaii Island False Killer Whale Small and Resident Population Area is adjacent to waters approaching Kawaihae Harbor, the point of amphibious insertion for forces proceeding to the range at Pohakuloa Training Area. As an air-to-ground range, Pohakuloa Training Area supports carrier strike group activities near a channel and near large open water areas for strike group maneuvering and submarine activities. Mid-frequency active sonar conducted to support strike maneuver and protect high value units (e.g., carrier) as aircraft go to strike at Pohakuloa Training Area is vital.

Carrier strike group training can include a full spectrum of the force – various ships, submarines, aircraft, and Marine Corps forces. Carrier strike group training allows for complex command, control operational coordination, and logistics functions designed to prepare forces for deployment. Access to both the Alenuihaha Channel and the waters west of Kawaihae Harbor is also vital for a broad spectrum of naval and amphibious training. The west coast of the island of Hawaii is one of the best locations for integrated joint marine amphibious operations because of its close proximity to the Pohakuloa Training Area which is the only range in the Hawaii Range Complex that supports ground force and aviation live-fire training. These areas provide a unique and irreplaceable capability within the Hawaii Range Complex that allows naval forces to conduct realistic, integrated training in an environment that replicates the actual areas where they will be called to serve.

Activities utilizing in-water explosives, such as bombing torpedo exercises, are not conducted in the waters within the False Killer Whale Small and Resident Population Area. The area is not within controlled airspace where the Navy can monitor by aircraft as required to support the use of large explosives.

K.3.3.1.5 North and West of Hawaii Island False Killer Whale Small and Resident Population Area, Settlement Areas 1-A through 1-E, 2-E, and 2-A through 2-D Mitigation Considerations

As noted above, the Alenuihaha Channel and the waters west of Kawaihae Harbor are used for a broad spectrum of naval and amphibious training. Excessively limiting or restricting mid-frequency active sonar training in the Alenuihaha Channel could force the relocation of portions of Undersea Warfare training, Independent Deployer Certification training, Rim of the Pacific, and unit level training exercises to other channels in the Hawaiian OPAREAs further from the Pohakuloa Training Area range. Undersea Warfare certification training occurs up to three times per year, Rim of the Pacific occurs once every two years, and Independent Deployer Certification training occurs once per year. While the North and West of Hawaii Island False Killer Whale Small and Resident Population Area is not considered an area of high use for mid-frequency active sonar during these major training exercises, segmenting the scenarios within each of these training events over time and space would result in an unacceptable loss of training realism, degrade the training and would erode strike group readiness.

Explosives are not used in this area and therefore no impacts are anticipated due to that stressor. Through annual reporting to NMFS since 2009, this area has been identified by the Navy as an area of low use of mid-frequency active sonar year-round with the exception of occasional use during Undersea Warfare training, Independent Deployer Certification training, and Rim of the Pacific training. Animals within the False Killer Whale Small and Resident Population Area could be exposed to sound from sonar or other transducers and some behavioral or temporary impacts could occur from the occasional use of mid-frequency active sonar during those events. While significant long-term impacts on main Hawaiian Island insular false killer whales from training and testing with sonar and other transducers are unlikely to occur within the Small and Resident Population Area, the Navy considered the likelihood that additional measures would further reduce impacts on this species and their habitat and whether a mitigation area measure would be practicable to implement, given their critically endangered status.

The Navy balanced the need for the use of the area to meet training and testing requirements with the biological importance of the area for false killer whales and other species. The Navy proposes to implement mitigation areas that overlap portions of the North and West of Hawaii Island False Killer Whale Small and Resident Population Area. These mitigation areas are designed to provide additional protection for humpback whales, false killer whales and some beaked whale species, and will also

reduce the number and level of impacts for other species or stocks, including pygmy killer whales, dwarf sperm whales, melon-headed whales, short-finned pilot whales and dolphin species occurring within the area without compromising military readiness. See Section K.2.2 (Mitigation Areas to be Implemented) for more details on the above mitigation areas.

K.3.3.1.6 4-Islands Region False Killer Whale Small and Resident Population Area, Settlement Areas 1-A through 1-E, 2-E, and 2-A through 2-D

The 4-Islands Region False Killer Whale Small and Resident Population Area overlaps partly with Settlement Area 2-B and fully overlaps with Settlement Areas 1-A through 1-E, 2-E, and 2-A through 2-D, This False Killer Whale Small and Resident Population Area also overlap with Kaiwi Channel, the channel between Molokai and Oahu and the water space adjacent to the northern portion of the Pailolo Channel between Molokai and Maui.

K.3.3.1.7 Navy Requirements for Area Specific Training and Testing

The 4-Islands Region provides an environment for anti-submarine warfare search, tracking and avoidance of opposing anti-submarine warfare forces. The bathymetry provides unique attributes and unmatched opportunity to train in searching for submarines in shallow water. Littoral training allows units to continue to deploy improved sensors or tactics in littoral waters. In the Hawaii portion of the HSTT Study Area specifically, anti-submarine warfare training in shallow water is vitally important to the Navy since diesel submarines typically hide in that extremely noisy and complex marine environment (Arabian Gulf, Strait of Malacca, Sea of Japan, and the Yellow Sea all contain water less than 200 m deep). There is no other area in this portion of the HSTT Study Area with the bathymetry and sound propagation analog to seas where Navy conducts real operations that this training could relocate to. The Navy cannot conduct realistic shallow water training exercises without training in and around the 4-Islands Region. In addition, this area includes unique shallow water training opportunities for unit-level training, including opportunity to practice operations in littoral areas that are both shallow, and navigationally constrained, and in close proximity to deeper open ocean environments.

The areas of deep water located off the northwest coast of Kahoolawe provide unique and necessary bathymetry to support submarine post-major maintenance testing and certification. The area is also used by submarine crews during Submarine Command Course certification training on anti-submarine warfare and surface warfare missions. The mine warfare range off Kahoolawe contains multiple bottom and tethered mine shapes in shallow water. Although the area is not instrumented in the way that the Pacific Missile Range Facility is, the area provides submerged submarine positioning with Submerged Acoustic Navigation System buoys.

While submarines do not typically use mid-frequency active sonar, relying primarily on passive sonar (listening mode) to avoid detection from adversaries, submarines are required to train in counter detection tactics, techniques and procedures against threat surface vessels, airborne anti-submarine warfare units and other threat submarines using mid-frequency active sonar as part of both their prospective Commanding Officers qualification course and pre-deployment certification. The ability for surface vessels and air assets to simulate opposing forces, using use mid-frequency active sonar when training with submarines, is critical to submarine crew training for deployed and combat operations. Surface warfare training is designed to support unit-level training requirements and group cross-platform events in 28 mission areas for surface ship certification prior to deployment. The Required Operational Capabilities and Required Operational Environment guidance outlines anti-submarine warfare areas specifically requiring crews to accomplish 58 major tasks to support both deep and

shallow water anti-submarine training activities, across multiple domains of the open ocean and littoral areas, while conducting unit and group self-defense training across multiple platforms and defensive operations. Submarine Command Course training is conducted twice a year in Hawaii, in February and August (with the intermittent use of active sonar over a three-to-five-day period use per event). Submarine Command Course training is a Medium Coordinated Anti-Submarine Warfare Training exercise (see Table 2.3-2).

The 4-Islands Region is used for Submarine Command Course training as a location to train prospective Submarine Commanding Officers to operate in shallow water. Adjacent to the designated biologically important area, the Kaiwi, Pailolo, and Kalohi Channels are used to simulate strait transits and provide realistic shallow water environments for qualification that prospective Commanding Officers would experience while deployed. For example, conducting shallow water anti-submarine warfare training in a deep water environment while simulating fathometer readings would develop bad habit patterns of ignoring the critical depth aspect of the training, and in a real world situation, those readings may possibly be ignored as well, thereby jeopardizing safety and survival of the ship and crew. Training in actual shallow water conditions is mandatory to develop proper crew coordination and tactics, techniques and procedures to ensure mission success. Additionally, training in the shallow water environment is essential for crews to experience the effect of bottom topography, (upslope and downslope) on sonar transmission and returns for detecting threat targets in different advantageous positions. Surface vessels and air assets work with submarines in that area while conducting submarine Commanding Officer's training scenarios that include extended shallow water operations at periscope depth, general surveillance missions in shallow water, shallow water weapons employment, close to shore navigation, shallow water minefield operations, and shallow water ship control.

Additionally, the 4-Islands Region possesses other attributes which make it an important area for anti-submarine and mine warfare training:

- Adjacent to the designated biologically important area south of Lanai, the Kahoolawe Minefield is utilized by submarine crews and during Submarine Commander's Course certification training for mine counter measure training and certification. Kaho'olawe Minefield is used throughout the year to support mine counter measure training. Mine counter measure training is typically less than one day and does not involve the use of mid-frequency active sonar by the submarine.
- Expeditionary warfare training is conducted on the west coast of Maui — no explosives are used — which includes swimmers getting to a beach with small boats where access is limited.
- Littoral Combat Ship training and certification of the anti-submarine and mine warfare mission modules may require use of the Kahoolawe minefield and shallow water in this area.
- Unit level anti-submarine warfare training during the basic phase is conducted within this area.
- Insertion and extraction utilizing small submersible vessels and small boats (rigid-hulled inflatable boats and zodiacs) is conducted around the waters off Maui. This area provides a unique and highly important shallow water training environment in which units can practice operations in littoral areas that are both shallow and navigationally constrained. This network of shallow water inter-island channels is unique within the Eastern and Mid Pacific training range complexes. The area provides an unmatched opportunity for submarines to train in shallow water without the need to use active sonar during their searches. Training in these littoral areas will allow fleet units to continue to deploy improved sensors and tactics in littoral waters into the future. In general for the Hawaii Range Complex, pushing anti-submarine warfare training

further from land and out of the littorals would add transit time (increased fuel and loss of training time) in addition to providing an environment less likely to be expected in operating areas during deployment.

Loss of the shallow to deep transition would eliminate up/downslope exploitation and bottom bounce investigations, for example. Water space outside of Hawaii OPAREA can be subject to seasonal extremes making large sea states, decreasing training value. Lastly, pushing training and testing further from land increases the difficulty in air control reporting and coordination required to conduct integrated readiness activities. While Kaiwi Channel between Molokai and Oahu is not routinely used for training that involves strait transiting while protecting high-value units, this channel provides for opportunistic training within a channel environment for Navy ships homeported in Pearl Harbor. The Kaiwi Channel also overlaps partially with the Aloha submarine transit lane where some opportunistic mid-frequency active sonar and anti-submarine warfare training occurs when ships and submarines are present in this area. Training and testing activities using in-water explosives are not conducted in Kaiwi Channel, as this area is not within Special Use Airspace. Overall, this area is characterized as an area of "low use" for mid-frequency active sonar.

K.3.3.1.8 4-Islands Region False Killer Whale Small and Resident Population Area, Mitigation Considerations

The training value within the 4-Islands Region is much higher compared to other near shore environments within the Hawaii Range Complex, including the ranges at the Pacific Missile Range Facility, due to the challenging bathymetry. Shifting the location for Submarine Command Course would result in a loss of shallow water operating experience for prospective submarine Commanding Officers, which is an absolutely vital skill for these commanders to master. Such a shift in location would result in a loss of shallow water operating experience and would compromise a submarine crew's ability to retain and improve their capabilities and to train with new emerging technologies.

Training and testing using in-water explosives are not typically conducted within the 4-Islands Region as these areas are not a designated underwater training range or within Special Use Airspace. All training and testing in the 4-Islands Region is conducted using non-explosive munitions.

While the Navy has been training and testing in the area with the same basic systems for over 40 years, there is no evidence of any adverse impacts having occurred, and there are multiple lines of evidence demonstrating the population's high site fidelity to the area. Animals within the False Killer Whale Small and Resident Population Area could be exposed to sound from sonar or other transducers and some behavioral or temporary impacts could occur from the occasional use of mid-frequency active sonar during the Submarine Command Course and unit-level training and testing. However, given the critically endangered status of the main Hawaiian Islands insular false killer whale, the Navy has considered the biological effectiveness and operational assessment of implementing additional mitigation area measures that would be expected to further reduce the number and level of potential impacts on false killer whales and their habitat in the small and resident area in the 4-Islands Region.

Expanding the 4-Islands Region Mitigation Area (previously known as the Humpback Whale Cautionary Area) (Figure K.3-9) north of Molokai and Maui to overlap partially with that portion of the 4-Islands Region False Killer Whale Small and Resident Population Area would provide some additional protection to main Hawaiian Islands insular false killer whales and their habitat during that time of year. The Navy would restrict the use of all surface ship hull-mounted mid-frequency active sonar during testing, unit-level training and major training exercises in the Cautionary Area from November 15 through April 15.

K.3.3.2 North and East of Oahu False Killer Whale Small and Resident Population Areas

In the waters off Oahu, there are two separate small False Killer Whale Small and Resident Population Areas with one located offshore of Kaena Point and the other located north and east of Kahuku. These two designated areas are square in shape and situated between the 200 m and the 1,000 m isobaths. These areas do not overlap any of the settlement areas described in Section K.1.1.2 (Provisional 2015 Prohibited or Restricted Areas within HSTT Study Area).

K.3.3.2.1 Navy Requirements for Area Specific Training and Testing

The False Killer Whale Small and Resident Population Area north of Oahu (Kaena Point) partially overlaps with Warning Area 189 (W-189) which is routinely used by Navy MH-60 helicopters and Marine Corps rotary wing aircraft based out of Marine Corps Base Hawaii. The limited distance from land that rotary wing can travel because of fuel limitations and safety factors dictate the use of this area versus other areas. However, non-explosive gunnery and rockets and dipping sonar used during anti-submarine warfare training would likely occur further offshore in W-189 outside 12 NM, and not within these biologically important areas north and east of Oahu. The False Killer Whale Small and Resident Population Area offshore of Kahuku does not overlap any designated training and testing areas or airspace. However, the area is en route to Warning Areas (W-189 and W-190) where the Navy does conduct air warfare activities. The North and East of Oahu False Killer Whale Small and Resident Population Areas are considered areas of "low use" of active sonar.

K.3.3.2.2 North and East of Oahu False Killer Whale Small and Resident Population Areas Mitigation Considerations

The identified small and resident population areas only overlap with a very small portion of the Hawaii Range Complex and are located within nearshore waters where the Navy does not typically conduct activities that involve sonar or other transducers, especially more intense activities like major training events. However, animals within the False Killer Whale Small and Resident Population Area could be exposed to sound from sonar or other transducers and some behavioral or temporary impacts could occur from the occasional use of mid-frequency active sonar during aircraft and surface ship unit-level training and testing. Training and testing using in-water explosives are not typically conducted within the False Killer Whale Small and Resident Population Areas north and east of Oahu as these areas are not a designated underwater training range nor within Special Use Airspace.

K.3.3.3 False Killer Whale Small and Resident Population Area Mitigation Assessment

Consistent with the literature and results from Navy-funded false killer whale tagging studies between 2010 and 2016, analysis indicates false killer whale reactions to sonar are expected to be short-term and mild to moderate, especially when sound sources are located more than a few kilometers away or when the animals are engaged in important biological behaviors, such as feeding and reproduction. Any disruptions to behavior would not rise to the level of significant under NEPA nor would they be sustained for a duration long enough that it caused an animal to be outside of normal daily variations in feeding, reproduction, resting, migration/movement, or social cohesion disruptions. The current HSTT settlement agreement prohibits the use of in-water explosives, within Areas 1-A through 1-E, 2-E, and 2-A through 2-D which overlap with the False Killer Whale Small and Resident Population Area. However, these areas are not historically used for explosives training and testing, therefore, false killer whales in the small and resident population areas would not be exposed directly to sound or energy from explosives and impacts would not be anticipated.

However, given that this stock is critically endangered with a potential biological removal (PBR) of less than one individual [0.18], the Navy considered methods of meaningfully reducing any potential adverse impacts to the main Hawaiian Islands insular false killer whales from acoustic stressors. The Navy balanced the need for the use of the small and resident population areas to meet training and testing requirements with the biological importance of the area to false killer whales. The Navy determined that establishing mitigation areas would likely reduce the number and level of impacts to this species and other species or stocks, including humpback whales, Cuvier and Blainville's beaked whales, pygmy killer whales, dwarf sperm whales, melon-headed whales, short-finned pilot whales and dolphin species occurring within the area without compromising military readiness. Two of these mitigation areas (Hawaii Island Mitigation Area and the 4-Islands Region Mitigation Area) overlap areas of high use by main Hawaiian Islands insular false killer whales. Although false killer whales have not been observed responding to mid-frequency active sonar, the following mitigation areas were largely chosen to provide a reduction of exposure to mid-frequency active sonar on this rare stock:

1. Hawaii Island Mitigation Area – limits the amount of surface ship hull-mounted mid-frequency active sonar (MF1) and dipping sonar (MF4) and restricts the use of explosives during testing, unit-level training, and major training exercises year-round (Figure K.2-2).
2. 4-Islands Region Mitigation Area – restricts surface ship hull-mounted mid-frequency active sonar (MF1) during training and testing in the mitigation area from November 15 through April 15. In addition, the Navy will restrict the use of explosives during training and testing in the 4-Island Regions Mitigation Area, year-round (Figure K.2-3).

See Section K.2.2 (Mitigation Areas to be Implemented) for more details on the above mitigation areas.

Given the extremely limited overlap of Navy training and testing activities within the Oahu Main Hawaiian Insular False Killer Whale Biologically Important Area, implementing geographic mitigation requiring the Navy to avoid this biologically important area would not be effective at further reducing adverse impacts on the resident population in the area since are none are anticipated.

As discussed in Section K.3.3.3.5 (Navy Requirements for Area-Specific Training and Testing), due to the strategic importance of the Alenuihaha Channel, the Navy cannot completely prohibit the use of surface ship hull-mounted mid-frequency active sonar or dipping sonar during training and testing. However, the Navy proposes to limit the amount of surface ship hull-mounted mid-frequency active sonar and dipping sonar used in the channel. The limited use of these sonar systems still allows naval forces to train in an environment that replicates the actual areas where they will be called to serve while likely reducing the number and level of impacts to critically endangered false killer whales as well as for other species or stocks, including humpback whales, Cuvier and Blainville's beaked whales, pygmy killer whales, dwarf sperm whales, melon-headed whales, short-finned pilot whales and dolphin species occurring within the area without compromising military readiness.

Navy vessels operate differently from commercial vessels in ways that are important to prevent whale collisions. As described in Section 2.3.3 (Standard Operating Procedures), surface ships operated by or for the Navy, have personnel assigned to stand watch at all times, day and night, when a ship or surfaced submarine is moving through the water (underway). Available literature suggests that based on their smaller body size, maneuverability, larger group sizes, and hearing capabilities, most odontocetes would be less likely to be struck by a Navy vessel than mysticetes. Generally, odontocetes are more capable of physically avoiding a vessel strike and since some species occur in large groups, they are more easily seen when they are closer to the water surface.

Mitigation measures described in Chapter 5 (Mitigation) are designed to avoid or reduce impacts to marine species and stocks throughout the Study Area. These measures would also limit the interaction between Navy vessels and odontocetes, further reducing the potential for vessel strikes in and outside of identified biologically important areas.

K.3.4 Hawaii Island Pygmy Killer Whale Small and Resident Population Area

The Pygmy Killer Whale Small and Resident Population Area is shown on Figure K.3-7 and covers approximately 2,270 km^2 of water space off Hawaii Island. This area extends from the Kona Coast and around the south point of the island of Hawaii (Baird et al., 2015a). The water depth of the area includes shallow water at the coast but extends to where the depth is over 3,200 m. As shown in Table K.1-1, and described in Section K.1.1.2 (Provisional 2015 Prohibited or Restricted Areas within HSTT Study Area), the Pygmy Killer Whale Small and Resident Population Area overlaps with HSTT Settlement Areas 1-A, 1-C, 1-D, 1-E, and 2-E.

K.3.4.1 General Biological Assessment

For a thorough description of the pygmy killer whale species, see Section 3.7.2.3.9 (Pygmy Killer Whale [*Feresa attenuata*]).

The pygmy killer whale is protected under the MMPA and is not listed under the ESA. At present, all pygmy killer whales in Hawaiian waters are part of a single population managed as the Hawaiian stock.

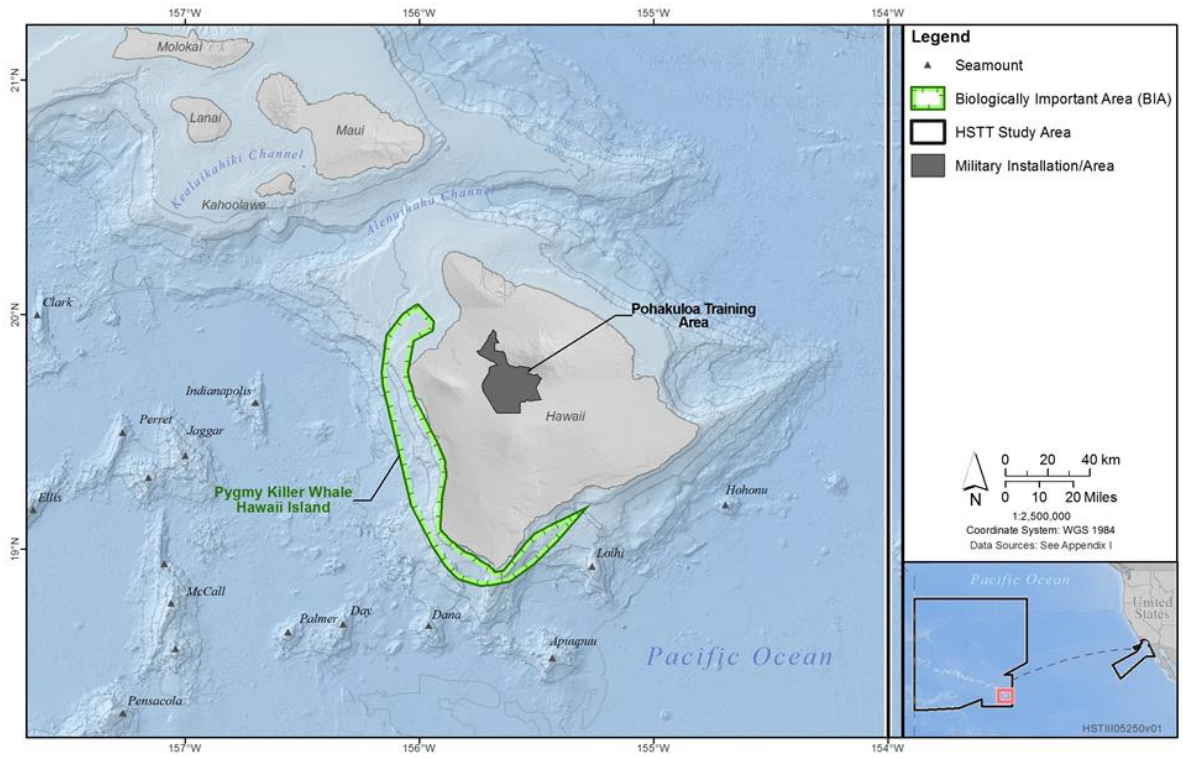


Figure K.3-7: Pygmy Killer Whale Small and Resident Population Area off Hawaii Island

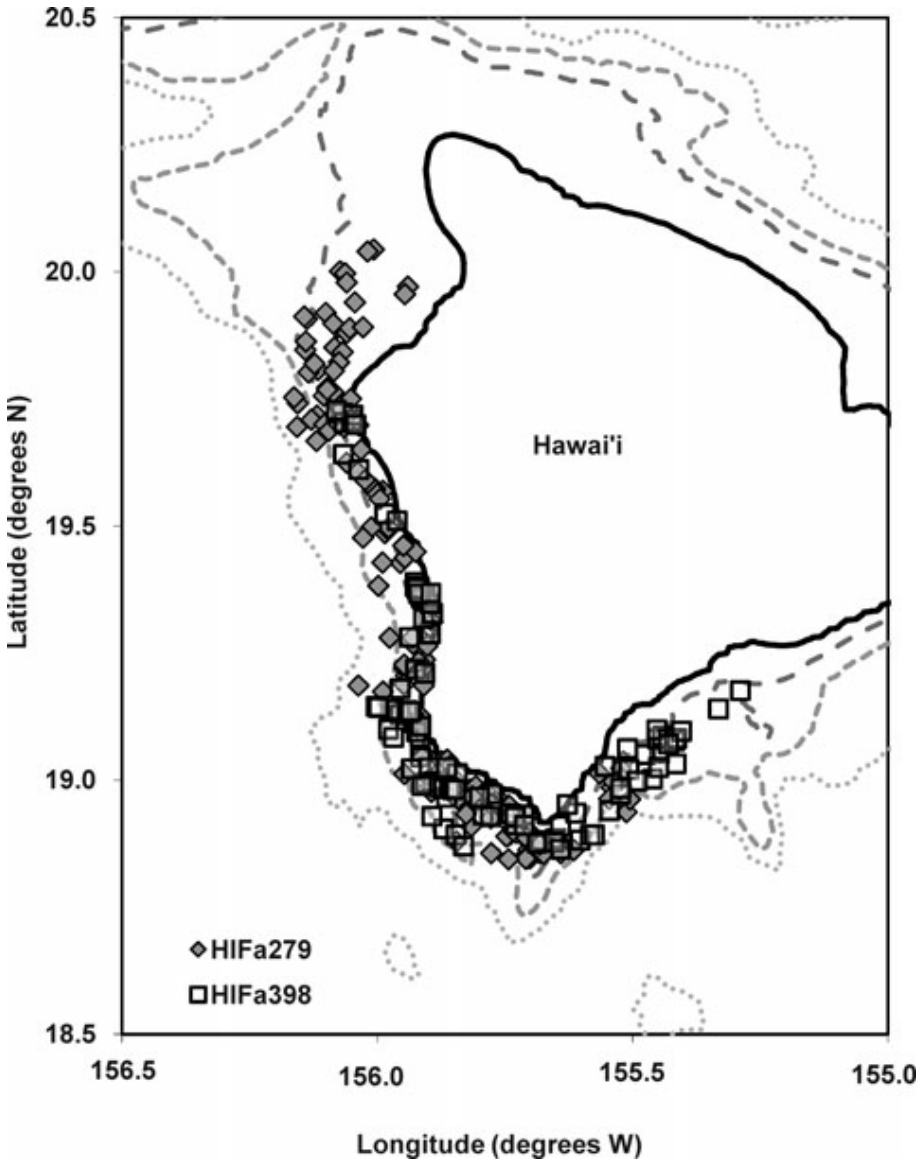
K.3.4.1.1 Biological Considerations Applicable to the Pygmy Killer Whales Small and Resident Population Area

In the Hawaiian Islands, pygmy killer whales have been sighted during small boat surveys close to shore off Kauai, Niihau, Oahu, Lanai, and Hawaii Island (Baird et al., 2011a; Baird et al., 2011c; Baird et al.,

2013c; McSweeney et al., 2009; Oleson et al., 2013) as well as sighted far offshore during NMFS line transect surveys for the Hawaiian Islands (Barlow, 2006; Bradford et al., 2017); (Carretta et al., 2017).

Adjacent to Hawaii Island where research has been focused and ongoing for almost three decades, pygmy killer whales were opportunistically photo-identified whenever encountered, which led to the identification of individuals being present in those waters off the island of Hawaii over spans of up to 27 years (Baird et al., 2015a; McSweeney et al., 2009). It is due to the identification and long-term residency of those individual pygmy killer whales that an area has been designated for the small and resident population present off the west and southeast shores of Hawaii Island (Baird et al., 2015a). Assessment of potential genetic differentiation of these resident pygmy killer whales off the island of Hawaii from other areas has not been undertaken due to insufficient genetic sample sizes (Oleson et al., 2013). As a result, there is no information available to determine the degree of interchange or the degree of isolation for the pygmy killer whales off Hawaii Island as a small and resident population.

The area identified for the resident population is in waters along the west side of the island of Hawaii, from area offshore of Kawaihae stretching south around South Point to a point midway along the southeast coast of the island (Baird et al., 2015a). The boundaries for the area were delimited by encompassing locations from two tracked pygmy killer whales; a satellite-tagged individual over 11 days in 2008 and locations from another individual tagged in 2009 and tracked over 15 days (Baird et al., 2011a; Baird et al., 2011c; Baird et al., 2015a). Both individuals had been identified in the general area in prior years and both were tagged when they were part of a group of pygmy killer whales.



Source: Baird et al., 2011b

Figure K.3-8: Tracked Locations of Pygmy Killer Whales

Note: Offshore Hawaii Island in December 2008 (HIFa398) and April 2009 (HIFa279).

As shown in Figure K.3-8, both tagged individuals remained strongly associated with the island slope during the periods of tag signal contact (Baird et al., 2011a; Baird et al., 2011c). Given the area was delimited using a small sample size based on only two individuals and over two short time periods, the known range for the population is likely to increase if additional satellite-tag data become available (Baird et al., 2015b).

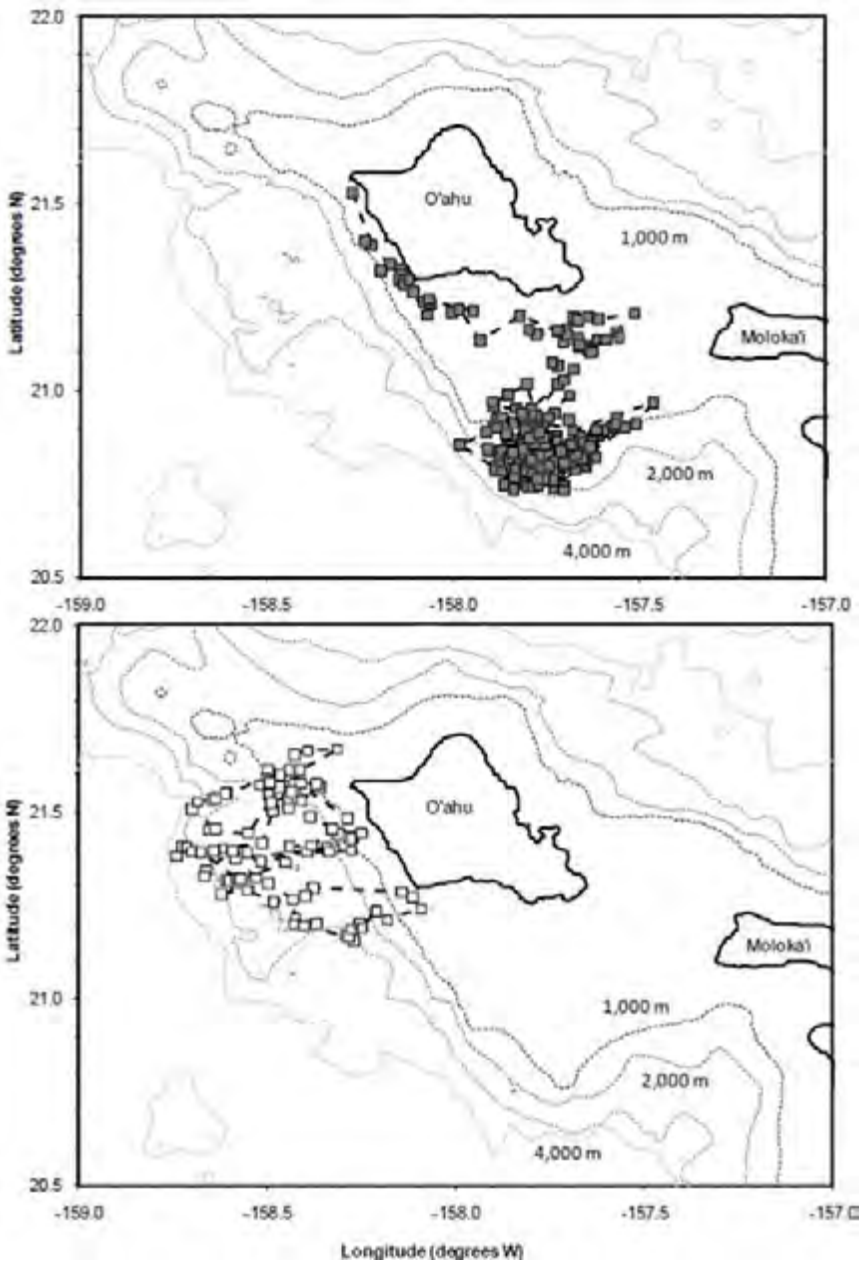
In 2010, two individuals in two groups of pygmy killer whales were satellite tagged off Oahu (Baird et al., 2011a; Baird et al., 2015a). Both tagged whales had been photographed together twice off Oahu in two prior years and both were observed together again at the end of 2010 after the tags had come off (Baird et al., 2011a). The group tracked for 30 days was mainly composed of animals (12 of 15) that had been previously identified off Oahu in prior years. As shown in Figure K.3-9 (from Baird et al. (2011a); Figure

2), this group moved through waters along the south and west shores of Oahu and across the Kaiwi Channel to the far end of Penguin Bank, an area roughly centered approximately 30 NM south of Oahu (Baird et al., 2011a). In the other group, although 17 individuals were photographed, none had been previously identified off Oahu, although one individual had been previously documented off the island of Lanai and another previously off the island of Hawaii (Baird et al., 2011a). The distances to these islands from Oahu indicate approximate movements within a range of at least 40 NM and 120 NM.

This second group was only tracked for seven days, but the entire time remained off the west coast of Oahu. Baird et al. (2011a) suggested that the low re-sighting rate based on photo identification and movement pattern over the seven-day tracking period indicated this second group was not resident to the island of Oahu.

Based on all the photo identification and tracking of pygmy killer whales to date, Oleson et al. (2013) proposed recognition of an island-associated stock of pygmy killer whales with a range of up to 20 km from shore for the main Hawaiian Islands, but this proposal was not incorporated into subsequent management of stocks in the Hawaiian Islands (Carretta et al., 2014; Carretta et al., 2017). During the effort to identify biologically important areas in the Hawaiian Islands, there was recognition that, as additional future information is obtained on core area use and range for individuals considered part of the "Oahu resident population," an additional biologically important area would likely be warranted for that population (Baird et al., 2015a). In summary, pygmy killer whales have been encountered during small boat surveys close to shore off most of the main Hawaiian Islands as well as the open ocean far offshore. At present, all pygmy killer whales in Hawaiian waters are part of a single population managed as the Hawaiian stock (Carretta et al., 2016b).

Even without a comprehensive or representative survey sampling of the nearshore areas in the Hawaiian Islands, photo identification has documented individuals moving between islands and groups of "resident" and suggested non-resident animals using the same habitat off Oahu. Long-term residency by individuals documented over decades in areas like the waters off Oahu and Hawaii Island suggest a general lack of threats to those individuals in the open ocean offshore areas. At present, all pygmy killer whales in Hawaiian waters are part of a single population managed as the Hawaiian stock (Carretta et al., 2017). Even without a comprehensive or representative survey sampling of the nearshore areas in the Hawaiian Islands, photo identification has documented individuals moving between islands and groups of "resident" and suggested non-resident animals using the same habitat off Oahu. Long-term residency by individuals documented over decades in areas like the waters off Oahu and Hawaii Island suggest a general lack of threats to those individuals in the small and resident population.



Source: Baird et al., 2011a

Figure K.3-9: Tracked Locations of Pygmy Killer Whales off Oahu in 2010.

Note: The upper box depicts the locations over 30 days of the group containing individuals identified off Oahu in previous years. The lower box depicts the locations of the group tracked over seven days and having no individuals previously documented off Oahu, but two individuals previously documented with one off Lanai and one off Hawaii islands; well to the southeast of the area shown in the figure.

K.3.4.1.2 Stressor Analysis

K.3.4.1.2.1 Sonar and Other Transducers

As detailed in Section 3.7.3.1.2 (Impacts from Sonar and Other Transducers), pygmy killer whales in Hawaii may be exposed to sound from sonar and other transducers used during training and testing activities throughout the year. Quantitative acoustic analysis for the entire Hawaii population estimates that all exposures result in behavioral reactions or TTS, and zero exposures resulting in PTS are anticipated.

The identified small and resident population area off Hawaii Island is mostly located within nearshore waters where the Navy does not typically conduct activities that involve sonar or other transducers, especially more intense activities such as anti-submarine warfare training or major training events. While impacts on pygmy killer whale natural behaviors due to training and testing with sonar and other transducers may occur within the small and resident population area, they are unlikely to rise to the level of significant under NEPA nor would they be sustained for a duration long enough to cause an animal to be outside of normal daily variations in feeding, reproduction, resting, migration/movement, or social cohesion. Any TTS in the biologically important areas would be minor to moderate, from which the individual would fully recover quickly.

K.3.4.1.2.2 Explosives

As detailed in Section 3.7.3.2.2 (Impacts from Explosives), pygmy killer whales may be exposed to explosives which may result in behavioral reactions or TTS, however, most activities that involve underwater detonations and explosive munitions typically occur more than 3 NM from shore in areas that are designated for explosive use. Historical data suggests that explosive events are most likely to be scheduled at Puuloa Underwater Training Range, W-188, or KAPU HOT in W-192 south of Oahu (Figure K.3-3) for ease of scheduling, safety, instrumentation, and airspace concerns. These areas are outside of the pygmy killer whale small and resident population area. Sound from explosives could still expose animals within the pygmy killer whale small and resident population area to acoustic stressors, and some impacts on behavior could occur.

Although Navy monitoring data has added to the scientific base of knowledge on species/stock occurrence, habitat use, and genetics, the Navy is not aware of any research or monitoring data that specifically evaluates pygmy killer whale responses to explosives. A general discussion of the effects of explosives and blast trauma to marine mammals is discussed in Section 3.7.3.2 (Explosive Stressors).

K.3.4.1.2.3 Vessel Strike

As discussed in Section 3.7.3.4.1 (Impacts from Vessels and In-Water Devices), in general, odontocetes, including pygmy killer whales, move quickly and seem to be less vulnerable to vessel strikes than other cetaceans; however, most small whale and dolphin species have at least occasionally suffered from strikes attributed to small boats and craft such as jet skis.

Odontocetes that occur within the Study Area have varying patterns of occurrence and distribution which overlap with areas where vessel use associated with Navy training and testing activities would occur. Available literature suggests that due to their smaller body size, maneuverability, larger group sizes, and hearing capabilities, most small odontocetes are not likely to be struck by a Navy vessel. Generally, odontocetes are more capable of physically avoiding a vessel strike and since some species occur in large groups, they are more easily seen when they are closer to the water surface.

Some studies established that marine mammals engage in avoidance behavior when surface vessels move toward them. It is not clear whether these responses are caused by the physical presence of a surface vessel, the underwater noise generated by the vessel, or an interaction between the two.

K.3.4.2 Hawaii Island Pygmy Killer Whales Small and Resident Population Area, Settlement Areas 1-A, 1-C, 1-D, 1-E, and 2-E

K.3.4.2.1 Navy Requirements for Area-Specific Training and Testing

The Hawaii Island Pygmy Killer Whale Small and Resident Population Area is just south and west of Kawaihae Harbor. These waters west of Hawaii and Kawaihae Harbor provide access for a broad spectrum of naval and amphibious training. Kawaihae Harbor is the point of amphibious insertion for forces proceeding to the live-fire range at Pohakuloa Training Area, and this training area is the only live-fire range in the Hawaii Range Complex that supports ground force and aviation live-fire training. Training in this area allows for the integration of carrier strike group operations and amphibious landings. Sea, air, and land-based units work in conjunction with one another in controlled airspace in close proximity to the Pohakuloa Training Area range, the only range of its kind in Hawaii. This is also an area outside of civilian air traffic corridors approaching the Honolulu International Airport which is necessary to safely de-conflict with civilian air traffic.

Carrier strike group training can include a full spectrum of the force – various ships, submarines, aircraft, and Marine Corps forces – –to ensure such forces obtain the required proficiency to conduct anti-submarine warfare in a controlled and observed environment prior to deployment to international straits across the globe, where operational Commanders require Naval forces to be able to conduct a range of military operations, including anti-submarine warfare. This required proficiency cannot be replicated by simulation and is most effectively obtained when conducted in a strait. Commanding Officers cannot be expected to effectively conduct such operations in a deployed environment if the first time they encounter a submarine in a strait is in a deployed setting. Access to the waters west of Kawaihae Harbor is vital for amphibious training. The west coast of Hawaii is one of the best locations for integrated joint marine amphibious operations because of its close proximity to the Pohakuloa Training Area. Also, due to its proximity to the Alenuihaha Channel, waters west of Hawaii and Kawaihae Harbor have strategic importance during portions of Undersea Warfare training, Independent Deployer Certification training, Rim of the Pacific, and unit level training and other exercises The area provides a unique and irreplaceable capability within the Hawaii Range Complex that allows naval forces to conduct realistic, integrated training in an environment that replicates the actual areas where they will be called to serve.

Activities utilizing in-water explosives, such as underwater detonations, bombing or torpedo exercises, are not conducted in the waters within the Pygmy Killer Whale Small and Resident Population Area since it is not within a designated underwater training range or within Special Use Airspace, typically necessary for in-water explosive usage.

K.3.4.3 Pygmy Killer Whales Small and Resident Population Area Mitigation Assessment

The identified small and resident population area only takes up a very small portion of the Hawaii Range Complex and is located within nearshore waters where the Navy does not typically conduct activities that involve sonar or other transducers, especially more intense activities such as anti-submarine warfare training or major training events. However, animals within the Pygmy Killer Whale Small and Resident Population Area could be exposed to sound from sonar or other transducers and some behavioral or temporary impacts could occur from the occasional use of mid-frequency active sonar

during Undersea Warfare training, Independent Deployer Certification training, and Rim of the Pacific training.

The current HSTT settlement agreement prohibits the use of in-water explosives within Areas 1-A, 1-C, 1-D, 1-E, and 2-E. However, these areas are not historically used for explosives training and testing. Therefore, pygmy killer whales in the small and resident population areas would not be exposed directly to sound or energy from explosives and impacts are not anticipated.

The Navy balanced the need for the use of the area to meet training and testing requirements with the biological importance of the area to pygmy killer whales and proposes to an implement mitigation area that overlaps some portions of the Small and Resident Population Area. While this mitigation area is designed to provide additional protection for humpback whales, false killer whales and beaked whale species, these measures would also reduce the number and level of impacts to these and other species or stocks occurring within the area, including pygmy killer whales, dwarf sperm whales, melon-headed whales, short-finned pilot whales and dolphin species. The Navy determined that establishing this mitigation area would not compromise military readiness:

Hawaii Island Mitigation Area – limits the amount of surface ship hull-mounted mid-frequency active sonar (MF1) and dipping sonar (MF4), and restricts the use of explosives during testing, unit level training and major training exercises year-round (Figure K.2-2).

See Section K.2.2 (Mitigation Areas to be Implemented) for more details on the above mitigation areas.

Navy vessels operate differently from commercial vessels in ways that are important to prevent whale collisions. As described in Section 2.3.3 (Standard Operating Procedures), surface ships operated by or for the Navy, have personnel assigned to stand watch at all times, day and night, when a ship or surfaced submarine is moving through the water (underway).

Available literature suggests that based on their smaller body size, maneuverability, larger group sizes, and hearing capabilities, most odontocetes would be less likely to be struck by a Navy vessel than mysticetes. Generally, odontocetes are more capable of physically avoiding a vessel strike and since some species occur in large groups, they are more easily seen when they are closer to the water surface.

As discussed in Section 3.0.3.3.4.1 (Vessels and In-Water Devices), large Navy ships typically operate at average speeds of between 10 and 15 knots, which for reference is slower than large commercial vessels, such as container ships that steam at approximately 24 knots during normal operations (Maloni et al., 2013). Operating vessels at speeds that are not optimal for fuel conservation or mission requirements would be unsustainable due to increased time on station and increased fuel consumption. Each ship has a limited amount of time that it can be underway based on target service requirements and ship schedules. Ship schedules are driven largely by training cycles, scheduled maintenance periods, certification schedules, and deployment requirements. Because of the complex logistical considerations involved with maintaining ship schedules, the Navy does not have the flexibility to extend the amount of time that ships are underway during training and testing, which would result from vessel speed restriction mitigation. If the Navy were to incorporate vessel speed restrictions into event planning for approximately 3–6 months out of the year, ships would be unable to meet all of their requirements during their limited time available to be underway. This would hold true even if the restrictions only applied to transits to and from training or testing event locations and not during the events themselves. Therefore, it would not be practicable for the Navy to implement speed restrictions within the biologically important areas.

As described in Section 5.3.4.1 (Vessel Movement), additional vessel speed restrictions would prevent vessel operators from gaining handling proficiency, would prevent the Navy from properly testing vessel capabilities, and would increase required the time on station during training or testing events to build skill proficiency or properly test vessel capabilities (which would significantly increase fuel consumption); therefore, the proposed mitigation would have significant impacts on the Navy's ability to train and test, and would prevent the Navy from meeting its mission requirements.

The Navy's standard operating procedures discussed in Chapter 5 (Mitigation), mitigation measures are designed to avoid or reduce impacts to marine species and stocks throughout the Study Area. These measures would also limit the interaction between Navy vessels and odontocetes, further reducing the potential for vessel strikes in and outside of identified biologically important areas.

K.3.5 Hawaii Island Short-Finned Pilot Whale Small and Resident Population Area

An area with a small and resident population of short-finned pilot whales (*Globicephala macrorhynchus*) in waters along the Kona coast and channel of Hawaii Island (Figure K.3-10) has been identified as a year-round biologically important area (Baird et al., 2015a). The Short-finned Pilot Whale Small and Resident Population Area covers approximately 2,970 km^2 of water space off Hawaii Island. The biologically important area was designated as a "contiguous high-use area" derived from satellite tag data from 35 tag deployments off the west side of Hawaii Island. As shown in Table K.1-1, and described in Section K.1.1.2, (Provisional 2015 Prohibited or Restricted Areas within HSTT Study Area), the Short-finned Pilot Whale Small and Resident Population Area overlaps with HSTT Settlement Areas 1-A through 1-D.

K.3.5.1 General Biological Assessment

For a thorough description of the common short-finned pilot whale species, see Section 3.7.2.3.10 (Short-finned Pilot Whale [*Globicephala macrorhynchus*]).

Short-finned pilot whales are found worldwide within tropical, subtropical, and warm-temperate waters (Baumann-Pickering et al., 2016b; Van Cise et al., 2016). In the Hawaiian Islands, short-finned pilot whales have been the most commonly encountered species of odontocete during near-shore surveys and the second most common odontocete encountered in deep offshore waters during the two NMFS systematic ship surveys of the Hawaiian Exclusive Economic Zone (25 sightings in 2002, and 36 sightings in 2010) (Baird, 2013; Barlow, 2006; Bradford et al., 2013; Bradford et al., 2017; Oleson et al., 2013). Acoustic data also indicates a widespread use of the HSTT Study Area by pilot whales (Baumann-Pickering et al., 2010; Klinck et al., 2015; Lammers et al., 2015b). Small boat surveys from 2003 through 2015 have photo-identified hundreds of individuals and in conjunction with satellite tag tracking data have provided evidence suggesting the presence of both island area associated groups of pilot whales and groups that are part of a widely-ranging open-ocean population (Baird et al., 2003; Baird et al., 2011a; Baird et al., 2013c; Baird et al., 2014a; Baird et al., 2015a; Baird et al., 2015b; Baird et al., 2016b; Mahaffy et al., 2015a; Oleson et al., 2013). At present, all short-finned pilot whales in Hawaiian waters are part of a single population managed as the Hawaiian stock (Carretta et al., 2017).

K.3.5.1.1 Biological Considerations Applicable to the Short-finned Pilot Whales Small and Resident Population Area

Years of small boat sighting data, photo-identification data demonstrating long-term re-sightings of individuals, and satellite-tag deployments indicating high site fidelity suggest that at least some portion

of the pilot whales documented off Hawaii Island are resident to the island (Baird et al., 2013c; Baird et al., 2015a; Mahaffy et al., 2015a; Oleson et al., 2013). As a result, a year-round small and resident population area has been identified for short-finned pilot whales extending approximately 85 NM north to south off the west coast of the Island of Hawaii (Baird et al., 2015a). This small and resident area for short-finned pilot whales is different than some of the other biologically important areas in the Hawaiian Islands (such as the small and resident area for pygmy killer whales), because it does not enclose the entirety of the locations where the animals have been observed. The pilot whale area is instead a "contiguous high-use area" derived from satellite tag data locations from 35 tag deployments off the west side of Hawaii Island between 2006 through 2010 (Baird et al., 2015a).

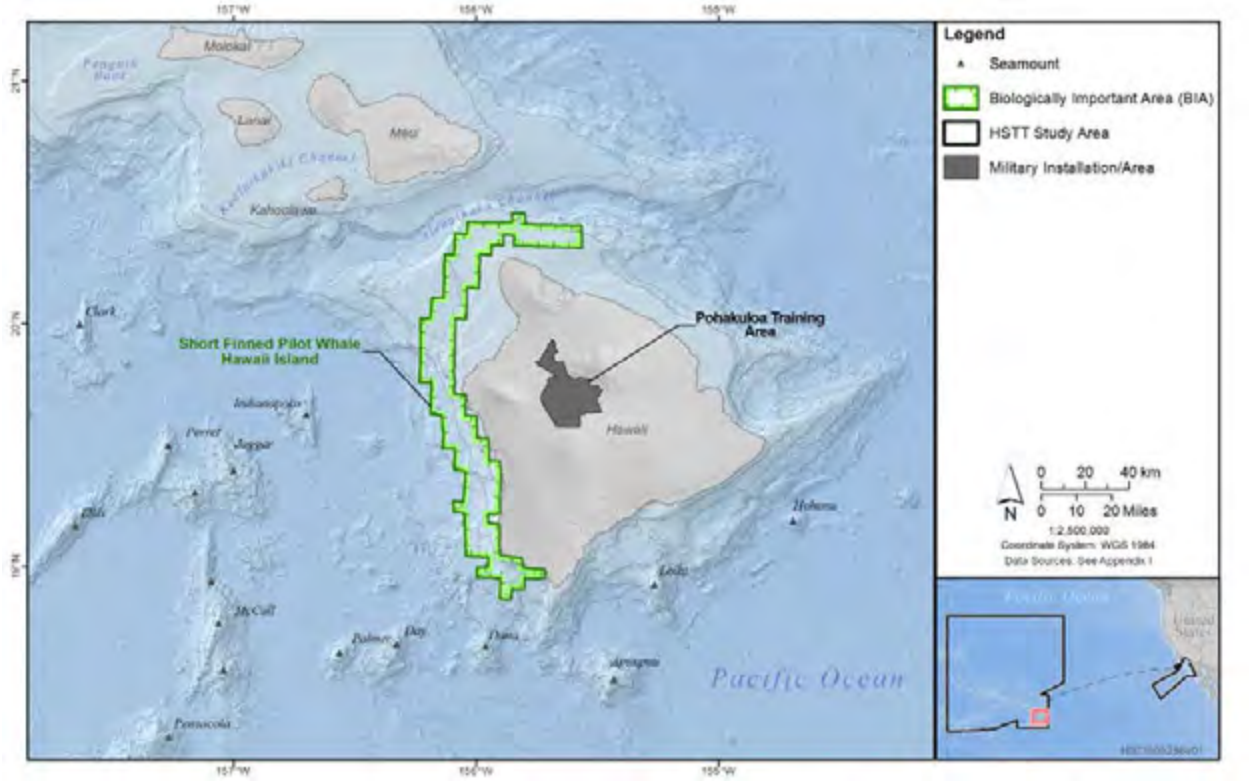


Figure K.3-10: Short-Finned Pilot Whale Small and Resident Population Area

The high-use locations were identified by taking the total time of all satellite tracks within 5 km × 5 km grid cells and those cells with total time greater than one standard deviation above the mean were classified as part of the high-use area. The resulting boundary identified for the short-finned pilot whale small and resident population area was formed by the largest contiguous block of these derived high-use grid cell locations (Baird et al., 2015a; Mahaffy et al., 2015a).

The presence of short-finned pilot whales has also been surmised south of Oahu and outside of the identified biologically important area based on passive acoustic detections of low-frequency whistles (Klinck et al., 2015). Between December 11, 2014 and January 26, 2015, a passive acoustic survey was conducted in the Hawaii Range Complex using an autonomous glider fitted with an acoustic receiver. The survey began and ended approximately 120 km south of Honolulu, Oahu, navigating a circular track through deep ocean waters that intermittently crossed over or near multiple seamounts. Low-frequency whistles and clicks were detected and likely associated with four species based on the frequency characteristics of the whistles: false killer whale, short-finned pilot whale, melon-headed whale, and

rough-toothed dolphin. The whistles were most often detected near bathymetric features (e.g., seamounts) (Figure K.3-11).

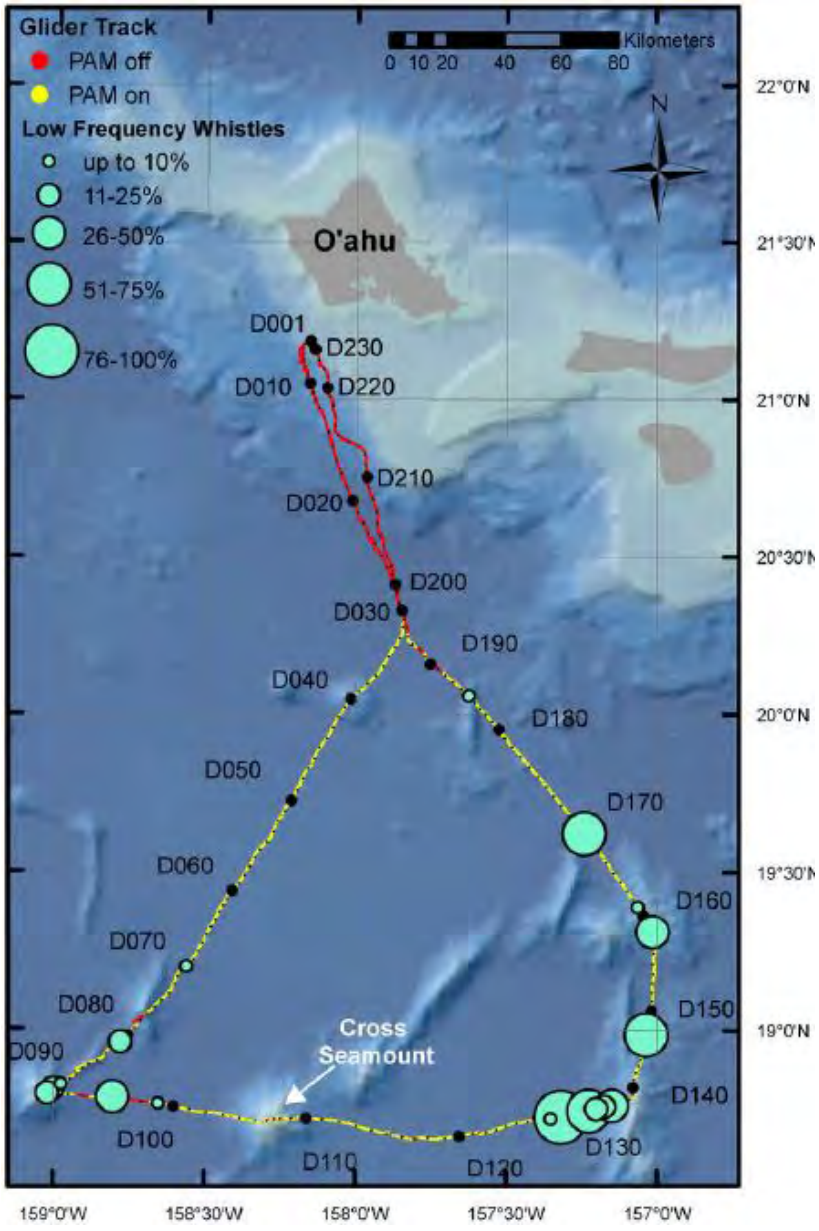


Figure K.3-11: Low-Frequency Detections During a Passive Acoustic Survey South of Oahu

Notes: Circle size indicates percentage of recording time per dive with target signals. PAM = Passive Acoustic Monitoring. Source: Adapted from Klinck et al. (2015)

K.3.5.1.2 Stressor Analysis

K.3.5.1.2.1 Sonar and Other Transducers

As detailed in Section 3.7.3.1.2 (Impacts from Sonar and Other Transducers), short-finned pilot whales in Hawaii may be exposed to sound from sonar and other transducers used during training and testing activities throughout the year. Analysis for the entire Hawaii population estimates that all exposures result in behavioral reactions or TTS, and zero exposures resulting in PTS are anticipated. Navy training

activities that use sonar and other transducers could occur year-round within the Hawaii Range Complex. There have been two occasions where research has documented the exposure of short-finned pilot whales to Navy hull-mounted mid-frequency sonar in Hawaii (Baird et al., 2014b; Mobley & Deakos, 2015), though they did not occur in the designated small and resident population area. On both those occasions the received levels were relatively high (154 & 157 dB re 1 µPa) and yet no overt avoidance or other discernable change in behavior was observed in the whales. The acoustic criteria used by the Navy and NMFS to predict exposures indicate that there was a relatively high probability of a significant behavioral reaction at those received levels over long exposure periods (up to 3 days). The tagged individual was photo-identified as being from the resident population to the Kauai and Niihau area, and on the third day of sonar use on the range off Kauai, "moved in a fairly directional manner" towards the sonar activity and areas of higher sound level (Baird et al., 2014b).

This identified small and resident population area is mostly located within nearshore waters where the Navy does not typically conduct activities that involve sonar or other transducers, especially more intense activities such as anti-submarine warfare training or major training events. While impacts on short-finned pilot whale natural behaviors due to training and testing with sonar and other transducers may occur within the small and resident population area, they are unlikely to rise to the level of significant under NEPA nor would they be sustained for a duration long enough to cause an animal to be outside of normal daily variations in feeding, reproduction, resting, migration/movement, or social cohesion. Any TTS in the biologically important areas would be minor to moderate, from which the individual would fully recover quickly.

K.3.5.1.2.2 Explosives

As detailed in Section 3.7.3.2.2 (Impacts from Explosives), short-finned pilot whales may be exposed to explosives which may result in behavioral reactions or TTS. Most activities that involve underwater detonations and explosive munitions typically occur more than 3 NM from shore in areas that are designated for explosive use. Historical data suggests that explosive events are most likely to be scheduled at Puuloa Underwater Training Range, W-188, or KAPU HOT (Figure K.3-3) for ease of scheduling, safety, instrumentation, and airspace concerns. These areas are outside of the short-finned pilot whale small and resident population area. Sound from explosives could still expose animals within the short-finned pilot whale small and resident population area to acoustic stressors, and some impacts on behavior could occur. However, significant impacts to short-finned pilot whale natural behaviors or abandonment due to training with explosives are unlikely to occur within the small and resident population area within the small and resident population area.

K.3.5.1.2.3 Vessel Strike

As discussed in Section 3.7.3.4.1 (Impacts from Vessels and In-Water Devices), in general, odontocetes, including short-finned pilot whales, move quickly and seem to be less vulnerable to vessel strikes than other cetaceans; however, most small whale and dolphin species have at least occasionally suffered from strikes attributed to small boats and craft such as jet skis.

Odontocetes that occur within the Study Area have varying patterns of occurrence and distribution which overlap with areas where vessel use associated with Navy training and testing activities would occur. Available literature suggests that due to their smaller body size, maneuverability, larger group sizes, and hearing capabilities, most small odontocetes are not likely to be struck by a Navy vessel. Generally, odontocetes are more capable of physically avoiding a vessel strike and since some species occur in large groups, they are more easily seen when they are closer to the water surface.

Some studies established that marine mammals engage in avoidance behavior when surface vessels move toward them. It is not clear whether these responses are caused by the physical presence of a surface vessel, the underwater noise generated by the vessel, or an interaction between the two.

K.3.5.2 Hawaii Island Short-finned Pilot Whales Small and Resident Population Area, Settlement Areas 1-A through 1-D

K.3.5.2.1 Navy Requirements for Area-Specific Training and Testing

The Alenuihaha Channel, as well as the waters north and west of Hawaii Island, provides a unique training capability that does not exist elsewhere in the Hawaii Range Complex. The Alenuihaha Channel is an ideal location for strait transits using mid-frequency active sonar during training. The Alenuihaha Channel is an actual channel that provides a vital and realistic analog for similar straits or restricted maneuvering areas where the Navy operates worldwide, such as the East or South China seas. For example, transit training in the Alenuihaha Channel replicates these types of strait environments that meet the Navy's requirement to deploy Naval forces to ensure the free flow of commerce and the freedom of navigation by combatting piracy or mine threats. Naval forces are required to train to counter a submarine threat before deployment, to ensure such forces obtain the required proficiency to conduct anti-submarine warfare in a controlled and observed environment prior to deployment to international straits across the globe, where operational Commanders require Naval forces to be able to conduct a range of military operations, including anti-submarine warfare. This required proficiency cannot be replicated by simulation and is most effectively obtained when conducted in a strait. Commanding Officers cannot be expected to effectively conduct such operations in a deployed environment if the first time they encounter a submarine in a strait is in a deployed setting. There are few geographic areas that enable forces to do this type of training outside of the HSTT Study Area.

The ability of an aircraft carrier to defend itself from submarine attack with all available assets while conducting straits transits is critical to its survival in forward operating areas. The channel is located outside most of the civilian air traffic corridors approaching the Honolulu International Airport which is necessary to safely de-conflict with civilian air traffic.

While there are other channels within the Hawaii Range Complex used for strait transit training and anti-submarine warfare training, none provide the important attributes of the Alenuihaha Channel. The Alenuihaha Channel's proximity to the Pohakuloa Training Area allows for realistic training and reduces time and fuel costs between these training areas. The channel between Niihau and Kauai is also acceptable from a training perspective, but this would add at least two days of transit during each Under Sea Warfare training exercise (time required to move through a different channel and reposition to operating areas near Pohakuloa Training Area). The Kaiwi Channel between Oahu and Molokai is also acceptable for some mid-frequency active sonar training, but it is also a significant civilian air corridor, and raises safety concerns for anti-submarine warfare aircraft flying in that channel. In addition, the channel between Nihau and Kauai is proximate to the Pacific Missile Range Facility instrumented range which would result in problems de-conflicting multiple activities and hazardous operations, raising safety concerns. For these reasons, Alenuihaha Channel is still the most suitable for anti-submarine warfare training during certain training scenarios.

The Hawaii Island Short-finned Pilot Whales Small and Resident Population is adjacent to waters approaching Kawaihae Harbor, the point of amphibious insertion for forces proceeding to the range at Pohakuloa Training Area, which is the only range in the Hawaii Range Complex that supports ground force and aviation live-fire training. Training in this area allows for the integration of carrier strike group

operations and amphibious landings, working in conjunction within a controlled airspace west of Hawaii Island for military training near the Pohakuloa Training Area range. Carrier strike group training can include a full spectrum of the force ¬ various ships, submarines, aircraft, and Marine Corps forces – to train in the complex command, control operational coordination, and logistics functions designed to prepare forces for deployment. As an air to ground range, Pohakuloa Training Area supports carrier strike group activities near a channel and near large open water areas for strike group maneuvering and submarine activities. Mid-frequency active sonar conducted to support strike maneuver and protect high value units (e.g., carrier) as aircraft go to strike at Pohakuloa Training Area is vital.

Access to both the Alenuihaha Channel and the waters west of Kawaihae Harbor is vital for a broad spectrum of naval and amphibious training. These areas provide a unique and irreplaceable capability within the Hawaii Range Complex that allows naval forces to conduct realistic, integrated training in an environment that replicates the actual areas where they will be called to serve.

Activities utilizing in-water explosives, such as underwater detonations, bombing or torpedo exercises, are not conducted in the nearshore waters within the Short-finned Pilot Whale Small and Resident Population Area since it is not within a designated underwater training range or within Special Use Airspace, typically necessary for in-water explosive usage.

K.3.5.3 Short-finned Pilot Whales Small and Resident Population Area Mitigation Assessment

The identified small and resident population area only takes up a very small portion of the Hawaii Range Complex and is located mostly within nearshore waters where the Navy does not typically conduct activities that involve sonar or other transducers, except where it overlaps with the Alenuihaha Channel. Animals within the short-finned pilot whale small and resident population area could be exposed to sound from sonar or other transducers and some behavioral or temporary impacts could occur from the occasional use of mid-frequency active acoustic sonar during Undersea Warfare training, Independent Deployer Certification training, and Rim of the Pacific training. On the two occasions where research has documented the exposure of short-finned pilot whales to Navy hull-mounted mid-frequency sonar in Hawaii, no behavioral response was observed (Baird et al., 2014a; Mobley & Deakos, 2015).

The Navy has been training and testing in the Hawaiian Islands with the same basic systems for over 40 years and there is no evidence of any adverse impacts having occurred, and there are multiple lines of evidence demonstrating the population's high site fidelity to the area. Research indicates no overt avoidance or discernible behavioral changes when short-finned pilot whale are exposed to sonar activity and the little use of active sonar within the small and resident population area, therefore, it is reasonable to conclude that disruptions to natural behaviors are unlikely to be sustained for a duration long enough that it caused an animal to be outside of normal daily variations in feeding, reproduction, resting, migration/movement, or social cohesion.

The current HSTT settlement agreement prohibits the use of in-water explosives within Areas 1-A through 1-D. However, these areas are not historically used for explosives training and testing; therefore, short-finned pilot whales in the small and resident population areas would not be exposed directly to sound or energy from explosives and impacts would not be anticipated.

While significant long-term impacts on short-finned pilot whales from training and testing with sonar and other transducers or explosives are unlikely to occur within the small and resident population area, the Navy balanced the need for the use of the area to meet training and testing requirements with the biological importance of the area to short-finned pilot whales. The Navy proposes to implement a

mitigation area that overlaps some portions of the Short-finned Pilot Whale Small and Resident Population Area. While this mitigation area is designed to provide additional protection for humpback whales, false killer whales and some beaked whale species, this measure would also reduce the number and level of impacts to these and other species or stocks occurring within the area, including short-finned pilot whales, pygmy killer whales, dwarf sperm whales, melon-headed whales, and dolphin species. The Navy determined that establishing this mitigation area would not compromise military readiness:

Hawaii Island Mitigation Area – limits the amount of surface ship hull-mounted, mid-frequency active sonar (MF1) and dipping sonar (MF4) and restricts the use of explosives during testing, unit level training and major training exercises year-round (Figure K.2-2).

See Section K.2.2 (Mitigation Areas to be Implemented) for more details on the above mitigation area.

As discussed in Section K.3.5.2.1 (Navy Requirements for Area-Specific Training and Testing), due to the strategic importance of the Alenuihaha Channel, the Navy cannot completely prohibit the use of surface ship hull-mounted, mid-frequency active sonar or dipping sonar during training and testing; however, the Navy proposes to limit the amount of surface ship hull-mounted mid-frequency active sonar and dipping sonar used in the channel. The limited use of these sonar systems still allows naval forces to train in an environment that replicates the actual areas where they will be called to serve while likely reducing the number and level of impacts to short-finned pilot whales as well as for other species or stocks occurring within the area without compromising military readiness.

Navy vessels operate differently from commercial vessels in ways that are important to prevent whale collisions. As described in Section 2.3.3 (Standard Operating Procedures), surface ships operated by or for the Navy, have personnel assigned to stand watch at all times, day and night, when a ship or surfaced submarine is moving through the water (underway).

As discussed in Section 3.0.3.3.4.1 (Vessels and In-Water Devices), large Navy ships typically operate at average speeds of between 10 and 15 knots, which for reference is slower than large commercial vessels, such as container ships that steam at approximately 24 knots during normal operations (Maloni et al., 2013). Operating vessels at speeds that are not optimal for fuel conservation or mission requirements would be unsustainable due to increased time on station and increased fuel consumption. Each ship has a limited amount of time that it can be underway based on target service requirements and ship schedules. Ship schedules are driven largely by training cycles, scheduled maintenance periods, certification schedules, and deployment requirements. Because of the complex logistical considerations involved with maintaining ship schedules, the Navy does not have the flexibility to extend the amount of time that ships are underway during training and testing, which would result from vessel speed restriction mitigation. If the Navy were to incorporate vessel speed restrictions into event planning for approximately 3–6 months out of the year, ships would be unable to meet all of their requirements during their limited time available to be underway. This would hold true even if the restrictions only applied to transits to and from training or testing event locations and not during the events themselves. Therefore, it would not be practicable for the Navy to implement speed restrictions within the biologically important areas.

As described in Section 5.3.4.1 (Vessel Movement), additional vessel speed restrictions would prevent vessel operators from gaining handling proficiency, would prevent the Navy from properly testing vessel capabilities, and would increase required the time on station during training or testing events to build skill proficiency or properly test vessel capabilities (which would significantly increase fuel

consumption); therefore, the proposed mitigation would have significant impacts on the Navy's ability to train and test, and would prevent the Navy from meeting its mission requirements.

Available literature suggests that based on their smaller body size, maneuverability, larger group sizes, and hearing capabilities, most odontocetes would be less likely to be struck by a Navy vessel than mysticetes. Generally, odontocetes are more capable of physically avoiding a vessel strike and since some species occur in large groups, they are more easily seen when they are closer to the water surface.

The Navy's standard operating procedures discussed in Section 2.3.3 (Standard Operating Procedures) and ongoing mitigation measures described in Chapter 5 (Mitigation) are designed to avoid or reduce impacts to marine species and stocks throughout the Study Area. These measures would also limit the interaction between Navy vessels and odontocetes, further reducing the potential for vessel strikes in and outside of identified biologically important areas.

K.3.6 Hawaii Island Melon-Headed Whales Small and Resident Population Area

An area with a small and resident population of melon-headed whales (*Peponocephala electra*) off the northwest coast of Hawaii Island has been identified as a year-round biologically important area within the Hawaii Range Complex portion of the HSTT Study Area (Figure K.3-12). This small and resident population area is approximately triangular in shape with an area of approximately 1,750 km^2 off the Kohala coast of Hawaii Island. As shown in Table K.1-1, and described in Section K.1.1.2, (Provisional 2015 Prohibited or Restricted Areas within HSTT Study Area), the Melon-headed Whale Small and Resident Population Area overlaps with HSTT Settlement Areas 1-B through 1-E, and 2-E.The boundary for this biologically important area was based on 545 locations obtained from four satellite-tagged individuals (Baird et al., 2015a). The distance from shore extends from 2 km at its closest point to 47 km at its farthest point. The range of the Kohala resident population is significantly nearer shore and shallower than the Hawaiian Island population of melon-headed whales whose range includes the mid-ocean far from the Hawaiian Islands (Aschettino et al., 2012; Baird et al., 2015a; Carretta et al., 2017).

K.3.6.1 General Biological Assessment

For a thorough description of the melon-headed whale, see Section 3.7.2.3.11 (Melon-headed Whale [*Peponocephala electra*]).

There are two recognized populations (stocks) of melon-headed whales in the Hawaiian Islands (Carretta et al., 2017). These stocks have been defined as: (1) the Kohala resident stock, which consists of resident melon-headed whales off the west coast of Hawaii Island in less than 2,500 m of water, and (2) the Hawaiian Islands stock, which includes melon-headed whales inhabiting waters throughout the U.S. Exclusive Economic Zone of the Hawaiian Islands (Figure K.3-13) (Aschettino et al., 2012; Baird et al., 2015a; Carretta et al., 2017; Oleson et al., 2013).

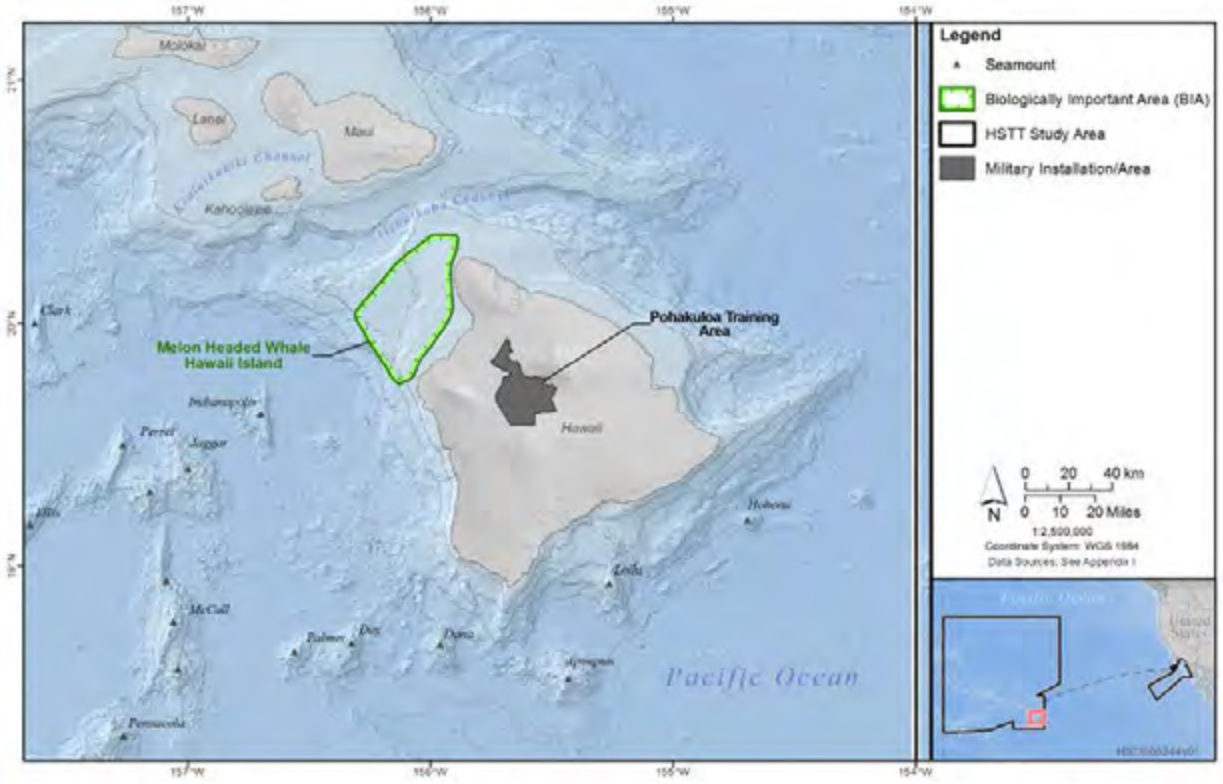


Figure K.3-12: The Small and Resident Population Area Identified for the Kohala Resident Stock of Melon-Headed Whales

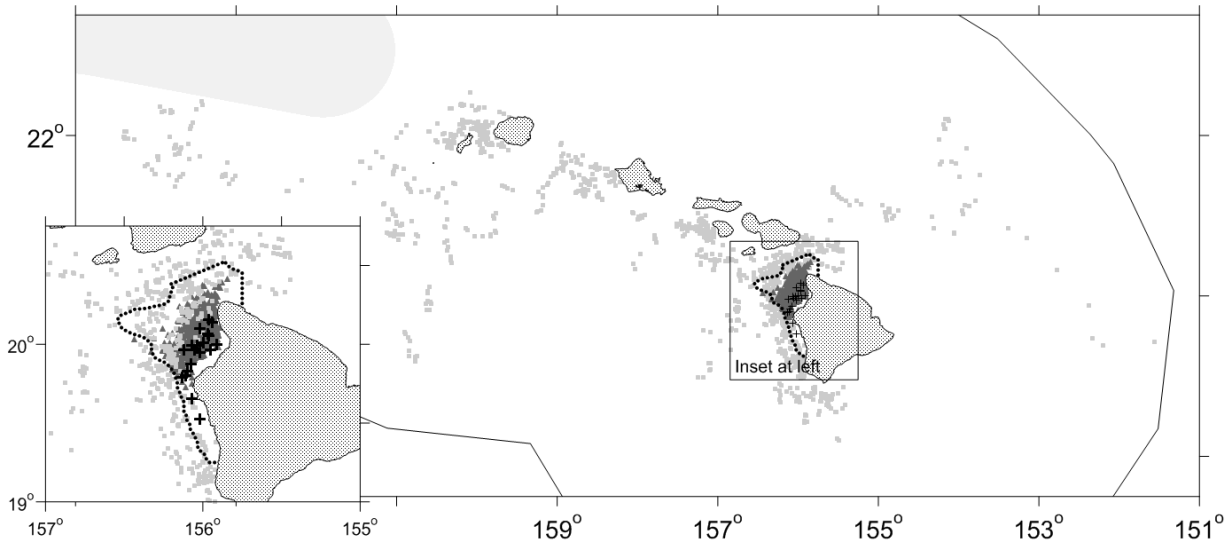


Figure K.3-13: Range of melon-headed whales in the Hawaiian Islands from sighting and telemetry data.

Note: As shown in figure K.3 13, the range of these two stocks of melon-headed whales overlap, although photo-identification and telemetry studies indicate these two populations are demographically-independent with low rates of interchange between them (Aschettino et al., 2012). The Kohala Resident stock satellite telemetry records from four Kohala resident individuals are shown as dark gray triangles, and the Hawaiian Islands stock sightings are shown as light gray squares. Graphic taken from the 2015 Pacific Stock Assessment Report as developed from unpublished data (Carretta et al., 2017). The dotted line around waters adjacent to the northwest and west shores of Hawaii Island represents the provisional stock boundary for the Kohala resident stock (Oleson et al., 2013), the outer line represents U.S. Exclusive Economic Zone and the gray shaded area to the northwest indicates the Papahanaumokuakea Marine National Monument.

K.3.6.1.1 Biological Considerations Applicable to the Melon-Headed Whales Small and Resident Population Area

Based on the record of animals with distinctive markings photographed from 2000 through 2008, there were 310 resightings of 250 individuals indicative of long-term residency to the islands for both the Kohala resident stock off of Hawaii Island and the Hawaiian Islands stock (Aschettino et al., 2012; Carretta et al., 2017). Resightings of individuals have occurred up to 22 years apart for three individual melon-headed whales of the Kohala resident population and up to 13 years apart for the main Hawaiian Islands population, suggesting long-term residency to the islands for both populations. (Aschettino et al., 2012). For melon-headed whales in Hawaii as documented during small boat surveys, the mean group size of approximately 252 suggests they are likely to be detected when present in an area when military readiness activities are being conducted (Baird et al., 2013).

Data from photo-identification, satellite tagging, and genetic studies indicating the presence of a resident population with strong, year-round site fidelity to the nearshore Kohala coast of Hawaii Island supported the identification of the Kohala resident population of melon-headed whales in those waters (Baird et al., 2015a). Because there are only two estimates of abundance available from survey data, no population trend analysis has been possible for either stock of melon-headed whales in Hawaii (Carretta et al., 2017). Although the data only represent a sample of the overall Kohala resident population, a

total of 64 individual whales assigned to that population have been encountered on two or more occasions between 1986 and 2008 off the Island of Hawaii (Aschettino et al., 2012). The long-term documented presence by individual melon-headed whales would seem to indicate there have been no significant impacts on those individuals in the Kohala resident population from the long history of Navy training and testing co-occurring in Hawaii over that same timeframe.

The presence of melon-headed whales has been surmised based on passive acoustic detection of low-frequency whistles south of Oahu, and beyond the identified biologically important area (Klinck et al., 2015). Between December 11, 2014, and January 26, 2015, a passive acoustic survey was conducted in the Hawaii Range Complex using an autonomous glider fitted with an acoustic receiver. The survey began and ended approximately 120 km south of Honolulu, Oahu, navigating a circular track through deep ocean waters that intermittently crossed over or near multiple seamounts. Low-frequency whistles and clicks were detected were likely associated with four species based on the frequency characteristics of the whistles: false killer whale, short-finned pilot whale, melon-headed whale, and rough-toothed dolphin. The whistles were most often detected near bathymetric features (e.g., seamounts) (Figure K.3-11).

K.3.6.1.2 Stressor Analysis

K.3.6.1.2.1 Sonar and Other Transducers

As detailed in Section 3.7.3.1.2 (Impacts from Sonar and Other Transducers), melon-headed whales in Hawaii may be exposed to sound from sonar and other transducers used during training and testing activities throughout the year. Analysis for the entire Hawaii population estimates that all exposures result in behavioral reactions or TTS, and zero exposures resulting in PTS are anticipated. This identified small and resident population area is mostly located within nearshore waters where the Navy does not routinely conduct anti-submarine warfare activities that involve sonar or other transducers, especially more intense activities such as anti-submarine warfare training or major training events. While impacts on pygmy killer whale natural behaviors due to training and testing with sonar and other transducers may occur within the small and resident population area, they unlikely rise to the level of significant under NEPA nor would they be sustained for a duration long enough to cause an animal to be outside of normal daily variations in feeding, reproduction, resting, migration/movement, or social cohesion. Any TTS in the biologically important areas would be minor to moderate, from which the individual would fully recover quickly.

K.3.6.1.2.2 Explosives

As discussed in Section 3.7.3.2.2 (Impacts from Explosives), most activities that involve underwater detonations and explosive munitions typically occur more than 3 NM from shore in areas that are designated for explosive use. Historical data suggests that explosive events are most likely to be scheduled at Puuloa Underwater Training Range, W-188, or KAPU HOT in W-192 south of Oahu (Figure K.3-3) for ease of scheduling, safety, instrumentation, and airspace concerns. These areas are outside of the melon-headed whale small and resident population area.

The biologically important area is mostly located within nearshore waters and is not within a designated underwater training range nor within Special Use Airspace, typically necessary for in-water explosive usage. Quantitative acoustic analysis estimates only a single TTS and a behavioral reaction from exposure to explosives through the entire Study Area, so it is very unlikely that sound from explosives

would expose animals within the melon-headed whale small and resident population area; therefore, no impacts on behavior would occur from this stressor.

K.3.6.1.2.3 Vessel Strike

As discussed in Section 3.7.3.4.1 (Marine Mammals, Impacts from Vessels and In-Water Devices), in general, odontocetes, including melon-headed whales, move quickly and seem to be less vulnerable to vessel strikes than other cetaceans; however, most small whale and dolphin species have at least occasionally suffered from strikes attributed to small boats and craft such as jet skis.

Odontocetes that occur within the Study Area have varying patterns of occurrence and distribution which overlap with areas where vessel use associated with Navy training and testing activities would occur. Available literature suggests that due to their smaller body size, maneuverability, larger group sizes, and hearing capabilities, most small odontocetes are not likely to be struck by a Navy vessel. Generally, odontocetes are more capable of physically avoiding a vessel strike and since some species occur in large groups, they are more easily seen when they are closer to the water surface.

Some studies established that marine mammals engage in avoidance behavior when surface vessels move toward them. It is not clear whether these responses are caused by the physical presence of a surface vessel, the underwater noise generated by the vessel, or an interaction between the two.

K.3.6.2 Hawaii Island Melon-headed Whale Small and Resident Population Area, Settlement Areas 1-B through 1-E, and 2-E

K.3.6.2.1 Navy Requirements for Area-Specific Training and Testing

The Alenuihaha Channel, as well as the waters north and west of Hawaii Island, provides a unique training capability that does not exist elsewhere in the Hawaii Range Complex. The Alenuihaha Channel is an ideal location for strait transits using mid-frequency active sonar during training. The Alenuihaha Channel is an actual channel that provides a vital and realistic analog for similar straits or restricted maneuvering areas where the Navy operates worldwide, such as the East or South China seas. For example, transit training in the Alenuihaha Channel replicates these types of strait environments that meet the Navy's requirement to deploy Naval forces to ensure the free flow of commerce and the freedom of navigation by combatting piracy or mine threats. Naval forces are required to train to counter a submarine threat before deployment, to ensure such forces obtain the required proficiency to conduct anti-submarine warfare in a controlled and observed environment prior to deployment to international straits across the globe, where operational Commanders require Naval forces to be able to conduct a range of military operations, including anti-submarine warfare. This required proficiency cannot be replicated by simulation and is most effectively obtained when conducted in a strait. Commanding Officers cannot be expected to effectively conduct such operations in a deployed environment if the first time they encounter a submarine in a strait is in a deployed setting. There are few geographic areas that enable forces to do this type of training outside of the HSTT Study Area.

The ability of an aircraft carrier to defend itself from submarine attack with all available assets while conducting straits transits is critical to its survival in forward operating areas. The channel is located outside most of the civilian air traffic corridors approaching the Honolulu International Airport which is necessary to safely de-conflict with civilian air traffic.

While there are other channels within the Hawaii Range Complex used for strait transit training and anti-submarine warfare training, none provide the important attributes of the Alenuihaha Channel. The Alenuihaha Channel's proximity to the Pohakuloa Training Area allows for realistic training and reduces

time and fuel costs between these training areas. The channel between Niihau and Kauai is also acceptable from a training perspective, but this would add at least two days of transit during each Under Sea Warfare training exercise (time required to move through a different channel and reposition to operating areas near Pohakuloa Training Area). The Kaiwi Channel between Oahu and Molokai is also acceptable from some mid-frequency active sonar training perspective, but it is also a significant civilian air corridor, and raises safety concerns for anti-submarine warfare aircraft flying in that channel. In addition, the channel between Nihau and Kauai is proximate to the Pacific Missile Range Facility instrumented range) which would result in problems de-conflicting multiple activities and hazardous operations, raising safety concerns. For these reasons, Alenuihaha Channel is still the most suitable for anti-submarine warfare training during certain training scenarios. The Hawaii Island Melon-headed Whale Small and Resident Population Area is adjacent to waters approaching Kawaihae Harbor, the point of amphibious insertion for forces proceeding to the range at Pohakuloa Training Area, which is the only range in the Hawaii Range Complex that supports ground force and aviation live-fire training. Training in this area allows for the integration of carrier strike group operations and amphibious landings, working in conjunction within a controlled airspace west of Hawaii Island for military training near the Pohakuloa Training Area range. Carrier strike group training can include a full spectrum of the force–various ships, submarines, aircraft, and Marine Corps forces—to train in the complex command, control operational coordination, and logistics functions designed to prepare forces for deployment. As an air to ground range, Pohakuloa Training Area supports carrier strike group activities near a channel and near large open water areas for strike group maneuvering and submarine activities. Mid-frequency active sonar conducted to support strike maneuver and protect high value units (e.g., carrier) as aircraft go to strike at Pohakuloa Training Area is vital.

Access to both the Alenuihaha Channel and the waters west of Kawaihae Harbor is vital for a broad spectrum of naval and amphibious training. These areas provide a unique and irreplaceable capability within the Hawaii Range Complex that allows naval forces to conduct realistic, integrated training in an environment that replicates the actual areas where they will be called to serve.

Activities utilizing in-water explosives, such as underwater detonations, bombing or torpedo exercises, are not conducted in the nearshore waters within the Melon-headed Whale Small and Resident Population Area since it is not within a designated underwater training range or within Special Use Airspace, typically necessary for in-water explosive usage.

K.3.6.3 Melon-Headed Whale Small and Resident Population Area Mitigation Assessment

The identified small and resident population area for melon-headed whales only takes up a very small portion of the Hawaii Range Complex and is located within nearshore waters where the Navy does not typically conduct activities that involve sonar or other transducers, especially more intense activities such as anti-submarine warfare training or major training events. However, animals within the Melon-headed Whale Small and Resident Population Area could be exposed to sound from sonar or other transducers, and some behavioral or temporary impacts could occur from the occasional use of mid-frequency active sonar during Undersea Warfare training, Independent Deployer Certification training, and Rim of the Pacific training. Predicted effects on individuals in the population are expected to be behavioral in response to the use of sonar and other transducers (see Appendix E, Estimated Marine Mammal and Sea Turtle Impacts from Exposure to Acoustic and Explosive Stressors Under Navy Training and Testing Activities). The most likely behavioral response (if any) by an individual melon-headed whale would be to avoid a sound source. Model predicted behavioral (and other) effects are based on

precautionary criteria and thresholds and it is likely the exposures would have little to no biological consequence. In such cases where behavioral effects on individual animals are at most minor and temporary, and no population level effects are expected.

The Navy balanced the need for the use of the area to meet training and testing requirements with the biological importance of the area to melon-headed whales and other species and proposes to implement a mitigation area that overlaps some portions of the Small and Resident Population Area. While this mitigation area is designed to provide additional protection for humpback whales, false killer whales and beaked whale species, this measure would also reduce the number and level of impacts to these and other species or stocks occurring within the area, including pygmy killer whales, dwarf sperm whales, melon-headed whales, short-finned pilot whales, and dolphin species. The Navy determined that establishing this mitigation area would not compromise military readiness:

Hawaii Island Mitigation Area – limits the amount of surface ship hull mounted mid-frequency active sonar (MF1) and dipping sonar (MF4) and restricts the use of explosives during testing, unit-level training, and major training exercises year-round (Figure K.2-2).

See Section K.2.2 (Mitigation Areas to be Implemented) for more details on the above mitigation area.

As discussed in Section K.3.6.2.1 (Navy Requirements for Area-Specific Training and Testing), due to the strategic importance of the Alenuihaha Channel, the Navy cannot completely prohibit the use of surface ship hull-mounted mid-frequency active sonar or dipping sonar during training and testing; however, the Navy proposes to limit the amount of surface ship hull-mounted mid-frequency active sonar and dipping sonar used in the channel. The limited use of these sonar systems still allows naval forces to train in an environment that replicates strategic straits to which they will operate while likely reducing the number and level of impacts to melon-headed whales as well as for other species or stocks occurring within the area without compromising military readiness.

Navy vessels operate differently from commercial vessels in ways that are important to prevent whale collisions. As described in Section 2.3.3 (Standard Operating Procedures), surface ships operated by or for the Navy, have personnel assigned to stand watch at all times, day and night, when a ship or surfaced submarine is moving through the water (underway).

Available literature suggests that based on their smaller body size, maneuverability, larger group sizes, and hearing capabilities, most odontocetes would be less likely to be struck by a Navy vessel than mysticetes. Generally, odontocetes are more capable of physically avoiding a vessel strike and since some species occur in large groups, they are more easily seen when they are closer to the water surface.

Mitigation measures described in Chapter 5 (Mitigation) are designed to avoid or reduce impacts to marine species and stocks throughput the Study Area. These measures would also limit the interaction between Navy vessels and odontocetes, further reducing the potential for vessel strikes in and outside of identified biologically important areas.

K.3.7 Common Bottlenose Dolphins Small and Resident Population Areas: Hawaiian Islands Stock Complex

Four areas with small and resident populations of bottlenose dolphins (*Tursiops truncatus*) off the coast of the main Hawaiian Islands have been recognized as year-round biologically important areas (Figure K.3-14) (Baird et al., 2015a). These resident populations reflect four of the five stocks making up the Hawaiian Islands Stock Complex (Carretta et al., 2017). Together these areas cover approximately 21,920 km^2 of water space in the main Hawaiian Islands. The areas were identified based on data from photo-

identification, satellite tagging, and genetic analyses. The boundary of the small and resident population area is defined by the 1000 m isobaths, coincident with the stock boundaries (Baird et al., 2015a). As shown in Table K.1-1, and described in Section K.1.1.2 (Provisional 2015 Prohibited or Restricted Areas within HSTT Study Area), the Common Bottlenose Dolphin Small and Resident Population Area overlaps with HSTT Settlement Areas 1-A through 1-E and 2-A through 2-E.

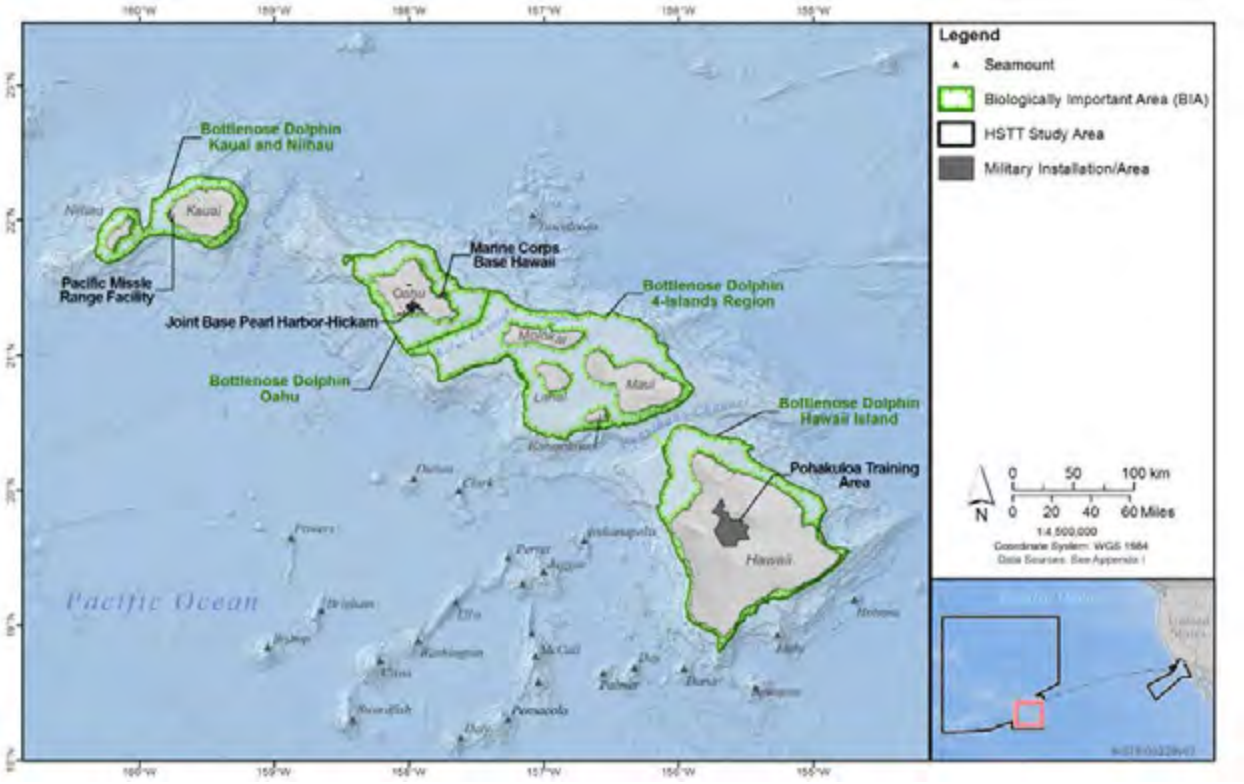


Figure K.3-14: Bottlenose Dolphin Small and Resident Population Area

K.3.7.1 General Biological Assessment

For a thorough description of the common bottlenose dolphin species, see Section 3.7.2.3.14 (Common Bottlenose Dolphin [*Tursiops truncatus*]).

Available photo-identification, genetic, and tagging data suggest that there are four separate small populations of bottlenose dolphins that are resident in the main Hawaiian Islands.

K.3.7.1.1 Biological Considerations Applicable to all Common Bottlenose Dolphins Small and Resident Population Areas

The biologically important areas for bottlenose dolphins were created based on evidence of year-round habitat use by resident populations. Visual surveys conducted from 2000 to 2012 obtained 227 sightings of bottlenose dolphins within the main Hawaiian Islands and revealed that they were primarily found in depths of 1000 m or less (Baird et al., 2013c). Photo-identification data from 2000 to 2013 recorded 272 encounters with bottlenose dolphins and a total of 509 unique identifications; all but two individuals stayed within the boundaries of the specific island areas (Baird et al., 2013c).

Individuals were generally distributed in shallow water areas and numerous resightings suggest individuals were residents rather than part of an offshore population moving through the area. There

were movements from Kauai to Niihau and among the four islands of the 4-Islands Region, but there was no evidence of movements between island groups (Kauai and Niihau, Oahu, 4-Islands Region and Hawaii Island). Genetic samples collected near Palmyra Atoll provide evidence of a genetically distinct pelagic population, which visits the Hawaiian Islands offshore waters (Martien et al., 2012) but is not resident.

The high resighting rates around the separate island areas suggest that each resident population is demographically independent and associated with a specific island area, and that there is no intermingling between the four island-associated populations (Baird et al., 2009a). Genetic analysis of biopsy samples shows that there is genetic differentiation between, and low dispersal rates among, the four island-associated populations (Martien et al., 2012). Nine individuals, from three of the four insular stocks, were satellite tagged, and results showed that each stayed within the NMFS stock assessment boundaries (Baird et al., 2013b). Individuals were tagged off Kauai, Lanai, and Hawaii, but no individuals were tagged off of Oahu. Although most visual survey and tagging effort took place on the leeward side of the islands, satellite tagging results showed that individuals used both the leeward and windward sides of Kauai and Lanai (Baird et al., 2013b). Additional satellite tagging data is needed to show the full extent of habitat use for the eastern side of Hawaii Island, the eastern half of Maui, and the northern side of Molokai. Synthesizing tracks from eight tags over several years, Baird created a map of common bottlenose density around Kauai indicating possible “core range” areas on the west and northeast coasts (Baird et al., 2015b). These eight animals were not, however, identified as part of the small and resident population.

Demographic differences among bottlenose dolphins can influence habitat selection, and, therefore, resource use. Results from an examination of resource use by dolphins in Florida of different ages and sexes showed females had the most varied use of resources, males least varied, and juveniles were somewhere in the middle (Rossman et al., 2015). Variation of resource use between different demographic groups of dolphins can have a large effect on the viability of the species especially in areas close to human activity and disturbance. For instance, if the habitat upon which juveniles depend is made less viable due to disturbance from human activity, then there could be an impact on the future development of the population. On the other hand, differential habitat use between assemblages could result in increased viability and a more robust population. If a preferred habitat were lost, the population could survive or even thrive in another, similar habitat even if that habitat was underutilized previously. The differences in resource use patterns for bottlenose dolphins likely resulted from trade-offs between social interactions, predator avoidance, energetic needs based on body size, activity levels, and reproductive condition (Rossman et al., 2015).

Hartel et al. (2015) suggests management mechanisms to protect dolphin populations from these impacts. Instead of static management boundaries, the research indicates that it would be worthwhile to consider dynamic protection zones or activity-based, non-spatial management measures. These adaptive management mechanisms are more conducive to managing a population that is highly dynamic. This type of management boundary may be more effective in managing impacts from human disturbance on a dynamic small and resident population of bottlenose dolphins than a geographically delineated management area, based on the results of Hartel et al. (2015).

K.3.7.2 Stressor Analysis

K.3.7.2.1 Sonar and Other Transducers

As detailed in Section 3.7.3.1.2 (Impacts from Sonar and Other Transducers), common bottlenose dolphins in Hawaii may be exposed to sound from sonar and other transducers used during training and testing activities throughout the year. Analysis for the entire Hawaii population estimates that all exposures result in behavioral reactions or mild to moderate TTS, and zero exposures at levels of PTS are anticipated. The identified small and resident population areas are mostly located within shallow, nearshore waters. While impacts on common bottlenose dolphin natural behaviors due to training and testing with sonar and other transducers may occur within the small and resident population areas, they are unlikely to rise to the level of significant under NEPA nor would they be sustained for a duration long enough that it caused an animal to be outside of normal daily variations in feeding, reproduction, resting, migration/movement, or social cohesion. Any TTS in the biologically important areas would be minor to moderate, from which the individual dolphin would fully recover quickly.

K.3.7.2.2 Explosives

As detailed in Section 3.7.3.2.2 (Impacts from Explosives), common bottlenose dolphins in Hawaii may be exposed to sound and energy from explosives used during training and testing activities throughout the year. Analysis for the entire Hawaii population estimates that most exposures result in behavioral reactions or TTS. Any TTS in the biologically important areas would be minor to moderate, from which the individual dolphin would fully recover quickly. A single PTS is modeled off Oahu. PTS could have minor long-term consequences for individuals.

The identified small and resident population areas are mostly located within shallow, near-shore waters where the Navy does not typically conduct activities that involve explosives outside of designated ranges. Most activities that involve underwater detonations and explosive munitions typically occur more than 3 NM from shore with the exception of those activities occurring in underwater ranges that are designated for explosive use, such as the Puuloa Underwater Training Range.

Historical data suggests that larger explosive events, such as gunnery, bombing or torpedo exercises, are most likely to be scheduled in W-188 or KAPU HOT located in W-192 south of Oahu (Figure K.3-6) for ease of scheduling, safety, availability of instrumentation, and airspace concerns. However, animals within the Common Bottlenose Dolphin Whale Small and Resident Population Area could be exposed to energy from explosives, and some behavioral or temporary impacts could occur from the occasional use of explosives during unit-level training and testing. A single PTS is modeled for this species in this area, but potential biological removal for this stock is 4.9.

Standard mitigation is implemented during explosives training and testing which includes use of lookouts and mitigation zones sized based on activity making it unlikely that an animal at the surface would be affected. While impacts on common bottlenose dolphins' natural behaviors due to training and testing with explosives may occur within the small and resident population areas, they are unlikely to rise to the level of significant under NEPA nor would they be sustained for a duration long enough that it caused an animal to be outside of normal daily variations in feeding, reproduction, resting, migration/movement, or social cohesion.

K.3.7.2.3 Vessel Strike

As discussed in Section 3.7.3.4.1 (Impacts from Vessels and In-Water Devices), in general, odontocetes, including bottlenose dolphins, move quickly and seem to be less vulnerable to vessel strikes than other

cetaceans; however, most small whale and dolphin species have at least occasionally suffered from strikes attributed to small boats and craft such as jet skis.

Odontocetes that occur within the Study Area have varying patterns of occurrence and distribution which overlap with areas where vessel use associated with Navy training and testing activities would occur. Available literature suggests that due on their smaller body size, maneuverability, larger group sizes, and hearing capabilities, most small odontocetes are not likely to be struck by a Navy vessel. Generally, odontocetes are more capable of physically avoiding a vessel strike and since some species occur in large groups, they are more easily seen when they are closer to the water surface.

Some studies established that marine mammals engage in avoidance behavior when surface vessels move toward them. It is not clear whether these responses are caused by the physical presence of a surface vessel, the underwater noise generated by the vessel, or an interaction between the two.

K.3.7.3 Kauai and Niihau Common Bottlenose Dolphins Small and Resident Population Area

K.3.7.3.1 Navy Requirements for Area-Specific Training and Testing

The Kaulakahi Channel contains shallow water portions of the Pacific Missile Range Facility, a multi-dimensional range that is a heavily used training and testing area. The Common Bottlenose Dolphin Small and Resident Population Area around Kauai and Niihau fully overlaps restricted area R-3101, and overlaps significant portions of the Barking Sands Tactical Underwater Range and the Shallow Water Training Range. It also overlaps portions of special use airspace W-188(A) and W-186 (W-188[A] and W-186).

The Pacific Missile Range Facility is the largest instrumented multi-environment test range in the world and includes land, sea, and air zones. The Battle Management Interoperability Center contains the operational systems necessary to communicate and coordinate the complex activities involved in live-fire testing and training. The existing infrastructure is unique and irreplaceable, providing a full spectrum of range support, including radar, underwater instrumentation (e.g., bottom-mounted transducers and hydrophones), telemetry, electronic warfare, remote target command and control, communications, data display and processing, and target⁄weapon launching and recovery facilities. The Barking Sands Tactical Underwater Range provides underwater tracking and communication for an area of approximately 100 NM, and the Shallow Water Training Range covers 80 NM.

Both the Barking Sands Tactical Underwater Range and the Shallow Water Training Range are regularly used for Anti-submarine Warfare, Anti-submarine Tracking Exercise, Anti-submarine Torpedo Exercise, and Anti-submarine coordinated exercises like Submarine Commander Course and Rim of The Pacific, while the Barking Sands Tactical Underwater Range is specifically used for Naval Surface Fire Support. These ranges provide operators with a shallow-water sonar training area to conduct shallow-water sonar proficiency training and readiness activities under realistic conditions on an instrumented range. Amphibious assault tactics are also conducted at Barking Sands on the Pacific Missile Range Facility.

Mine-laying events are designed to train forces to conduct offensive (deploying mines to tactical advantage of friendly forces) and defensive (deploying mines for protection of friendly forces and facilities) mining events. Aerial mining occurs off the southwest coast of Kauai and the southeast coast of Niihau, in W-186 and W-188. Submarine mining events are conducted in W-188. Air Operations are conducted within R-3101. Inert mine shapes may be released into the ocean during these training events. W-188 is used for a variety of anti-air warfare and surface warfare exercises including missile

and gunnery exercises, however, only small nearshore portions of W-188(a) and W-186 overlap with the Common Bottlenose Dolphin Small and Resident Population Area around Kauai and Niihau.

The Pacific Missile Range Facility supports training, tactics development, and testing of air, surface, and subsurface weapons systems for the Navy. The instrumentation on the ranges yields a 10 ft. tracking accuracy, which is crucial for reconstruction, grading and feedback on events. This maximizes the value of available training and testing opportunities. Because of its unique infrastructure and un-encroached geographic range, it is also the lead range for a variety of testing and evaluation events. Ongoing testing and evaluation programs include torpedo, torpedo defense, submarine and periscope detection, ship-defense systems, and other miscellaneous programs (such as gunnery and special weapons tests).

Explosives may be used for some specific training and testing events on the ranges or in W-188 and W-186, though much of the explosives use in the warning areas is conducted further offshore in waters that do not overlap with the biologically important area. The remainder of the common bottlenose dolphin small and resident population area around Kauai and Niihau that lies outside of Kaulakahi Channel and Navy ranges is not as commonly used for training and testing. None of the specific training and testing areas around Kauai and Niihau are within the Hawaiian Islands Humpback Whale National Marine Sanctuary.

K.3.7.3.2 Kauai and Niihau Common Bottlenose Dolphins Small and Resident Population Area Mitigation Considerations

The training and testing activities at the Pacific Missile Range Facility would be significantly less effective and potentially impossible if conducted elsewhere without the feedback and communication provided by range instrumentation. The combination of the existing range infrastructure and adjacent controlled air, land, and sea zones that include shallow water, a channel, and un-encroached deep water cannot be replicated in other locations. Events or portions of events that require quantitative evaluation or specific range support infrastructure in shallow water could not be conducted in other areas of the Hawaii Range Complex. Anti-submarine warfare events and training could not be fully reconstructed and graded to determine outcomes if these activities were conducted off the range. Shallow water testing events may specifically require the range support services and instrumentation provided by the ranges in order to meet their primary objectives.

The population area encompasses almost the entirety of the Shallow Water Training Range and nearly half of the Barking Sands Tactical Underwater Range. Confining activities to only the portions of the ranges that lie outside the population area would limit the sea space available to maneuver in a realistic way as required by tactics and to de-conflict when multiple platforms are present. Ships require sea space for safety of navigation, appropriate stand-off ranges when deploying weapons, and to prevent mutual interference between sonar and electronic emissions. Given the large areas of overlap, training would be impractical, unrealistic, and ineffective if this sea space was unavailable. Limiting or prohibiting the use of sonar on the ranges would not allow anti-submarine warfare events that require the ranges to meet their mission objectives.

While the use of non-explosive mine shapes is generally limited to areas greater than 600 ft. in depth, certain testing events may require that mines are placed in shallower areas. Restricted Area 3101 is the only location designated in the Hawaii Range Complex for airborne mine laying. Before dropping inert exercise mines, the crew visually determines that the area is clear. Although the altitude at which inert exercise mines are dropped varies, the potential for drift during descent generally favors release at lower altitudes, where visual searches for marine mammals are more effective. When the inert exercise

mine is released, a small parachute retards its entry into the ocean. The mine can be designed to float on the surface or near surface or to sink on a tether. Ultimately the mine sinks carrying the parachute with it. Standard Navy procedures are followed for the deployment of inert mines from submarines. There are no known instances of a Navy mine striking any species of marine mammal.

Common bottlenose dolphins are one of the most frequently encountered odontocete species in the Pacific Missile Range Facility, and tagging data from Navy's Marine Species Monitoring program from 2011-2014 shows regular use of all the ranges (Baird et al., 2015b; Moretti & Baird, 2015). Navy's Marine Species Monitoring Program and the Marine Mammal Monitoring on Navy Ranges program use real -time passive acoustic monitoring that takes advantage of existing range instruments and other technologies to research a variety of questions including what, if any, are the short-term behavioral responses of marine mammal species when exposed to sonar or explosions at different levels/conditions, and what is the occurrence and estimated received level of sonar.

The Navy marine mammal research program is actively working to understand the effects of sound on marine mammals, including physiological, behavioral and ecological effects, and supports development of improved marine mammal monitoring and detection technology and overall knowledge about marine mammals. A bottlenose dolphin tagged on the Pacific Missile Range Facility during Submarine Commander's Course in 2013 showed no large-scale movements out of the area during sonar exposures despite proximity to the vessels using mid-frequency active sonar, and relatively high predicted received sound levels (149–168 dB) (Baird et al., 2014b). The ranges in Kaulakahi Channel overlap with what has been identified as possibly part of the population's "core range" (Baird et al., 2015a). Despite the long history of Navy training and testing on these ranges, the island-associated population shows site fidelity and appears to be stable.

Animals within the Kauai and Niihau common bottlenose dolphin Small and Resident Population Area could be exposed to sound from sonar or other transducers and sound and energy from explosives, and some behavioral or temporary impacts could occur from the occasional use of mid-frequency active sonar and explosives during training and testing events at the Pacific Missile Range Facility. The most likely behavioral response (if any) by an individual animal would be to avoid a sound source. Satellite tracking data from tagged bottlenose dolphins have shown that they routinely occur on all sides of Kauai Island (Baird et al., 2016b) suggesting that movement from an area where sonar is in use to another portion of their habitat would be within their normal range of behavior and of little or no biological consequence. In such cases where behavioral effects on individual animals are at most minor and temporary, and no population level effects are expected, introducing geographic mitigation would not be effective at reducing adverse impacts on the population. Additionally, model predicted behavioral (and other) effects are based on precautionary criteria and thresholds. Observations of bottlenose dolphin behavior during Navy training events using sonar off Kauai have not shown the dolphins avoiding the sound source or exhibiting adverse impacts (Baird et al., 2014b). Given limited or no observed adverse effects, minimal predicted behavioral effects on individual animals, and no indication of population level effects, implementing geographic mitigation requiring the Navy to avoid biologically important areas would not be effective at further reducing adverse impacts on a population of marine mammals.

Reducing or limiting Navy training and testing in the Kauai and Niihau area as part of geographic mitigation would not be practicable and would compromise personnel safety and reduce the effectiveness of training and testing. One of the primary purposes of the Navy's instrumented range at

Kauai is to facilitate a safe training and testing environment for surface vessels and submarines operating simultaneously by acoustically tracking event participants. The instrumented range also enhances the effectiveness of training and testing by enabling the managers overseeing the event to direct participants into specific tactical interactions. Navy training and testing events may require vessels to move around Kauai and Niihau and through the channel separating the islands as an integral part of tactical scenario. Training realism cannot be achieved if pieces of the ocean environment and nearshore waters around the islands of Kauai and Niihau are unavailable for full tactical consideration due to geographic mitigation.

K.3.7.4 4-Islands Region Common Bottlenose Dolphins Small and Resident Population Area, Settlement Areas 2-A through 2-C

The 4-Islands Region common bottlenose dolphin small and resident population area incorporates waters around Maui, Molokai, Lanai, and Kahoolawe out to 1,000 m depth, except between Molokai and Oahu, where the boundary runs approximately equidistant between the 500 m isobaths around Oahu and the 4-Islands Region, through the middle of Kaiwi Channel. This population area overlaps with Settlement Areas 2-A through 2-C. It overlaps with a portion of the Hawaiian Islands Humpback Whale National Marine Sanctuary, the Humpback Whale Cautionary Area, and a Humpback Whale Special Reporting Area.

K.3.7.4.1 Navy Requirements for Area-Specific Training and Testing

The 4-Islands Region provides an environment for anti-submarine warfare search, tracking and avoidance of opposing anti-submarine warfare forces. The bathymetry provides unique attributes and unmatched opportunity to train in searching for submarines in shallow water. Littoral training allows units to continue to deploy improved sensors or tactics in littoral waters. In the Hawaii portion of the HSTT Study Area specifically, anti-submarine warfare training in shallow water is vitally important to the Navy since diesel submarines typically hide in that extremely noisy and complex marine environment (Arabian Gulf, Strait of Malacca, Sea of Japan, and the Yellow Sea all contain water less than 200 m deep). There is no other area in this portion of the HSTT Study Area with the bathymetry and sound propagation analog to seas where Navy conducts real operations that this training could relocate to. The Navy cannot conduct realistic shallow water training exercises without training in and around the 4-Islands Region. In addition, this area includes unique shallow water training opportunities for unit-level training, including opportunity to practice operations in littoral areas that are both shallow, and navigationally constrained, and in close proximity to deeper open ocean environments.

Penguin Bank particularly is used for shallow water submarine testing and anti-submarine warfare training because of its large expanse of shallow bathymetry. While submarines do not typically use mid-frequency active sonar, relying primarily on passive sonar (listening mode) to avoid detection from adversaries, submarines are required to train in counter detection tactics, techniques and procedures against threat surface vessels, airborne anti-submarine warfare units and other threat submarines using mid-frequency active sonar as part of both their perspective Commanding Officers qualification course and pre-deployment certification.

The ability for surface vessels and air assets to simulate opposing forces, using mid-frequency active sonar when training with submarines, is critical to submarine crew training for deployed and combat operations. Surface ships and aircraft mimicking opposition forces present submarines with a realistic and complicated acoustic and tactical environment. The Navy expects real-world adversaries to target our submarines with active sonar. Without active sonar from opposition forces submarines don't get a

realistic picture regarding if they successfully evaded detection. Surface warfare training is designed to support unit-level training requirements and group cross-platform events in 28 mission areas for surface ship certification prior to deployment. The Required Operational Capabilities and Required Operational Environment guidance outlines anti-submarine warfare areas specifically requiring crews to accomplish 58 major tasks to support both deep and shallow water anti-submarine training activities, across multiple domains of the open ocean and littoral areas, while conducting unit and group self-defense training across multiple platforms and defensive operations. The Navy expects real-world adversaries to target our submarines with active sonar Submarine Command Course training is conducted twice a year in Hawaii, in February and August, (with the intermittent use of active sonar over a 3¬5-day-period per event). Submarine Command Course training is a Medium Coordinated Anti-Submarine Warfare Training exercise (see Table 2.3-2). The 4-Islands Region is used for Submarine Command Course training as a location to train prospective Submarine Commanding Officers to operate in shallow water.

The Pailolo and Kalohi Channels are used to simulate strait transits and provide valuable experience that the prospective Commanding Officers would experience while deployed. The Pailolo and Kalohi Channels are used to simulate strait transits and provide realistic shallow water environments for qualification of prospective Commanding Officers. For example, conducting shallow water anti-submarine warfare training in a deep water environment while simulating fathometer readings would develop bad habit patterns of ignoring the critical depth aspect of the training, and in a real world situation, those readings may possibly be ignored as well, and thereby jeopardizing safety and survival of the ship and crew. Training in actual shallow water conditions is mandatory to develop proper crew coordination and tactics, techniques and procedures to ensure mission success. Additionally, training in the shallow water environment is essential for crews to experience the effect of bottom topography, (upslope and downslope) on sonar transmission and returns for detecting threat targets in different advantageous positions. The winter (February) Submarine Command Course training will typically occur north of Maui to avoid typical whale reproduction areas from December to April. Many of the real-world straits of interest where submarines deploy are similarly high-contact and acoustically challenging environments.

Surface vessels and air assets work with submarines in that area while conducting submarine Commanding Officer's training scenarios that include extended shallow water operations at periscope depth, general surveillance missions in shallow water, shallow water weapons employment, close to shore navigation, shallow water minefield operations, and shallow water ship control. Such training evolutions are necessary for the Commanding Officer to learn the skills necessary, while protecting the vessel, to ensure the crew are capable of executing their mission.

Additionally, the 4-Islands Region possesses other attributes which make it an important area for anti-submarine and mine warfare training and testing:

- The Hull Integrity Testing Site is used infrequently throughout the year for post major maintenance controlled dives to test depth. This deep water range located off the northwest coast of Kahoolawe is unique and provides the necessary bathymetry to support maintenance testing and certification. A surface ship is required to escort the submarine for this type of testing.
- Kahoolawe Minefield is utilized by submarine crews and during Submarine Commander's Course certification training for mine counter measure training and certification. Mine counter measure training is typically less than one day and does not involve the use of mid-frequency active sonar

by the submarine. The mine warfare range contains multiple bottom and tethered mine shapes in shallow water. Instrumentation provides submerged submarine positioning with Submerged Acoustic Navigation System buoys.

- Hawaii Area Tracking System, a non-instrumented range, is used by submarine crews and during Submarine Command Course certification training for anti-submarine warfare missions involving the employment of advance capability torpedoes (exercise torpedoes) in a challenging shallow water and bottom type environment. These torpedoes are non-explosive and are recovered. The areas of deep water in the Hawaii Area Tracking System located off the northwest coast of Kahoolawe provide challenging bathymetry to support submarine post-major maintenance testing and certification. The Hawaii Area Tracking System is also used by submarine crews during Submarine Commander's Course certification training on anti-submarine warfare and surface warfare missions.
- Expeditionary warfare training is conducted on the west coast of Maui—no explosives are used—which includes swimmers getting to a beach with small boats where access is limited.
- Unit level anti-submarine warfare training during the basic phase is conducted within this area.
- Insertion and extraction utilizing small submersible vessels and small boats (rigid-hulled inflatable boats and zodiacs) is conducted around the waters off Maui.

This area provides a unique and highly important shallow water training environment in which units can practice operations in littoral areas that are both shallow and navigationally constrained. This network of shallow water inter-island channels is unique within the Eastern and Mid Pacific training range complexes. The area provides an unmatched opportunity for submarines to train in shallow water without the need to use active sonar during their searches. Training in these littoral areas will allow fleet units to continue to deploy improved sensors and tactics in littoral waters into the future. In general, for the Hawaii Range Complex, pushing anti-submarine warfare training further from land and out of the littorals would add transit time (increased fuel and loss of training time).

The current HSTT settlement agreement prohibits the use of in-water explosives within Areas 2-A through 2-C, which overlap with the common bottlenose dolphin small and resident population area. These areas are not historically used for explosives training and testing; however, the Maui Basin north of Kahului has been used for shallow water non-explosive torpedo training. Non-explosive exercise torpedo firing could also be scheduled in the area between Maui, Lanai, and Kahoolawe only for summer training (August). For the winter training (February) exercise torpedo firings will typically be north of Maui to avoid areas of high densities of humpback whales. This is the only location where the Navy can conduct very shallow water firings. These non-explosive torpedoes are recoverable. At the southeast slope beyond Penguin Bank the population area does overlap with a very small portion of W-191, which is used for surface-to-surface Gunnery Exercise that may expend explosive munitions.

Under the current HSTT settlement agreement, mid-frequency active acoustic sonar is not used during major training events in Areas 2-A through 2-C, and Navy agreed to limit the use of mid-frequency active sonar for training and testing activities during major training events to one Rim of the Pacific in 2016, one Rim of the Pacific in 2018; and three Undersea Warfare Exercises per calendar year.

While Kaiwi Channel between Molokai and Oahu is not routinely used for training that involves strait transits to protect high-value units, this channel provides for opportunistic training within a channel environment for Navy ships based in Pearl Harbor. This is an area where opportunistic mid-frequency active sonar and anti-submarine warfare training occurs when ships are present in this area. Training

and testing activities using in-water explosives are not conducted in Kaiwi Channel, as this area is not within Special Use Airspace. Overall, this area is characterized as an area of "low use" for mid-frequency active sonar.

The 4-Islands Region common bottlenose dolphin small and resident population area also covers the shallow portions of the Alenuihaha Channel along the southeast coast of Maui. The Alenuihaha Channel offers a unique training capability that does not exist elsewhere in the Hawaii Range Complex and is an ideal location for strait transits using mid-frequency active sonar and combined Carrier Strike Group Operations. However, the narrow coastal waters of the 4-Islands Region population area do not extend far into the channel and are unlikely to be used during those operations. Operations conducted in the Alenuihaha channels and potential geographic mitigation in that area are addressed in the Hawaii Island biologically important area discussion (see K.3.7.6).

K.3.7.4.2 4-Islands Region Common Bottlenose Dolphin Small and Resident Population Area Mitigation Considerations

Training effectiveness of the Submarine Command Course certification training could be compromised if units were forced to adhere to year-round restrictions and prohibitions against using any mid-frequency active sonar in the 4-Islands Region or if units were instead required to operate strictly on the Pacific Missile Range Facility ranges. The training value within the 4-Islands Region is much higher due to the challenging bathymetry. Such a shift in location would result in a loss of shallow water operating experience for prospective Submarine Commanding Officers, which is an absolutely vital skill for these commanders to master when the course convenes in the Hawaii Range Complex.

Some unit level anti-submarine warfare training within the 4-Islands Region, because of its unique shallow water environment, would be difficult to replicate elsewhere within the Hawaii Range Complex. Such a shift in location would result in a loss of shallow water operating experience and would compromise a submarine crew's ability to retain and improve their capabilities and to train with new emerging technologies. Additionally, shifting all Submarine Command Course certification and unit-level anti-submarine warfare training to the ranges offshore of the Pacific Missile Range Facility or to other areas could put additional pressure on other small and resident populations.

Training and testing using in-water explosives are not typically conducted within the 4-Islands Region as these areas are not a designated underwater training range or within Special Use Airspace. There is a very small overlap with W-191, but the area of overlap is so small that the probability of explosives use off the edge of Penguin Bank in the population area is very low. Current mitigation measures also require observation before and during activities that involve explosives, and require operators to cease fire or cease detonations if marine mammals are sighted in the mitigation zones (see Chapter 5, Mitigation, for details). All other training and testing in the 4-Islands Region is conducted using non-explosive munitions.

Animals within the 4-Islands Region Common Bottlenose Dolphin Small and Resident Population Area could be exposed to sound from sonar or other transducers and some behavioral or temporary impacts could occur from the occasional use of mid-frequency active sonar during Submarine Command Course and unit-level training and testing. The Navy is proposing to expand the 4-Islands Region Mitigation Area (formerly known as the Humpback Whale Cautionary Area) to the north of Molokai and Maui that overlaps partially with the 4-Islands Region Common Bottlenose Dolphin Small and Resident Population Area (Figure K.3-9). The Navy would restrict the use of all surface ship hull-mounted mid-frequency active sonar during testing, unit-level training and major training exercises in the mitigation area from November 15 through April 15, and explosives in the mitigation area year-round. Implementing the

additional mitigation would provide some added protection to bottlenose dolphins in the small and resident area during that time of year. See Section K.2.2 (Mitigation Areas to be Implemented) for details on proposed mitigation areas.

K.3.7.5 Oahu Common Bottlenose Dolphin Small and Resident Population Area, Settlement Area 2-D

The Oahu Common Bottlenose Dolphin Small and Resident Population Area encompasses waters around Oahu out to 1,000 m depth, except in the Kaiwi Channel between Molokai and Oahu, where the boundary runs approximately equidistant between the 500 m isobaths around Oahu and Molokai, through the middle of Kaiwi Channel. The total size of the area is in excess of approximately 800 NM^2. This population area overlaps with a portion of settlement area 2-D and Humpback Whale Special Reporting Areas along the north and southeast coasts of Oahu in the Hawaiian Islands Humpback Whale National Marine Sanctuary.

K.3.7.5.1 Navy Requirements for Area Specific Training and Testing

This population area fully contains the Pearl Harbor Naval Defense Sea Area, Puuloa Underwater Range, Barbers Point Underwater Range, and the Ewa Training Minefield. It overlaps portions of the Fleet Operational Readiness Accuracy Check Site Range and W-189.

The Fleet Operational Readiness Accuracy Check Site Range on the west of Oahu is associated with in-situ electronic equipment that checks range and bearing accuracy for Navy ships to ensure equipment function and calibration. Systems that are checked include radars, passive sonars, and active sonars. The ship will conduct a series of "runs" on the range, each taking approximately 1.5 hours. Both active and passive sonar can be checked on a single run. During a run, the ship will approach the target, which could be a stationary underwater acoustic transducer located offshore or the shore station, making a slow turn to eventually track outbound from the target, and establishing a bearing to the target in use. This information is compared with the known bearing. During active sonar testing, range-to-target information is also evaluated.

There is relatively little tactical training sonar usage in areas overlapping the Common Bottlenose Dolphin Small and Resident Population Area around Oahu, but opportunistic unit-level training can occur when ships are in the area. Sonar may be used during events in W-189, but only a small portion of W-189 overlaps with the population area. Non-explosive gunnery and rockets and dipping sonar used during anti-submarine warfare training would likely occur further offshore in W-189, and not within the biologically important area around Oahu.

The Naval Defensive Sea Area is a restricted area at Naval Station Pearl Harbor established by an Executive Order and controlled by the Navy. The Naval Defensive Sea Area encompasses areas where underwater training for training and testing activities would occur, notably diving and salvage operations. The Naval Defensive Sea Area includes Pearl Harbor Channel, where activities include submarine navigation with sonar, sonar system maintenance and systems checks, and vessel operations. In-port activities like Civilian Port Defense – Homeland Security Anti-Terrorism/Force Protection Exercises, pier-side system checks, swimmer defense, and small boat operations occur in Pearl Harbor. Access to the area is restricted.

The Puuloa and Barbers Point Underwater Ranges and the Ewa Training Minefield are restricted areas used for mine neutralization and special warfare operations. Mine Neutralization involves the detection, identification, evaluation, rendering safe, and disposal of mines and unexploded munitions that

constitutes a threat to ships or personnel. Mine neutralization training is conducted by a variety of air, surface, and sub-surface assets. Tactics for neutralizing ground or bottom mines involve a diver placing a specific amount of explosives which, when detonated underwater at a specific distance from a mine, results in neutralization of the mine. Floating, or moored, mines involve the diver placing a specific amount of explosives directly on the mine. The Navy deploys divers in very shallow water depths (10–40 ft.) to locate mines and obstructions. Additionally, the Puuloa Underwater Range is also used for diving and salvage operations and the Ewa Training Minefield is used by surface ships for mine avoidance training.

Marine Corps Base Hawaii and Marine Corps Training Area Bellows are used for amphibious warfare expeditionary assault, swimmer insertion/extraction, and special warfare operations. Only a small, nearshore portion of W-189 overlaps with the Common Bottlenose Dolphin population area around Oahu. W-189 is used for both surface and air operations, specifically air combat maneuver, during which no live munitions are used, only chaff and flares. W-189 is routinely used by Navy MH-60 helicopters and Marine Corps rotary wing aircraft based out of Marine Corps Base Hawaii for non-explosive gunnery and rocket exercises, and used during anti-submarine warfare training during which they use dipping sonar. The limited distance from land that rotary wing aircraft can travel because of fuel limitations and safety factors dictate the use of this area versus other areas.

K.3.7.5.2 Oahu Common Bottlenose Dolphin Small and Resident Population Area Mitigation Considerations

The designated Oahu common bottlenose dolphin area includes the Naval Defensive Sea Area, the Pearl Harbor Channel and harbor itself, underwater ranges at Puuloa and Barbers Point, the Ewa Training Minefield, the amphibious warfare training beaches and waters of Marine Corps Base Hawaii and Marine Corps Training Area Bellows, and the Fleet Operational Readiness Accuracy Check Site Range off the west Oahu coast. All these areas and their use are critical to the Navy's basic operations (such as access to Pearl Harbor), critical to the requirements (such as the shallow water diver training area at Puuloa), and critical to the effectiveness of specific training requirements as detailed previously.

System checks at the Fleet Operational Readiness Accuracy Check Site Range cannot be completed anywhere else because they require infrastructure on the bottom and on the adjacent land.

Much of the sonar use in this population area is involved in system testing and navigation. Pier-side testing cannot be done outside Pearl Harbor and sonar usage when entering and exiting Pearl Harbor is necessary for safety reasons, for navigation and to ensure systems work and operators are proficient.

Activities on the Puuloa and Barbers Point Underwater Ranges and the Ewa Training Minefield occur there because access is controlled for the safety of the public, and because these areas are shallow and close to shore facilities for small boat access. Training and testing using in-water explosives within the common bottlenose small and resident population area around Oahu will only occur on designated underwater training ranges or Special Use Airspace. Flying or sailing those military units and all their equipment to the Pacific Missile Range Facility for all of their required training and testing if these ranges were unavailable would be impractical, due to increased costs, lost training/testing time, time away from homeport, all of which potentially impact readiness. The only Special Use Airspace that overlaps this population area is W-189, but most materials will be expended in deeper waters beyond the biologically important area. All training and testing outside of those areas is conducted using non-explosive munitions.

While Kaiwi Channel between Molokai and Oahu is not routinely used for training that involves strait transiting while protecting high-value units, this channel provides for opportunistic training within a channel environment for Navy ships based in Pearl Harbor. This is an area is used for opportunistic anti-submarine warfare training when ships are present in this area. Training and testing activities using in-water explosives are not conducted Kaiwi Channel, as this area is not within Special Use Airspace. Overall, this area is characterized as an area of "low use" for mid-frequency active sonar.

The identified small and resident population is located within nearshore waters where the Navy does not typically conduct more intense activities such as anti-submarine warfare training or major training events. Explosives use is restricted to designated ranges or typically conducted offshore. However, animals within the Common Bottlenose Dolphin Whale Small and Resident Population Area could be exposed to sound from sonar or other transducers and sound and energy from explosives, and some behavioral or temporary impacts could occur from the occasional use of mid-frequency active sonar and explosives during unit-level training and testing.

There are no alternative locations to Pearl Harbor, Marine Corps Base Hawaii, shallow water areas of Oahu, or other associated Oahu water space since all of the waters around Oahu are part of the designated biologically important area. When balanced with the mitigation's effectiveness and operational practicality, implementing additional mitigation for sonar or other transducers to further avoid or reduce potential impacts on common bottlenose dolphins in the small and resident population area, would compromise military readiness.

K.3.7.6 Hawaii Island Common Bottlenose Dolphin Small and Resident Population Area, Settlement Areas 1-A through 1-E, and 2-E

The Common Bottlenose Dolphin Small and Resident Population Area around Hawaii Island incorporate waters around Hawaii Island out to 1,000 m depth. This population area overlaps with portions of Settlement Areas 1-A through 1-E, and 2-E and a Humpback Whale Special Reporting Area along the northwest coast of Hawaii Island that is part of the Hawaiian Islands Humpback Whale National Marine Sanctuary.

K.3.7.6.1 Navy Requirements for Area-Specific Training and Testing

The Alenuihaha Channel, as well as the waters north and west of Hawaii Island, provides a unique training capability that does not exist elsewhere in the Hawaii Range Complex. The Alenuihaha Channel is an ideal location for strait transits using mid-frequency active sonar during training. The Alenuihaha Channel is an actual channel that provides a vital and realistic analog for similar straits or restricted maneuvering areas where the Navy operates worldwide, such as the East or South China seas. For example, transit training in the Alenuihaha Channel replicates these types of strait environments that meet the Navy's requirement to deploy Naval forces to ensure the free flow of commerce and the freedom of navigation by combatting piracy or mine threats. Naval forces are required to train to counter a submarine threat before deployment – to ensure such forces obtain the required proficiency to conduct anti-submarine warfare in a controlled and observed environment prior to deployment to international straits across the globe, where operational Commanders require Naval forces to be able to conduct a range of military operations, including anti-submarine warfare. This required proficiency cannot be replicated by simulation and is most effectively obtained when conducted in a strait. Commanding Officers cannot be expected to effectively conduct such operations in a deployed environment if the first time they encounter a submarine in a strait is in a deployed setting. There are few geographic areas that enable forces to do this type of training outside of the HSTT Study Area.

The ability of an aircraft carrier to defend itself from submarine attack with all available assets while conducting straits transits is critical to its survival in forward operating areas. Real –world adversaries would be expected to target our high value units in choke points like straits, where maneuvering is restricted and vessels are vulnerable to attack from land. The channel is located outside most of the civilian air traffic corridors approaching the Honolulu International Airport which is necessary to safely de-conflict with civilian air traffic.

While there are other channels within the Hawaii Range Complex used for strait transit training and anti-submarine warfare training, none provide the important attributes of the Alenuihaha Channel. The Alenuihaha Channel's proximity to the Pohakuloa Training Area allows for realistic training and reduces time and fuel costs between these training areas. The channel between Niihau and Kauai is also acceptable from a training perspective, but this would add at least two days of transit during each Under Sea Warfare training exercise (time required to move through a different channel and reposition to operating areas near Pohakuloa Training Area). The Kaiwi Channel between Oahu and Molokai is also acceptable from some mid-frequency active sonar training perspective, but it is also a significant civilian air corridor, and raises safety concerns for anti-submarine warfare aircraft flying in that channel. In addition, the channel between Nihau and Kauai is proximate to the Pacific Missile Range Facility instrumented range) which would result in problems de-conflicting multiple activities and hazardous operations, raising safety concerns. For these reasons, Alenuihaha Channel is still the most suitable for anti-submarine warfare training during certain training scenarios. The Hawaii Island Common Bottlenose Dolphin Small and Resident Population Area is adjacent to waters approaching Kawaihae Harbor, the point of amphibious insertion for forces proceeding to the range at Pohakuloa Training Area, which is the only range in the Hawaii Range Complex that supports ground force and aviation live-fire training. Training in this area allows for the integration of carrier strike group operations and amphibious landings, working in conjunction within a controlled airspace west of Hawaii Island for military training near the Pohakuloa Training Area range. Carrier strike group training can include a full spectrum of the force ¬ various ships, submarines, aircraft, and Marine Corps forces – to train in the complex command, control operational coordination, and logistics functions designed to prepare forces for deployment. As an air to ground range, Pohakuloa Training Area supports carrier strike group activities near a channel and near large open water areas for strike group maneuvering and submarine activities. Mid-frequency active sonar conducted to support strike maneuver and protect high value units (e.g., carrier) as aircraft go to strike at Pohakuloa Training Area is vital.

Access to both the Alenuihaha Channel and the waters west of Kawaihae Harbor is vital for a broad spectrum of naval and amphibious training. These areas provide a unique and irreplaceable capability within the Hawaii Range Complex that allows naval forces to conduct realistic, integrated training in an environment that replicates the actual areas where they will be called to serve.

Other waters in the small and resident population area on the west coast of Hawaii are occasionally used for unit level training. Navy does not generally train or test in the nearshore waters on the north, east, or south coasts of Hawaii island in the remainder of the designated area.

Training and testing using in-water explosives are not typically conducted within the boundaries of the Hawaii Island Common Bottlenose Dolphin Biologically Important Area as this area is not a designated underwater training range nor is it within Special Use Airspace.

K.3.7.6.2 Hawaii Island Common Bottlenose Dolphin Small and Resident Population Area Mitigation Considerations

As noted above, the Alenuihaha Channel and the waters west of Kawaihae Harbor are used for a broad spectrum of naval and amphibious training. Limiting or restricting mid-frequency active sonar training in the Alenuihaha Channel would force the separation or relocation of portions of Undersea Warfare training, Independent Deployer Certification training, Rim of the Pacific, and unit level training exercises to other channels in the Hawaiian OPAREAs further from the Pohakuloa Training Area. Undersea Warfare certification training occurs up to three times per year; Rim of the Pacific occurs once every two years; Independent Deployer Certification training occurs once per year. Segmenting these training events over time and space could result in an unacceptable loss of realism, could result in increased safety risks, and erode readiness.

Since 2009, the Navy has provided NMFS with annual sonar reporting which indicates this area has been identified by the Navy as an area of low use of mid-frequency sonar year-round with the exception of during the occasional use of this area for Undersea Warfare training, Independent Deployer Certification training, and Rim of the Pacific training. Animals within the Hawaii Island Common Bottlenose Dolphin Small and Resident Population Area could be exposed to sound from sonar or other transducers and some behavioral or temporary impacts could occur from the occasional use of mid-frequency active sonar during those events. Impacts from explosives are not anticipated in this area.

The Navy balanced the need for the use of the area to meet training and testing requirements with the biological importance of the area for false common bottlenose dolphin and other species. Establishing a mitigation area would likely reduce the number and level of impacts to this species and other species or stock, including humpback whales, Cuvier and Blainville's beaked whales, pygmy killer whales, dwarf sperm whales, melon-headed whales, short-finned pilot whales and other dolphin species occurring within the area without compromising military readiness. See Section K.2.2 (Mitigation Areas to be Implemented) for details on the proposed mitigation area.

K.3.7.7 Common Bottlenose Dolphins Small and Resident Population Areas Mitigation Assessment

As discussed in Section 3.7.3.1.2 (Impacts from Sonar and Other Transducers), common bottlenose dolphins may be exposed to sound from sonar and other transducers used during training and testing activities in the Study Area, which can occur throughout the year. The majority of exposures resulted in behavioral responses or TTS, with the majority of those exposures occurring in the Southern California portion of the HSTT Study Area. Animals within the Common Bottlenose Dolphin Small and Resident Population Areas could be exposed to sound from sonar or other transducers and some behavioral or temporary impacts could occur from the occasional use of mid-frequency active sonar. A single PTS was modeled due to exposures during training activities in the Oahu area. The results of behavioral response studies in Hawaii suggest that common bottlenose dolphins do not have an observable behavioral response to mid-frequency active acoustic sonar (Baird et al., 2014a; Baird et al., 2015b).

Animals within the Common Bottlenose Dolphin Small and Resident Population Areas could be exposed to sound and energy from explosives and some behavioral or temporary impacts could occur from the occasional use of explosives. Navy quantitative analysis estimates some injury to common bottlenose dolphins during training and none from testing in the Oahu area.

The identified small and resident population areas are mostly located within shallow, nearshore waters where the Navy does not typically conduct activities that involve explosives with the exception of the

established ranges proximate to Pearl Harbor. However, sound from explosives could still expose animals within the identified bottlenose dolphin small and resident population areas to explosive stressors and some impacts on behavior could occur. It is unlikely the same animal would receive more than a few impacts per year due to exposure to sound and energy from explosives. Bottlenose dolphin reactions to impulsive sounds are most likely short-term and mild to moderate, especially when sound sources are located more than a few kilometers away or when the animals are engaged in important biological behaviors. A single PTS and a few injuries were estimate from the acoustic model for this species, specifically for the population around Oahu. The potential for biological removal for that stock is 4.9, however, impacts at the population level are not anticipated.

As described in Section 3.7.3.1.2.1 (Methods for Analyzing Impacts from Sonar and Other Transducers), the Navy's modeling results do not take into account mitigation and may therefore overestimate potential impacts. The animats do not represent actual animals, but rather allow for a statistical analysis of the number of instances that marine mammals may be exposed to sound levels resulting in an effect. Therefore, the model estimates the number of instances in which an effect threshold was exceeded over the course of a year, but does not estimate the number of individual marine mammals that may be impacted over a year. Navy training and testing activities were associated with mortality takes of dolphins in 2011 in San Diego, but that event occurred when animals swam into a previously cleared area where a time-delay fused explosive had been placed. Mitigation measures in place now were improved to preclude a similar event and include four Lookouts and two small boats to monitor for marine mammals during the event; see Chapter 5 (Mitigation) for more details.

The Navy balanced the need for the use of the area to meet training and testing requirements with the biological importance of the area for common bottlenose dolphin and other species. While geographic mitigation would not be practicable to implement across the vast identified biologically important areas for bottlenose dolphin, given that the population areas encompass all shallow waters around all of the main Hawaiian Islands, the Navy proposes to implement mitigation areas that overlap some portions of the Common Bottlenose Dolphins Small and Resident Population Areas in the 4-Islands Region and the nearshore areas around Hawaii Island. While these mitigation areas are designed to provide additional protection for humpback whales, false killer whales and Cuvier and Blainville's beaked whales, these measures will also reduce the number and level of impacts to other species or stocks occurring within the area, including bottlenose dolphin, pygmy killer whales, dwarf sperm whales, melon-headed whales, short-finned pilot whales and other dolphin species occurring within these areas without compromising military readiness:

1. Hawaii Island Mitigation Area – limits the amount of surface ship hull-mounted, mid-frequency active sonar (MF1) and dipping sonar (MF4) and restricts the use of explosives during testing, unit level training and major training exercises year-round (Figure K.2-2); and
2. 4-Islands Region Mitigation Area – restricts surface ship hull-mounted mid-frequency active sonar (MF1) during training and testing in the mitigation area from November 15 through April 15. In addition, the Navy will restrict the use of explosives during training and testing in the 4-Island Regions Mitigation Area, year-round (Figure K.2-3).

See Section K.2.2 (Mitigation Areas to be Implemented) for more details on the above mitigation areas.

As discussed in Section K.3.7.6.1 (Navy Requirements for Area-Specific Training and Testing), due to the strategic importance of the Alenuihaha Channel, the Navy cannot completely prohibit the use of surface ship hull-mounted mid-frequency active sonar or dipping sonar during training and testing; however, the

Navy proposes to limit the amount of surface ship hull-mounted mid-frequency active sonar and dipping sonar used in the channel. The limited use of these sonar systems still allows naval forces to train in an environment that replicates strategic straits to which they will operate while likely reducing the number and level of impacts to bottlenose dolphins as well as for other marine mammal species or stocks occurring within the area without compromising military readiness.

Navy vessels operate differently from commercial vessels in ways that are important to prevent whale collisions. As described in Section 2.3.3 (Standard Operating Procedures), surface ships operated by or for the Navy have personnel assigned to stand watch at all times, day and night, when a ship or surfaced submarine is moving through the water. Available literature suggests that based on their smaller body size, maneuverability, larger group sizes, and hearing capabilities, most odontocetes would be less likely to be struck by a Navy vessel than mysticetes. Generally, odontocetes (including common bottlenose dolphins) are more capable of physically avoiding a vessel strike and since some species occur in large groups, they are more easily seen when they are closer to the water surface.

The Navy's standard operating procedures discussed in Section 2.3.3 (Standard Operating Procedures) and ongoing mitigation measures described in Chapter 5 (Mitigation) are designed to avoid or reduce impacts to marine species and stocks throughout the Study Area. These measures would also limit the interaction between Navy vessels and odontocetes, further reducing the potential for vessel strikes in and outside of identified biologically important areas.

K.3.8 Pantropical Spotted Dolphins Small and Resident Population Areas

Three areas with small and resident populations of pantropical spotted dolphins (*Stenella attenuata*) off the coasts of the main Hawaiian Islands have been recognized by NMFS as year-round biologically important areas within the HSTT Study Area (Figure K.3-15). These areas encompass waters off Oahu, the 4-Islands Region (Molokai, Lanai, Maui, Kahoolawe), and Hawaii Island (Baird et al., 2015a) and cover approximately 7,250 km^2 of water space. Visual sightings and genetic analyses suggest the presence of three demographically isolated populations. The boundaries of these populations are not known due to survey effort focused on the leeward side of the islands and lack of satellite-tag data. As shown in Table K.1-1, and described in Section K.1.1.2 (Provisional 2015 Prohibited or Restricted Areas within HSTT Study Area), the small and resident population areas overlap in part with HSTT Settlement Areas 1-C through 1-E and 2-E, and 2 -B.

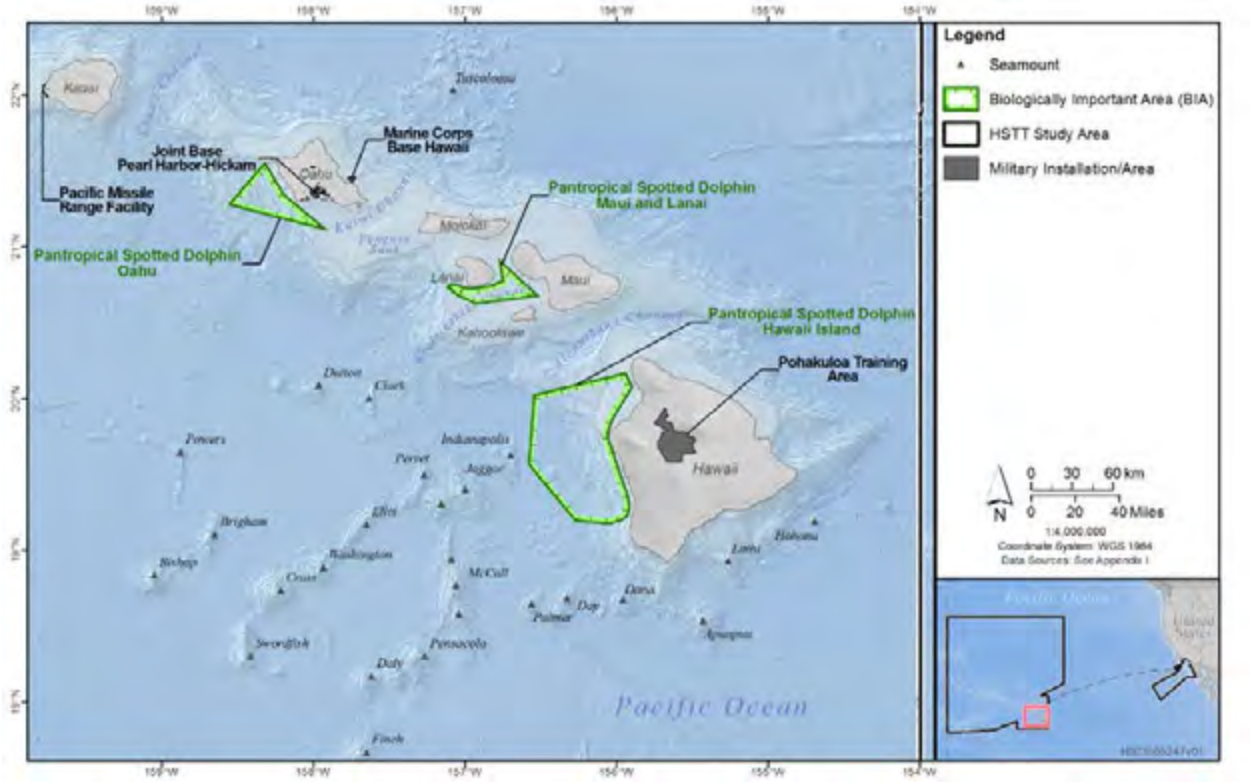


Figure K.3-15: Pantropical Spotted Dolphin Small and Resident Population Area

K.3.8.1 General Biological Assessment

For a thorough description of the pantropical dolphin species, see Section 3.7.2.3.15 (Pantropical Spotted Dolphin [Stenella attenuata]).

K.3.8.1.1 Biological Considerations Applicable to all Pantropical Spotted Dolphin Small and Resident Population Areas

Surveys have indicated that pantropical spotted dolphins appear to be clustered near the main Hawaiian Islands (Barlow, 2006; Bradford et al., 2017; Forney et al., 2015). Pantropical spotted dolphins show a preference for the leeward side of the islands during the summer and the winter, with a considerably restricted distribution in the winter (Pittman et al., 2016). Pantropical spotted dolphins have been frequently observed leaping out of the water, likely increasing sighting distances for the species (Baird, 2013). In Hawaiian waters, spotted dolphins have been observed in associations mixed in with larger numbers of spinner dolphins (Baird, 2013; Psarakos et al., 2003). Both of these characteristics result in the increased likelihood that pantropical spotted dolphins would be detected by Navy personnel engaged in training and testing activities at sea and applicable procedural mitigation measures being implemented.

In Hawaiian waters, pantropical spotted dolphins have been divided into four stocks based on photo identification data, genetic data, and the distribution of sightings in pelagic waters around Hawaii (Courbis et al., 2014; Oleson et al., 2013). The four management stocks are (1) the Oahu stock, which includes spotted dolphins within 20 km of Oahu; (2) the 4-Islands Region stock, which includes spotted dolphins within 20 km of the island group formed by Maui, Molokai, Lanai, and Kahoolawe and their adjacent waters; (3) the Hawaii Island stock, which includes spotted dolphins found within 65 km from

Hawaii Island; and (4) the Hawaii Pelagic stock, which includes spotted dolphins inhabiting the waters throughout the Hawaiian Islands Exclusive Economic Zone, outside of the insular stock areas (Carretta et al., 2017). As a result of the photo identification data, genetic data, and the distribution of sightings, some of the areas where the three demographically isolated insular stocks populations are found have been recognized as small and resident population areas for those populations (Baird et al., 2015a). In the Hawaiian Islands, pantropical spotted dolphins are often found in relatively small groups compared to pelagic populations than can be found in pods that reach 1,000. Surveys in the Hawaiian Islands in 2002 encountered pantropical spotted dolphins having a mean group size of 60 (Barlow, 2006) and in 2017 a mean group size of 43 (Bradford et al., 2017). Small boat surveys off Kauai and Niihau in 2011 and 2012 encountered groups ranging in size from 1 to 25 and off Oahu group sizes ranged from 11 to 170 (Baird et al., 2013c). During research off the west side of Hawaii Island, Silva et al. (2016) reported encountering one group with an estimated 400 spotted dolphins and on a subsequent day a group estimated to consist of 140 individuals.

During research off the west side of Hawaii Island, Silva et al. (2016) reported encountering one group with an estimated 400 pantropical spotted dolphins and on a subsequent day a group estimated to consist of 140 individuals. Based on genetic evidence, the effective population size of the island of Hawaii stock (population) was estimated to be 220 individuals (Courbis et al., 2014). Given the small sample sizes, limited surveys, and the fact that at least one group approximately twice as large as the estimated total population size (n=220) has been observed in the Hawaii Island small and resident population area (Silva et al., 2016), there is likely considerable unrecognized range overlap between the insular stock and the Hawaii pelagic stock, despite the pelagic stock being defined as those spotted dolphins found outside of the insular stock areas (Carretta et al., 2017). Sample sizes were not sufficient to estimate the population sizes for the Oahu or the 4-Islands Region population (Courbis et al., 2014).

K.3.8.1.2 Stressor Analysis

K.3.8.1.2.1 Sonar and Other Transducers

As detailed in Section 3.7.3.1.2 (Impacts from Sonar and Other Transducers), pantropical spotted dolphins in Hawaii may be exposed to sound from sonar and other transducers used during training and testing activities throughout the year. Analysis for the entire Hawaii population estimates that all exposures result in behavioral reactions or TTS and zero exposures at levels of PTS are anticipated.

This identified small and resident population areas are mostly located within nearshore waters where the Navy does not typically conduct activities that involve sonar or other transducers, especially more intense activities such as anti-submarine warfare training or major training events. While impacts on pantropical spotted dolphin natural behaviors due to training and testing with sonar and other transducers may occur within the small and resident population area, they are unlikely to rise to the level of significant under NEPA nor would they be sustained for a duration long enough that it caused an animal to be outside of normal daily variations in feeding, reproduction, resting, migration/movement, or social cohesion. Any TTS in the biologically important areas would be minor to moderate, from which the individual dolphin would fully recover quickly.

K.3.8.1.2.2 Explosives

As discussed in Section 3.7.3.2.2 (Impacts from Explosives) for pantropical spotted dolphins, Navy training and testing activities that use explosives could occur year-round within the Hawaii Range Complex. However, the identified small and resident population areas are mostly located within nearshore waters and do not overlap with areas where the Navy conducts activities that involve

underwater explosives, e.g., Puuloa Underwater Training Range or Special Use Airspace where bombing or torpedo exercises (e.g., KAPU HOT) would occur. Sound from explosives outside of the biologically important area could still expose animals within the small and resident population areas to acoustic stressors, though pantropical spotted dolphin reactions to explosives are most likely short term and mild to moderate, especially when sound sources are located more than a few kilometers away or when the animals are engaged in important biological behaviors. While impacts on pantropical spotted dolphins' natural behaviors due to training and testing with explosives may occur within the small and resident population area, they unlikely to rise to the level of significant under NEPA nor would they be sustained for a duration long enough that it caused an animal to be outside of normal daily variations in feeding, reproduction, resting, migration/movement, or social cohesion. Any TTS in the biologically important areas would be minor to moderate, from which the individual dolphin would fully recover quickly. No PTS or injury was estimated for this species from exposure to explosives.

K.3.8.1.2.3 Vessel Strike

In small boat surveys in Hawaii, pantropical spotted dolphins showed no obvious avoidance of the research vessel (Baird, 2013). As discussed in Section 3.7.3.4.1 (Impacts from Vessels and In-Water Devices), in general, odontocetes move quickly and seem to be less vulnerable to vessel strikes than other cetaceans; however, most small whale and dolphin species have at least occasionally suffered from strikes attributed to small boats and craft such as jet skis. Generally, odontocetes are more capable of physically avoiding a vessel strike and since some species occur in large groups, they are more easily seen when they are closer to the water surface.

Navy vessels operate differently from commercial vessels in ways that are important to prevent collisions with marine mammals. As described in Section 2.3.3 (Standard Operating Procedures), surface ships operated by or for the Navy, have personnel assigned to stand watch at all times, day and night, when a ship or surfaced submarine is moving through the water (underway). Available literature suggests that based on their smaller body size, maneuverability, larger group sizes, and hearing capabilities, most odontocetes would be less likely to be struck by a Navy vessel than mysticetes.

K.3.8.2 Oahu Pantropical Spotted Dolphins Small and Resident Population Area

The Pantropical Spotted Dolphins Small and Resident Population Area is shown on Figure K.3-15 and encompasses 1,050 km^2. This area is located along the southwest coast of Oahu, between 21° N and 22° N latitude and 157° W and 159° W longitude (Baird et al., 2015a). The water depth of the area ranges from 300 m to 2,960 m. The Oahu Pantropical Spotted Dolphin Small and Resident Population Area does not overlap any settlement areas.

K.3.8.2.1 Navy Requirements for Area-Specific Training and Testing

The Oahu Pantropical Spotted Dolphin Small and Resident Population Area overlaps with the Shipboard Electronic Systems Evaluation Facility and a small portion of the Fleet Operational Readiness Accuracy Check Site Range. It does not overlap with any special use airspace.

The Fleet Operational Readiness Accuracy Check Site Range on the west of Oahu is associated with in-situ electronic equipment that checks range and bearing accuracy for Navy ships to ensure equipment function and calibration. Systems that are checked include radars, passive sonars, and active sonars. The ship will conduct a series of "runs" on the range, each taking approximately 1.5 hours. Both active and passive sonar can be checked on a single run. During a run, the ship will approach the target, which could be a stationary underwater acoustic transducer located offshore or the shore station, making a

slow turn to eventually track outbound from the target, and establishing a bearing to the target in use. This information is compared with the known bearing. During active sonar testing, range-to-target information is also evaluated.

The Pantropical Spotted Dolphin Small and Resident Population Area also overlaps with the Surface Ship Radiated Noise Measurement System west of the entrance to Pearl Harbor, which evaluates the waterborne acoustic characteristics of Navy ships, and provides information to determine corrective actions to reduce a ship's acoustic noise, thus reducing vulnerability to undersea warfare threats.

Sonar may be used as ships and submarines enter and exit Pearl Harbor. The Pantropical Spotted Dolphin Small and Resident Population area is relatively far from the Pearl Harbor Channel, but opportunistic unit-level training and testing using sonar can occur when ships are in the area or transiting through it to and from Pearl Harbor.

The Shipboard Electronic Systems Evaluation Facility provides state-of-the-art test and evaluation of combat systems that radiate or receive electromagnetic energy. The range includes land based test facilities that provide electromagnetic system test and evaluation services to afloat and shore commands. The facility's services can be used for the development of new or upgraded systems, and provide a real-time evaluation of a system in an operational environment. Tests are conducted to evaluate ship, shore, and aircraft systems that emit or detect electronic emissions. These systems include those used for radio communications, data transfer, navigation, radar, and systems that identify friend and foe. Either the platform being tested, the Shipboard Electronic Systems Evaluation Facility, or both will transmit specific electronic signals. The test equipment operated by the facility allows for a performance evaluation of the ship, shore, or aircraft system. Tests conducted by the facility fall into one of two broad categories: Quick Look and System Performance tests. Neither test uses munitions or sonar.

Quick Look tests are generally conducted during transit to and from port, or while pier side at Pearl Harbor. These tests provide a quick operational evaluation of the system(s) on the ship that are being tested and result in a simple "satisfactory" or "unsatisfactory" grade. System performance tests provide a more detailed analysis and evaluation of the system(s) being testing, and generally require longer periods of dedicated testing and require the ship to maneuver in pre-defined geometries within a certain geographic area.

K.3.8.2.2 Oahu Pantropical Spotted Dolphins Small and Resident Population Area Mitigation Considerations

As discussed above, the designated pantropical spotted dolphin area off the west coast of Oahu overlaps the Fleet Operational Readiness Accuracy Check Site Range and the Shipboard Electronic Systems Evaluation Facility. System checks at the Fleet Operational Readiness Accuracy Check Site Range cannot be completed elsewhere because they require infrastructure on the seafloor and on the adjacent land. While some Shipboard Electronic Systems Evaluation Facility associated testing can be completed while in port, more detailed analyses require specific maneuvering on the range. If these system checks could not be conducted Navy combat, communications, and navigational systems could go out of calibration without the operators' knowledge. That could make Navy platforms unable to accurately resolve their targets, unable to correctly position themselves and increases the risk of collisions and grounding, or could make Navy ships more vulnerable to electronic warfare. Additionally, the portion of the area to the south is adjacent to the Barbers Point Underwater Range, the Ewa Training Minefield, the Puuloa Underwater Training Range, and the southwestern approach to Pearl Harbor and the Navy Defense Sea

Area. All these areas and their use are critical to the Navy's basic operations (such as access to Pearl Harbor), critical to the requirements (such as the infrastructure at Fleet Operational Readiness Accuracy Check Site Range and Surface Ship Radiated Noise Measurement System), and critical to the effectiveness of specific training requirements as detailed previously. There is no alternative to the use of Pearl Harbor and it is most effective and efficient to use the adjacent training locations offshore. Any other training and testing in the small and resident population area is likely to be opportunistic during transit.

Activities utilizing in-water explosives, such as underwater detonations, bombing or torpedo exercises, are not conducted in the waters within the Pantropical Spotted Dolphin Small and Resident Population Area since it is not a designated underwater training range nor within Special Use Airspace, typically necessary for in-water explosive usage.

K.3.8.3 4-Islands Region Pantropical Spotted Dolphins Small and Resident Population Area, Settlement Area 2-B

The 4-Islands Region Pantropical Spotted Dolphin Small and Resident Population Area (area around south coast of Lanai, including Auau Channel between Lanai and Maui, and northern portions of Kealaikahiki Channel between Lanai and Kahoolawe) overlaps with Settlement Area 2-B as described in Section K.1.1.2 (Provisional 2015 Prohibited or Restricted Areas within HSTT Study Area). It overlaps with a portion of the Hawaiian Islands Humpback Whale National Marine Sanctuary, the Humpback Whale Cautionary Area, and a Humpback Whale Special Reporting Area. It does not overlap with any special use airspace.

K.3.8.3.1 Navy Requirements for Area-Specific Training and Testing

The 4-Islands Region provides a for anti-submarine warfare search, tracking and avoidance of opposing anti-submarine warfare forces. The bathymetry provides unique attributes and unmatched opportunity to train in searching for submarines in shallow water. Littoral training allows units to continue to deploy improved sensors or tactics in littoral waters. In the Hawaii portion of the HSTT Study Area specifically, anti-submarine warfare training in shallow water is vitally important to the Navy since diesel submarines typically hide in that extremely noisy and complex marine environment (Arabian Gulf, Strait of Malacca, Sea of Japan, and the Yellow Sea all contain water less than 200 m deep). There is no other area in this portion of the HSTT Study Area with the bathymetry and sound propagation analog to seas where Navy conducts real operations that this training could relocate to. The Navy cannot conduct realistic shallow water training exercises without training in and around the 4-Islands Region. In addition, this area includes unique shallow water training opportunities for unit-level training, including opportunity to practice operations in littoral areas that are both shallow, and navigationally constrained, and in close proximity to deeper open ocean environments.

Submarine Command Course training is conducted twice a year in Hawaii, in February and August, (with the intermittent use of active sonar over a three-to-five day period per event). Submarine Command Course training is a Medium Coordinated Anti-Submarine Warfare Training exercise (see Table 2.3-2). The 4-Islands Region is used for Submarine Command Course training as a location to train prospective Submarine Commanding Officers to operate in shallow water. The Pailolo and Kalohi Channels are used to simulate strait transits and provide valuable experience that the prospective Commanding Officers would experience while deployed. The Pailolo and Kalohi Channels are used to simulate strait transits and provide realistic shallow water environments for qualification of prospective Commanding Officers. For example, conducting shallow water anti-submarine warfare training in a deep water environment

while simulating fathometer readings would develop bad habit patterns of ignoring the critical depth aspect of the training, and in a real world situation, those readings may possibly be ignored as well, and thereby jeopardizing safety and survival of the ship and crew. Training in actual shallow water conditions is mandatory to develop proper crew coordination and tactics, techniques and procedures to ensure mission success. Additionally, training in the shallow water environment is essential for crews to experience the effect of bottom topography, (upslope and downslope) on sonar transmission and returns for detecting threat targets in different advantageous positions.

While submarines do not typically use mid-frequency active sonar, relying primarily on passive sonar (listening mode) to avoid detection from adversaries, submarines are required to train in counter detection tactics, techniques and procedures against threat surface vessels, airborne anti-submarine warfare units and other threat submarines using mid-frequency active sonar as part of both their perspective commanding officer's qualification course and pre-deployment certification. The ability for surface vessels and air assets to simulate opposing forces, using use mid-frequency active sonar when training with submarines, is critical to submarine crew training for deployed and wartime operations. Surface warfare training is designed to support unit-level training requirements and group cross-platform events in 28 mission areas for surface ship certification prior to deployment. The Required Operational Capabilities and Required Operational Environment guidance outlines anti-submarine warfare areas specifically requiring crews to accomplish 58 major tasks to support both deep and shallow water anti-submarine training activities, across multiple domains of the open ocean and littoral areas, while conducting unit and group self-defense training across multiple platforms and defensive operations.

Surface vessels and air assets work with submarines in that area while conducting submarine Commanding Officer's training scenarios that include extended shallow water operations at periscope depth, general surveillance missions in shallow water, shallow water weapons employment, close to shore navigation, shallow water minefield operations, and shallow water ship control. Such training evolutions are necessary for the Commanding Officer to learn the skills necessary, while protecting the vessel, to ensure the crews are capable of executing their mission.

Additionally, the 4-Islands Region possesses other attributes which make it an important area for anti-submarine and mine warfare training and testing:

- The Hull Integrity Testing Site is used infrequently throughout the year for post major maintenance controlled dives to test depth. This deep water range located off the northwest coast of Kahoolawe is unique and provides the necessary bathymetry to support maintenance testing and certification. A surface ship is required to escort the submarine for this type of testing.
- Kahoolawe Minefield is utilized by submarine crews and during Submarine Commander's Course certification training for mine counter measure training and certification. Mine counter measure training is typically less than one day and does not involve the use of mid-frequency active sonar by the submarine. The mine warfare range contains multiple bottom and tethered mine shapes in shallow water. Instrumentation provides submerged submarine positioning with Submerged Acoustic Navigation System buoys.
- Hawaii Area Tracking System, a non-instrumented range, is used by submarine crews and during Submarine Command Course certification training for anti-submarine warfare missions involving the employment of advance capability torpedoes (exercise torpedoes) in a challenging shallow

water and bottom type environment. These torpedoes are non-explosive and are recovered. The areas of deep water in the Hawaii Area Tracking System located off the northwest coast of Kahoolawe provide challenging bathymetry to support submarine post-major maintenance testing and certification. The Hawaii Area Tracking System is also used by submarine crews during Submarine Commander's Course certification training on anti-submarine warfare and surface warfare missions.

- Expeditionary warfare training is conducted on the west coast of Maui—no explosives are used—which includes swimmers getting to a beach with small boats where access is limited.
- Littoral Combat Ship training and certification of the anti-submarine and mine warfare mission modules may require use of the Kahoolawe minefield and shallow water in this area.
- Unit level anti-submarine warfare training during the basic phase is conducted within this area.

This area provides a unique and highly important shallow water training environment in which units can practice operations in littoral areas that are both shallow and navigationally constrained. This network of shallow water inter-island channels is unique within the Eastern and Mid Pacific training range complexes. The area provides an unmatched opportunity for submarines to train in shallow water without the need to use active sonar during their searches. Training in these littoral areas will allow fleet units to continue to deploy improved sensors and tactics in littoral waters into the future. In general, for the Hawaii Range Complex, pushing anti-submarine warfare training further from land and out of the littorals would add transit time (increased fuel and loss of training time) in addition to providing an environment less likely to be expected in operating areas during deployment.

Loss of the shallow to deep transition would eliminate up/downslope exploitation and bottom bounce investigations, for example. Water space outside of Hawaii OPAREA can be subject to seasonal extremes making large sea states, decreasing training value. Pushing training and testing further from land increases the difficulty in air control reporting and coordination required to conduct integrated readiness activities. While Kaiwi Channel between Molokai and Oahu is not routinely used for training that involves strait transiting while protecting high-value units, this channel provides for opportunistic training within a channel environment for Navy ships homeported in Pearl Harbor. The Kaiwi Channel also overlaps partially with the Aloha submarine transit lane where some opportunistic mid-frequency active sonar and anti-submarine warfare training occurs when ships and submarines are present in this area. Training and testing activities using in-water explosives are not conducted Kaiwi Channel, as this area is not within Special Use Airspace. Overall, this area is characterized as an area of "low use" for mid-frequency active sonar.

The area provides an unmatched opportunity for submarines to train in shallow water without the need to use active sonar during their searches. Training in these littoral areas will allow fleet units to continue to deploy improved sensors and tactics in littoral waters into the future. In general, for the Hawaii Range Complex, pushing anti-submarine warfare training further from land and out of the littorals would add transit time (increased fuel and loss of training time).

The current HSTT settlement agreement prohibits the use of in-water explosives within Area 2-B, which overlaps with the Pantropical Dolphin Small and Resident Population Area. While this area has not historically been used for explosives training and testing, the area is a valuable training area for shallow water non-explosive torpedo training during the Submarine Command Course. All training in the 4-Islands Region is conducted using non-explosive munitions. Non-explosive exercise torpedo firing could also be scheduled in the area between Maui, Lanai, and Kahoolawe only for summer classes (August).

For the winter class (February) exercise torpedo firings will typically be north of Maui to avoid areas of high densities of humpback whales. This is the only location where the Navy can conduct very shallow water firings. These non-explosive torpedoes are recoverable.

K.3.8.3.2 4-Islands Region Pantropical Spotted Dolphins Small and Resident Population Area, Settlement Areas 2-B Mitigation Considerations

Only some portions of the Submarine Command Course occur in waters that overlap with the Pantropical Spotted Dolphin population area. However, training effectiveness of the Submarine Command Course certification training would be compromised if units were instead forced to operate strictly on the Pacific Missile Range Facility. The training value within the 4-Islands Region is much higher due to the challenging bathymetry. Such a shift in location would result in a loss of shallow water operating experience for prospective Submarine Commanding Officers, which is an absolutely vital skill for these commanders to master when the course convenes in the Hawaii Range Complex.

Unit level submarine training within the 4-Islands Region area, because of its unique shallow water environment, would be difficult to replicate elsewhere within the Hawaii Range Complex. The biologically important area is only a subset of the 4-Islands Region, but it is centrally located in some of the most operationally useful portions of the larger area. Such a shift in location for all activities would result in a loss of shallow water operating experience and would compromise a submarine crew's ability to retain and improve their capabilities and to train with new emerging technologies.

The identified small and resident population area only overlaps with a very small portion of the Hawaii Range Complex. Animals within the Pantropical Spotted Dolphin Small and Resident Population Area could be exposed to sound from sonar or other transducers and some behavioral or temporary impacts could occur from the occasional use of mid-frequency active sonar during Submarine Command Course and unit-level training and testing. Training and testing using in-water explosives are not typically conducted within the 4-Islands Region as these areas are not a designated underwater training range or within Special Use Airspace. All training and testing in the 4-Islands Region is conducted using non-explosive munitions.

While significant long-term impacts on pantropical spotted dolphin from training and testing with sonar and other transducers or explosives are unlikely to occur within the small and resident population area, the Humpback Whale Cautionary Area overlaps most of the 4-Islands Region Pantropical Spotted Dolphin Small and Resident Population Area, where the use of all surface ship hull-mounted mid-frequency active sonar is restricted during testing unit-level training and major training exercises from November 15 through April 15. Implementing this geographic mitigation would provide some added protection to pantropical spotted dolphin in the small and resident area during that time of year.

K.3.8.4 Hawaii Island Pantropical Spotted Dolphins Small and Resident Population Area, Settlement Areas 1-C through 1-E and 2-E

The Pantropical Spotted Dolphin Small and Resident Population Area Hawaii Island (portion of near shore area west of Hawaii Island out to 65 km) overlaps with Settlement Areas 1-C through 1-E and 2-E. It overlaps with a small portion of a Humpback Whale Special Reporting Area in the Hawaiian Islands Humpback Whale National Marine Sanctuary, and does not overlap with any special use airspace.

K.3.8.4.1 Navy Requirements for Area-Specific Training and Testing

The Hawaii Island Pantropical Spotted Dolphin Small and Resident Population Area includes waters approaching Kawaihae Harbor, the point of amphibious insertion for forces proceeding to the range at the Pohakuloa Training Area, the only range in the Hawaii Range Complex that supports ground force and aviation live-fire training. Training in this area allows for the integration of carrier strike group operations and amphibious landings. Sea, air, and land-based units work in conjunction with one another in controlled airspace in close proximity to the Pohakuloa Training Area range, the only range of its kind in Hawaii.

The waters west of Hawaii Island and those approaching Kawaihae Harbor support a wide spectrum of naval and amphibious training. Sea space and controlled airspace near the Pohakuloa Training Area land range facilitates integrated/coordinated training for anti-submarine, amphibious, and surface warfare.

Hawaii Island is unique in that it has the only air to ground range able to support carrier strike group activities near a channel and near large open water areas for strike group maneuvering and submarine activities. Mid-frequency active sonar supports strike maneuver while protecting a high value unit (e.g., aircraft carrier) as aircraft from the strike group strike at Pohakuloa Training Area as part of vital training. The area around Hawaii Island is used by surface ships with anti-submarine warfare capability to train to clear the sea space for any submarine threat before Marines go ashore at Kawaihae Harbor at the military landing zone during amphibious movements into the Pohakuloa Training Area range.

K.3.8.4.2 Hawaii Island Pantropical Spotted Dolphin Small and Resident Population Area Mitigation Considerations

As noted above, the waters west of Kawaihae Harbor are used for a broad spectrum of naval and amphibious training. These areas provide a unique and irreplaceable capability within the Hawaii Range Complex that allows naval forces to conduct realistic, integrated training in an environment that replicates the actual areas where they will be called to serve.

Since 2009, the Navy has provided NMFS with annual sonar reporting throughout the Hawaii Range Complex. This reporting is pertinent to NMFS in order to clarify that the area is an area of low use for mid-frequency active sonar. Through this reporting requirement, this area has been identified by the Navy as an area of low use of mid-frequency sonar year-round with the exception of during the occasional use of this area for Undersea Warfare training, Independent Deployer Certification training, and Rim of the Pacific training.

The identified small and resident population area only overlaps with a very small portion of the Hawaii Range Complex and is located within nearshore waters where the Navy does not typically conduct activities that involve sonar or other transducers, especially more intense activities such as anti-submarine warfare training or major training events. However, animals within the Pantropical Spotted Dolphin Small and Resident Population Area could be exposed to sound from sonar or other transducers from several km away and some behavioral or temporary impacts could occur from the occasional use of mid-frequency active sonar during Undersea Warfare training, Independent Deployer Certification training, and Rim of the Pacific training. The Navy balanced the need for the use of the area to meet training and testing requirements with the biological importance of the area for pantropical spotted dolphins and other species. Establishing the mitigation area would likely reduce the number and level of impacts to this species and other species or stock, including humpback whales, Cuvier and Blainville's beaked whales, pygmy killer whales, dwarf sperm whales, melon-headed whales, short-finned pilot

whales and other dolphin species occurring within the area without compromising military readiness. See Section K.2.2 (Mitigation Areas to be Implemented) for details on these proposed mitigation areas:

K.3.8.5 Pantropical Spotted Dolphins Small and Resident Population Areas Mitigation Assessment

Animals within the Pantropical Spotted Dolphin Small and Resident Population Area could be exposed to sound from sonar or other transducers and some behavioral or temporary impacts could occur from the occasional use of mid-frequency active sonar. Navy quantitative modelling does not estimate any non-auditory injuries to pantropical spotted dolphins in the HSTT Study Area due to Navy training and testing. Pantropical spotted dolphins are most likely to respond to exposures to sonar and other transducers with short-term behavioral reactions or TTS from which they would fully recover quickly. Pantropical spotted dolphins currently total over 15,900 individuals in the Hawaii Pelagic stock, with an unknown number of individuals in the Oahu, the 4-Islands Region, and the Hawaii Island small and resident populations. It is unlikely the same animal would receive more than a few impacts per year due to exposure to sound from sonar used during training and testing. While impacts on pantropical spotted dolphins' natural behaviors due to training and testing with sonar and other transducers may occur within the small and resident population area, they are unlikely to rise to the level of significant under NEPA nor would they be sustained for a duration long enough that it caused an animal to be outside of normal daily variations in feeding, reproduction, resting, migration/movement, or social cohesion.

Activities utilizing in-water explosives, such as underwater detonations, bombing and torpedo exercises, are not conducted in any of the Pantropical Spotted Dolphin Small and Resident Population Areas, and therefore impacts are not expected.

However, the Navy proposes to implement two mitigation areas that overlap some portions of the Pantropical Spotted Dolphins Small and Resident Population Areas in the 4-Islands Region and the nearshore areas around Hawaii Island. While the following mitigation areas are designed to provide additional protection for humpback whales, false killer whales and beaked whale species, these measures would also reduce the number and level of impacts to other species or stocks occurring within the area, including pantropical spotted dolphin:

1. Hawaii Island Mitigation Area – limits the amount of surface ship hull-mounted, mid-frequency active sonar (MF1) and dipping sonar (MF4) and restricts the use of explosives during testing, unit level training and major training exercises year-round (Figure K.2-2); and
2. 4-Islands Region Mitigation Area – restricts surface ship hull-mounted mid-frequency active sonar (MF1) during training and testing in the mitigation area from November 15 through April 15. In addition, the Navy will restrict the use of explosives during training and testing in the 4-Island Regions Mitigation Area, year-round.

See Section K.2.2 (Mitigation Areas to be Implemented) for more details on the above mitigation areas.

Navy vessels operate differently from commercial vessels in ways that are important to prevent whale collisions. As described in Section 2.3.3 (Standard Operating Procedures), surface ships operated by or for the Navy has personnel assigned to stand watch at all times, day and night, when a ship or surfaced submarine is moving through the water. Available literature suggests that, based on their smaller body size, maneuverability, larger group sizes, and hearing capabilities, most odontocetes would be less likely to be struck by a Navy vessel than mysticetes. Generally, odontocetes (including pantropical spotted

dolphins) are more capable of physically avoiding a vessel strike and since some species occur in large groups, they are more easily seen when they are closer to the water surface.

As discussed in Section 3.0.3.3.4.1 (Vessels and In-Water Devices), large Navy ships typically operate at average speeds of between 10 and 15 knots, which for reference is slower than large commercial vessels, such as container ships that steam at approximately 24 knots during normal operations (Maloni et al., 2013). Operating vessels at speeds that are not optimal for fuel conservation or mission requirements would be unsustainable due to increased time on station and increased fuel consumption. Each ship has a limited amount of time that it can be underway based on target service requirements and ship schedules. Ship schedules are driven largely by training cycles, scheduled maintenance periods, certification schedules, and deployment requirements. Because of the complex logistical considerations involved with maintaining ship schedules, the Navy does not have the flexibility to extend the amount of time that ships are underway during training and testing, which would result from vessel speed restriction mitigation. If the Navy were to incorporate vessel speed restrictions into event planning for approximately 3–6 months out of the year, ships would be unable to meet all of their requirements during their limited time available to be underway. This would hold true even if the restrictions only applied to transits to and from training or testing event locations and not during the events themselves. Therefore, it would not be practicable for the Navy to implement speed restrictions within the biologically important areas.

As described in Section 5.3.4.1 (Vessel Movement), additional vessel speed restrictions would prevent vessel operators from gaining handling proficiency, would prevent the Navy from properly testing vessel capabilities, and would increase required the time on station during training or testing events to build skill proficiency or properly test vessel capabilities (which would significantly increase fuel consumption); therefore, the proposed mitigation would have significant impacts on the Navy's ability to train and test, and would prevent the Navy from meeting its mission requirements.

Mitigation measures described in Chapter 5 (Mitigation) are designed to avoid or reduce impacts to marine species and stocks throughout the Study Area. These measures would also limit the interaction between Navy vessels and odontocetes, further reducing the potential for vessel strikes in and outside of identified biologically important areas.

K.3.9 Spinner Dolphins Small and Resident Population Areas: Hawaiian Islands Stock Complex

Areas with a small and resident population of spinner dolphins (Stenella longirostris) in waters from Hawaii Island to Kure and Midway Atolls and Pearl and Hermes Reefs were identified as year-round biologically important areas within the HSTT Study Area in Baird et al (2015a) (Figure K.3-16 and Figure K.3-17). These resident populations reflect five of the six spinner dolphin stocks making up the Hawaiian Islands Stock Complex (Carretta et al., 2017). The Spinner Dolphin Small and Resident Population Areas have an overall area that covers approximately 38,000 km^2 and extends 10 NM off the coast of each island, atoll, or reef. The water depth of the area ranges up to approximately 4,440 m. These small and resident population areas overlap in part with HSTT Settlement Areas 2-A through 2-D, 1-A through 1-E, and 2-E. General Biological Assessment

NMFS recognizes five distinct island-associated stocks of spinner dolphins in Hawaii. They are the Midway/Kure, Pearl and Hermes Reef, Kauai and Niihau, Oahu/4-Islands Region, and Hawaii Island stocks. Spinner dolphins that occur farther than 10 NM offshore are considered to be part of a pelagic stock. None of these stocks are listed under the ESA.

K.3.9.1.1 Biological Considerations Applicable to all Spinner Dolphin Small and Resident Population Areas

For a thorough description of the spinner dolphin species, see Section 3.7.2.3.17 (Spinner Dolphin [*Stenella longirostris*]).

Spinner dolphins occur in both oceanic and coastal environments and do not show seasonal movement patterns (Jefferson et al., 2015). In the Hawaiian Islands, spinner dolphins occur along the leeward coasts of all the major islands and around several of the atolls northwest of the main Hawaiian Islands. Genetic evidence has identified five isolated populations of spinner dolphins in the Hawaiian archipelago and it is these populations that have been identified as small and resident populations, which also correspond to the stock designations (Carretta et al., 2017). The boundaries of the populations are recognized from shore out to 10 NM, as few individuals have been found to occur farther offshore, or to move significant distances from island associated habitat (Baird et al., 2015a; Carretta et al., 2011). Spinner dolphins exhibit a predictable diurnal behavioral pattern of foraging in deeper waters offshore at night, and moving to shallow (less than 50 m) protected areas (e.g., bays) during the day to rest and socialize (Tyne et al., 2014).

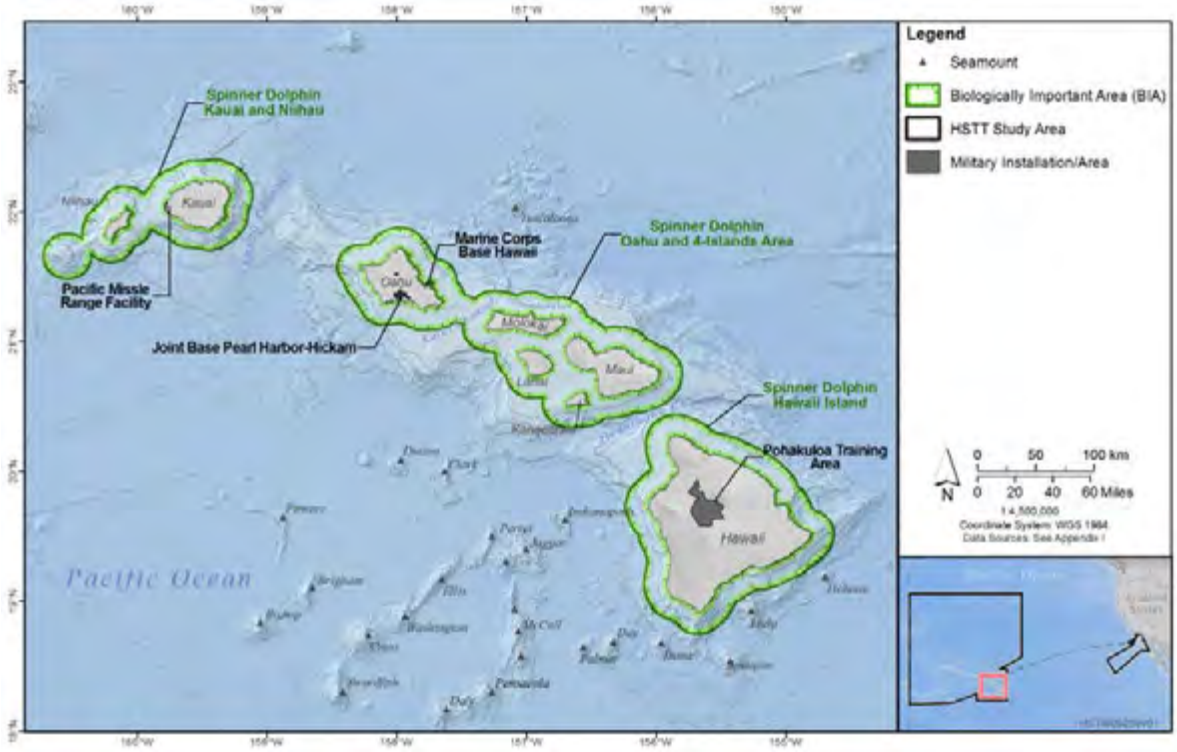


Figure K.3-16: Spinner Dolphin Small and Resident Population Area Main Hawaiian Islands

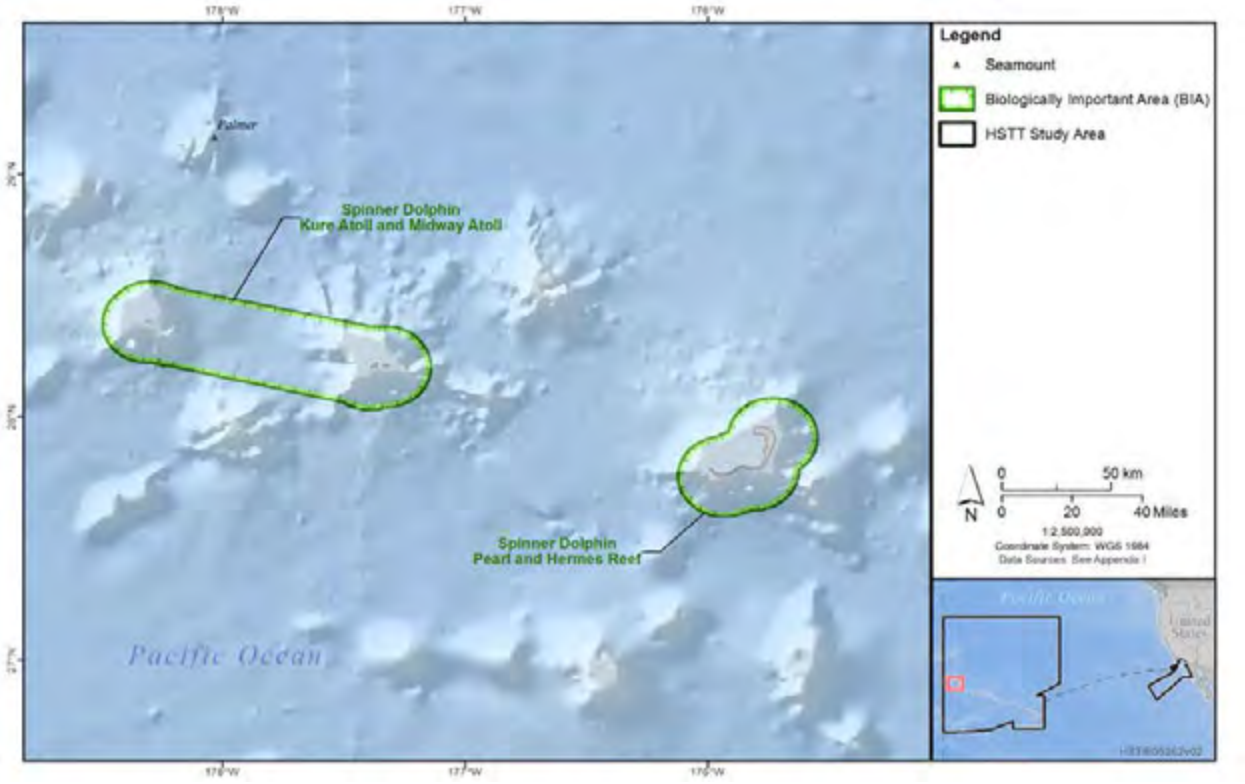


Figure K.3-17: Spinner Dolphin Small and Resident Population Area in Northwest Hawaiian Islands

The biologically important areas described for spinner dolphins are used for both daytime behaviors (rest and socialization) closer to shore and nocturnal foraging behavior offshore. Island-associated spinner dolphins have been tagged and tracked moving as far as 8 km offshore to feed (Hill et al., 2010). While genetic differences are statistically significant between island-associated populations, the Kure and Midway atolls, and Pearl and Hermes reef, genetic indicators from populations on Oahu are not significantly different from the Niihau/Kauai or the Maui/Lanai (4-Islands Region) populations. Therefore, due to geographic separation from Niihau and Kauai, the Oahu population is considered to be part of the 4-Islands Region population (Hill et al., 2010). Models by Tyne et al., (2015) found that spinner dolphins are highly unlikely to rest in areas other than protected embayments after being displaced or disturbed by anthropogenic activity (e.g., swimming, kayaking, close proximity to small boat). Daytime resting areas located close to shore are easily accessible by dolphin watching boats, resulting in an increase in vessel, kayak, and swimmer traffic inside and at the mouths of bays where resting behavior occurs. On the Island of Hawaii, these activities have resulted in spinner dolphins spending less time in essential resting habitats (Heenehan et al., 2016a; Heenehan et al., 2016b; Heenehan et al., 2017a; Heenehan et al., 2017b; Tyne et al., 2014; Tyne, 2015; Tyne et al., 2015; Tyne et al., 2017).

At night, spinner dolphins must remain vigilant for foraging and predator avoidance. As an animal remains vigilant they exhibit enhanced brain function and tire. The accrual of time staying vigilant causes vigilance decrement in higher vertebrates which results in an individual's decreased ability to detect predators or prey, and may also reduce their decision-making skills (Tyne et al., 2014). This decreased

ability to locate predators and prey as well as make decisions leads to negative impacts on individuals and, if chronic, to entire small and resident populations.

Typically, spinner dolphins return to protected bays at sunrise and socialize then rest over sandy bottom substrate between 10:00 a.m. and 2:00 p.m. before becoming more social before nightfall and their next feeding (Tyne et al., 2016). Because spinner dolphins have a predictable behavioral pattern of feeding nocturnally and returning to bays in the morning and throughout the day to rest, they may be less resilient to tourism related human disturbances than other species since this is their normal resting period (Tyne et al., 2017). Estimates of spinner dolphin populations were not reliable in 2010 for any of the spinner dolphin stocks; the collaborative project Spinner Dolphin Acoustics Population Parameters and Human Impacts Research Project was developed to assess the abundance, distribution, and behavior of spinner dolphins along the west (Kona) coast of the island of Hawaii (Tyne et al., 2015). Results of this study found that there was an abundance of between 631 and 668 spinner dolphins on the west coast of the island of Hawaii (Tyne et al., 2015). The interactions between humans and spinner dolphins has increased significantly in Hawaii over the last 30 years, and the abundance estimates from 2011 and 2012 were lower than in previous estimates. This may indicate that there has been a long-term impact on the small and resident populations from tourism and human disturbance in resting bays (Heenehan et al., 2017a; Tyne et al., 2017).

On November 16, 2016, as a result of these studies, NMFS reopened the comment period on a proposed rule in the Federal Register (81 Federal Register 80629), issued originally on August 24, 2016 (81 FR 57854) under the under MMPA, to prohibit swimming with and approaching Hawaiian spinner dolphins within 50 yards (45.7 m) for persons, vessels, and objects, including approach by interception (National Marine Fisheries Service, 2016a, 2016c). Other alternatives proposed in the ruling include time-area closures of certain preferred resting bay habitats to preclude tourism related disturbances at those locations. As of the time of this writing, the proposed rule has not been finalized.

The U.S. Navy has been funding monitoring in the main Hawaiian Islands under the Pacific Fleet Marine Species Monitoring Program since the mid-2000s. Since 2012, monitoring in the Hawaii Range Complex has occurred primarily off Kauai in order to utilize the instrumented hydrophone range at the Pacific Missile Range Facility for passive acoustic monitoring and analysis of marine mammal exposure and response to Navy training and testing. The Pacific Missile Range Facility is used for a variety of training and testing activities, including anti-submarine warfare training, which requires use of hull-mounted mid-frequency active sonar. Since 2007, several days of marine mammal acoustic data have been obtained and archived from the Pacific Missile Range Facility hydrophones each month for future analysis. Submarine Command Course occurs on the range twice a year and utilizes mid-frequency active sonar so it was chosen by U.S. Pacific Fleet as the focal training event for monitoring. Additional (classified) data have been archived since 2011 from Submarine Command Course for post-exercise analysis of marine mammal exposure and response.

Non-systematic boat-based visual surveys were added to the monitoring program beginning in 2012. They have occurred primarily off the Pacific Missile Range Facility in order to utilize localizations from the instrumented range to prioritize species for satellite tag deployment and enable opportunistic behavioral exposure and response analyses. The surveys are scheduled just prior to the Submarine Command Course to maximize the possibility of tagging animals that may stay in close proximity to the range during the training event. Photos and biopsy samples are also collected to feed analysis of occurrence, population structure and habitat use of marine mammals in the archipelago.

Spinner dolphins have been detected during monitoring surveys at the Pacific Missile Range Facility both visually and using passive acoustics. Data collected based on these monitoring survey results are discussed in detail in the Stressor Analysis sections.

K.3.9.1.2 Stressor Analysis

K.3.9.1.2.1 Sonar and Other Transducers

As detailed in Section 3.7.3.1.2 (Impacts from Sonar and Other Transducers), spinner dolphins in Hawaii may be exposed to sound from sonar and other transducers used during training and testing activities throughout the year. Analysis for the entire Hawaii population estimates that most exposures result in behavioral reactions or TTS, and zero exposures at levels of PTS are anticipated. Although the Navy proposes to continue use of mid-frequency active sonar throughout the Hawaii Range Complex, it is likely to be used more frequently and with more short-duration intensity by surface ships off the Pacific Missile Range Facility and further offshore than the extent of the biologically important areas. Spinner dolphins are routinely sighted within or in the vicinity of the range off Kauai (Ampela et al., 2015; Baird et al., 2015b; Baird et al., 2016b; Deakos & Richlen, 2015; U.S. Department of the Navy, 2006b).

Behavioral response studies are being or have been conducted at three U.S. Navy instrumented ranges (the Pacific Missile Range Facility in the Hawaii Range Complex, the Atlantic Undersea Test and Evaluation Center in the Bahamas, and the Southern California Anti-Submarine Warfare Range in the Southern California Range Complex). Methodologies differ in all three (e.g., controlled exposure, tag type); however, results consistently suggest that behavioral response is species and context specific. Monitoring shows that spinner dolphins would not be expected to respond to acoustic stressors in a distressed fashion as discussed in the 2006 Rim of the Pacific Exercise After Action Report (U.S. Department of the Navy, 2006a), and post naval activity surveys and Submarine Commander's Course monitoring from 2014 (Mobley & Deakos, 2015; Mobley et al., 2015). The results of these surveys showed that no animals exhibited unusual behavior or signs of distress, and that there were no strandings as a result of the activities. The impact of mid-frequency active acoustic sonar exposure on behaviors such as feeding and reproduction on this species is not well characterized. However, these three examples represent the best available data for this species with regard to response to mid-frequency acoustic sonar.

On the west coast of the Island of Hawaii, Heenehan et al. (2017a) conducted passive acoustic monitoring and visual surveys across four spinner dolphin embayments between January 2011 and March 2013. Humans drastically altered the daytime soundscape with sound from nearby commercial aquaculture, tourist vessels and swimmers. In the two years of monitoring there was, in August 2011, one recorded mid-frequency sonar event, brief sonar pings were measured at sound pressure levels as high as 45.8 dB re 1 uPa above median noise levels (Heenehan et al., 2017a). There were no observed behavioral reactions by spinner dolphins at the time of the August 2011 event. Given the distance from the source, it is unlikely there were any significant impacts on spinner dolphins resulting from that sound exposure.

Monitoring and research data, albeit with small sample sizes, suggests that individual spinner dolphins do not respond to U.S. Navy mid-frequency active sonar in such a way that would reduce their use of a geographic area or to cause behavioral responses to the extent that behavioral patterns are abandoned or significantly altered.

While impacts on spinner dolphins' natural behaviors due to training and testing with sonar and other transducers may occur within the small and resident population areas, they are unlikely to rise to the

level of significant under NEPA nor would they be sustained for a duration long enough that it caused an animal to be outside of normal daily variations in feeding, reproduction, resting, migration/movement, or social cohesion. Any TTS in the biologically important areas would be minor to moderate, from which the individual dolphin would fully recover quickly.

K.3.9.1.2.2 Explosives

As detailed in Section 3.7.3.1.2 (Impacts from Sonar and Other Transducers), spinner dolphins in Hawaii may be exposed to sound from sound and energy from explosives used during training and testing activities throughout the year. Analysis for the entire Hawaii population estimates that most exposures result in behavioral reactions or TTS, and one exposure at the levels of PTS is anticipated in the Oahu/4-Islands region.

Since most activities that involve underwater detonations and explosive munitions typically occur more than 3 NM from shore with the exception of underwater training ranges that are designated for explosive use, it is unlikely the PTS would occur in the Oahu/4-Islands region. Historical data suggests that explosive events are most likely to be scheduled at either the Puuloa Underwater Training Range (located near the entrance to Pearl Harbor), offshore in W-188, or the range area designated as KAPU HOT in W-192 south of Oahu (see Chapter 2 [Description of Proposed Action and Alternatives], Figures 2.1-2 and 2.1-4). Procedural mitigation, as described in Chapter 5 (Mitigation), is implemented during explosives training and testing which includes the use of lookouts and mitigation zones (sized based on activity), making it unlikely that an animal at the surface would be affected.

Seven groups of spinner dolphins were sighted on the August 1 and 4–6, 2014 post-Rim of the Pacific Exercise (which included the use of explosives) shoreline surveys on Oahu, Maui, Molokai, Lanai, and Kahoolawe. No stranded animals were seen throughout the surveys post naval activities (Mobley & Deakos, 2015). Although Navy monitoring data has added to the scientific base of knowledge on species/stock occurrence, habitat use, and genetics, the Navy is not aware of any research or monitoring data that specifically evaluates spinner dolphin responses to explosives. However, a general discussion of the effects of explosives and blast trauma to marine mammals is discussed in Section 3.7.3.2 (Explosive Stressors).

Navy training and testing activities that use explosives could occur year-round within the Hawaii Range Complex. The identified small and resident population areas are mostly located within nearshore waters where the Navy does not typically conduct activities that involve explosives; the exception being the historically used Puuloa Underwater Training Range on the south shore of Oahu near the Pearl Harbor entrance. While impacts on spinner dolphins' natural behaviors due to training and testing with explosives may occur within the small and resident population areas, they are unlikely to rise to the level of significant under NEPA nor would they be sustained for a duration long enough that it caused an animal to be outside of normal daily variations in feeding, reproduction, resting, migration/movement, or social cohesion. Any TTS in the biologically important areas would be minor to moderate, from which the individual dolphin would fully recover quickly. The potential for biological removal for the Oahu/4-Islands stock is 3.3, where one PTS exposure is modeled. PTS, if it were to occur, could have minor long-term consequences for individuals.

K.3.9.1.2.3 Vessel Strike

As discussed in Section 3.7.3.4.1 (Impacts from Vessels and In-Water Devices), in general, odontocetes move quickly and seem to be less vulnerable to vessel strikes than other cetaceans; however, most small whale and dolphin species have at least occasionally suffered from strikes attributed to small boats and

craft such as jet skis. Generally, odontocetes are more capable of physically avoiding a vessel strike and since some species occur in large groups, they are more easily seen when they are closer to the water surface.

Navy vessels operate differently from commercial vessels in ways that are important to prevent collisions with marine mammals. As described in Section 2.3.3, Standard Operating Procedures, surface ships operated by or for the Navy, have personnel assigned to stand watch at all times, day and night, when a ship or surfaced submarine is moving through the water (underway). Available literature suggests that based on their smaller body size, maneuverability, larger group sizes, and hearing capabilities, most odontocetes would be less likely to be struck by a Navy vessel than mysticetes.

K.3.9.2 Kure and Midway Atolls Spinner Dolphins Small and Resident Population Area

The Kure and Midway Atolls Spinner Dolphin Small and Resident Population Area incorporate waters around Kure and Midway out to 10 NM and covering approximately 4,630 km^2 of water space. It does not overlap with any of the settlement areas described in Section K.1.1.2 (Provisional 2015 Prohibited or Restricted Areas within HSTT Study Area).

K.3.9.2.1 Navy Requirements for Area-Specific Training and Testing

Kure and Midway Atolls are in the Hawaii Temporary OPAREA, which is composed of 2.1 million NM^2 of sea and airspace north and west of Kauai used predominately for research, development and test activities. It is mostly used for missile defense testing, which is not a part of the Proposed Action. Activities in the Temporary OPAREA that are covered in this EIS may include air, surface, and anti-submarine warfare activities. The training and testing activities that typically occur within the area include opportunistic training by individual ships transiting to and from the Western Pacific on deployment or occasional positioning of ships supporting testing or other events and are likely to occur in deeper waters of the large temporary operating area and would not overlap with the small and resident population area.

K.3.9.2.2 Kure and Midway Atolls Spinner Dolphin Small and Resident Population Area Mitigation Considerations

This biologically important area overlaps with the Papahanaumokuakea Marine National Monument, Midway Atoll National Wildlife Refuge, and the Hawaiian Islands National Wildlife Refuge.

The Kure and Midway Atolls biologically important area is seldom, if ever, exposed to any stressors during Navy training and testing and it is highly unlikely that any of activities associated with the Proposed Action would interact in any way with the shallow coastal areas around Kure and Midway Atolls that overlap with the small and resident population area.

There are no predicted acoustic or explosives effects on spinner dolphins in the Kure and Midway Atolls Small and Resident Population Area as a result of quantitative acoustic modeling. The Navy does not propose an increase in activities in the monument or activities that are different from those currently conducted in this area. The proposed activities are consistent and compatible with other uses and the resource protection in this area. See Section 6.1.2.6.1 (Papahanaumokuakea Marine National Monument) for an analysis of the effects from Navy activities on the Monument resources.

K.3.9.3 Pearl and Hermes Reef Spinner Dolphins Small and Resident Population Area

The Pearl and Hermes Reef Spinner Dolphin Small and Resident Population Area incorporate waters around Pearl and Hermes Reef out to 10 NM covering approximately 2,100 km^2 of water space. It does not overlap with any of the settlement areas described in Section K.1.1.2 (Provisional 2015 Prohibited or Restricted Areas within HSTT Study Area).

K.3.9.3.1 Navy Requirements for Area-Specific Training and Testing

Pearl and Hermes Reef are in the Hawaii Temporary OPAREA, which is composed of 2.1 million square NM^2 of sea and airspace north and west of Kauai used predominately for research, development, and test activities. It is mostly used for missile defense testing, which is not a part of the Proposed Action. Activities in the Temporary OPAREA that are covered in this EIS may include air, surface, and anti-submarine warfare activities. The training and testing activities that typically occur within the area include opportunistic training by individual ships transiting to and from the Western Pacific on deployment or occasional positioning of ships supporting testing or other events. These activities are likely to occur in deeper waters of the large temporary operating area and would not overlap with the small and resident population area.

K.3.9.3.2 Pearl and Hermes Reef Spinner Dolphin Small and Resident Population Area Mitigation Considerations

This biologically important area is part of Papahanaumokuakea Marine National Monument, Midway Atoll National Wildlife Refuge, and the Hawaiian Islands National Wildlife Refuge.

The Pearl and Hermes Atolls biologically important area is seldom, if ever, exposed to any stressors during Navy training and testing and it is highly unlikely that any of activities associated with the Proposed Action would interact in any way with the shallow coastal areas around Pearl and Hermes Atolls that overlap with the small and resident population area.

There are no predicted acoustic or explosive effects on spinner dolphins in the Pearl and Hermes Atolls Small and Resident Population Area as a result of quantitative acoustic modeling. The Navy does not propose an increase in activities in the monument or activities that are different from those currently conducted in this area. The proposed activities are consistent and compatible with other uses and the resource protection in this area. See Section 6.1.2.6.1 (Papahanaumokuakea Marine National Monument) for an analysis of the effects from Navy activities on the Monument resources.

K.3.9.3.3 Kauai and Niihau Spinner Dolphins Small and Resident Population Area

The Kauai and Niihau Spinner Dolphin Small and Resident Population Area incorporates waters around Kauai, Niihau, and Kaula Islet out to 10 NM, including two Humpback Whale Special Reporting Areas, one of which is part of the Hawaiian Islands Humpback Whale National Marine Sanctuary, and most of the Kaulakahi Channel between Kauai and Niihau. The area covers approximately 7,220 km^2 of water space. It does not overlap with any of the settlement areas described in Section K.1.1.2 (Provisional 2015 Prohibited or Restricted Areas within HSTT Study Area).

K.3.9.3.4 Navy Requirements for Area-Specific Training and Testing

The Kaulakahi Channel contains shallow water portions of the Pacific Missile Range Facility, a multi-dimensional testing and training range that is a heavily used training and testing area. The Spinner Dolphin Small and Resident Population Area around Kauai and Niihau fully encompasses the Shallow Water Training Range, restricted areas R-3101 and R-3107, and overlaps most of the Barking Sands

Tactical Underwater Range. It also overlaps portions of special use airspace Warning Areas 188(A), 186, and all of W-187 (W-188[A], W-186, and W-187).

The Pacific Missile Range Facility is the largest instrumented multi-environment test range in the world and includes land, sea, and air zones. The Battle Management Interoperability Center contains the operational systems necessary to communicate and coordinate the complex activities involved in live-fire testing and training. The existing infrastructure is unique and irreplaceable, providing a full spectrum of range support, including radar, underwater instrumentation (e.g., bottom-mounted transducers and hydrophones), telemetry, electronic warfare, remote target command and control, communications, data display and processing and target⁄weapon launching and recovery facilities. The Barking Sands Tactical Underwater Range provides underwater tracking and communication for an area of approximately 100 NM^2, and the Shallow Water Training Range covers 80 NM^2.

Both the Barking Sands Tactical Underwater Range and the Shallow Water Training Range are regularly used for anti-submarine warfare, anti-submarine tracking and torpedo exercises, and anti-submarine coordinated/integrated training, such as Submarine Commanders Certification and Rim of the Pacific. The Barking Sands Tactical Underwater Range is also specifically used for Naval Surface Fire Support. The Shallow Water Training Range provides operators with a shallow-water environment to conduct shallow-water sonar proficiency training and readiness under realistic conditions on an instrumented range.

Mine laying events are designed to train forces to conduct offensive (deploy mines to tactical advantage of friendly forces) and defensive (deploy mines for protection of friendly forces and facilities) mine warfare events. Aerial mining lines are generally developed off the southwest coast of Kauai and the southeast coast of Niihau, in W-186 and W-188. Submarine mining events are conducted in W-188. Air operations are conducted within R-3101. Non-explosive mine shapes may be released into the ocean during these training events. W-188 is used for a variety of air warfare and surface warfare exercises including missile and gunnery exercises. However, only the nearshore portions of W-188(A) and W-186 overlap with the Spinner Dolphin Small and Resident Population Area around Kauai and Niihau.

Kaula Islet, southwest of Niihau, is approximately 108 acres of land used by the Navy for fixed- and rotary-wing aircraft gunnery and inert munitions target practice. W-187 and R-3107 surround Kaula Islet. Activities there include bombing and gunnery exercises using non-explosive munitions.

The Pacific Missile Range Facility supports training, tactics development, and testing of air, surface, and subsurface weapons systems for the Navy. The instrumentation on the ranges yields a 10 ft. tracking accuracy, which is crucial for reconstruction, grading and feedback on events. This maximizes the value of available training and testing opportunities. Because of its unique infrastructure and unconstrained range, it is also the lead range for a variety of testing events. Ongoing testing and evaluation programs include torpedo, torpedo defense, submarine and periscope detection, ship-defense systems, missile defense, and other miscellaneous programs (such as gunnery and special weapons tests).

The remainder of the Spinner Dolphin Small and Resident Population Area around Kauai and Niihau that lies outside of Kaulakahi Channel and Navy ranges is not commonly used for training and testing. None of the training and testing areas around Kauai and Niihau are within the Hawaiian Islands Humpback Whale National Marine Sanctuary.

K.3.9.3.5 Kauai and Niihau Spinner Dolphin Small and Resident Population Area Mitigation Considerations

The wide range of training and testing activities at the Pacific Missile Range Facility would be significantly less effective if conducted elsewhere without the feedback and communication provided by the range instrumentation. The combination of the existing range infrastructure and adjacent controlled air, land, and sea space that include shallow water, a channel, and unconstrained deep water cannot be replicated in other locations. Events or portions of events that require quantitative evaluation or specific range support infrastructure in shallow water could not be conducted in other areas of the Hawaii Range Complex. Anti-submarine events and training could not be fully reconstructed and graded to determine outcomes, and Naval Surface Fire Support training directed at the adjacent land could not be fully quantified if these activities were conducted off the range. Shallow water testing events may specifically require the range support services and instrumentation provided by the ranges in order to meet their primary objectives.

The population area covers the entirety of the Shallow Water Training Range and the vast majority of the Barking Sands Tactical Underwater Range. Confining activities to only the portion of the range that lies outside the population area would limit the available sea space to such an extent that most activities would be impossible.

The use of inert exercise mines is generally limited to areas greater than 100 fathoms, or 600 ft. in depth. R-3101 is the only location designated in the Hawaii Range Complex for airborne mine laying. Before dropping non-explosive exercise mines, the crew visually determines that the area is clear. Although the altitude at which non-explosive exercise mines are dropped varies, the potential for drift during descent generally favors release at lower altitudes, where visual searches for marine mammals are more effective. When the non-explosive exercise mine is released, a small parachute retards its entry into the ocean. The mine can be designed to float on the surface, near the surface, or to sink on a tether. Ultimately the mine sinks carrying the parachute with it. Standard Navy procedures are followed for the deployment of non-explosive mines from submarines.

Kaula Islet is an invaluable site for conducting gunnery, bombing, and missile exercises using non-explosive practice munitions, because the small islet is uninhabited and fully surrounded by restricted airspace, which makes it unique. It is particularly useful for smaller events because it is closer to Oahu, whereas Pohakuloa Training Area is used for larger combined events because it supports simultaneous ground force and aviation live-fire training.

Spinner dolphins are a commonly encountered odontocete species in the Pacific Missile Range Facility. Animals within the Spinner Dolphin Small and Resident Population Area could be exposed to sound from sonar or other transducers and sound and energy from explosives, and some behavioral or temporary impacts could occur from the occasional use of mid-frequency active sonar and explosives during training and testing events at the Pacific Missile Range Facility. Despite the long history of Navy training and testing on these ranges, there is no evidence that decades of Navy activities have caused disturbance to natural behavioral patterns to a point where such behavioral patterns are abandoned or significantly altered. The population of spinner dolphins show high site fidelity.

As noted above, spinner dolphins in the Kauai and Niihau population have been monitored occasionally during Navy unit-level training and major training events such as the Rim of the Pacific exercise, beginning in 2006 (HDR, 2010; Mobley & Deakos, 2015; U.S. Department of the Navy, 2006a);there have been no adverse impacts to the Kauai population observed from these training activities. The Navy has

been training and testing in the area with the same basic systems in the Hawaiian Islands for over 40 years and there is no evidence of any adverse impacts having occurred, and there are multiple lines of evidence demonstrating the population's high site fidelity to the area.

Reducing or limiting Navy training and testing in the Kauai and Niihau area as part of geographic mitigation would not be practicable and would compromise personnel safety and reduce the effectiveness of training and testing. One of the primary purposes of the Navy's instrumented range at Kauai is to facilitate a safe training and testing environment for surface vessels and submarines operating simultaneously by acoustically tracking event participants. The instrumented range also enhances the effectiveness of training and testing by enabling the managers overseeing the event to direct participants into specific tactical interactions. Navy training and testing events may require vessels to move around Kauai and Niihau and through the channel separating the islands as an integral part of tactical scenario. Training realism cannot be achieved if pieces of the ocean environment and nearshore waters around the islands of Kauai and Niihau are unavailable for full tactical consideration due to geographic mitigation.

K.3.9.3.6 Oahu and 4-Islands Region Spinner Dolphins Small and Resident Population Area, and Settlement Areas 2-A through 2-D, and 1-B

The Oahu and 4-Islands Region Spinner Dolphin Small and Resident Population Area incorporate waters around Oahu, Maui, Molokai, Lanai, and Kahoolawe out to 10 NM covering over approximately 14,600 km^2 of water space. This population area overlaps with settlement areas 2-A through 2-D, and 1-B and overlaps with Humpback Whale Special Reporting Areas and the Humpback Whale Cautionary Area.

K.3.9.3.7 Navy Requirements for Area-Specific Training and Testing

The 4-Islands Region of the small and resident population area provides a unique training capability that does not exist elsewhere in the Hawaii Range Complex and is an ideal location for anti-submarine and mine warfare because of the bathymetry and bottom type.

The 4-Islands Region provides an environment for anti-submarine warfare search, tracking and avoidance of opposing anti-submarine warfare forces. The bathymetry's unique attributes provide an unmatched opportunity to train in searching for submarines in shallow water. Littoral training allows units to continue to deploy improved sensors or tactics in littoral waters. In the Hawaii portion of the HSTT Study Area specifically, anti-submarine warfare training in shallow water is vitally important to the Navy since diesel submarines typically hide in that extremely noisy and complex marine environment (Arabian Gulf, Strait of Malacca, Sea of Japan, and the Yellow Sea all contain water less than 200 m deep). There is no other area in this portion of the HSTT Study Area with the bathymetry and sound propagation analog to seas where Navy conducts real operations that this training could relocate to. The Navy cannot conduct realistic shallow water training exercises without training in and around the 4-Islands Region. In addition, this area includes unique shallow water training opportunities for unit-level training, including opportunity to practice operations in littoral areas that are both shallow, and navigationally constrained, and in close proximity to deeper open ocean environments.

While submarines do not typically use mid-frequency active sonar, relying primarily on passive sonar (listening mode) to avoid detection from adversaries, submarines are required to train in counter detection tactics, techniques and procedures against threat surface vessels, airborne anti-submarine warfare units and other threat submarines using mid-frequency active sonar as part of both their perspective commanding officers' qualification course and pre-deployment certification. The ability for

surface vessels and air assets to simulate opposing forces, using use mid-frequency active sonar when training with submarines, is critical to submarine crew training for deployed and combat operations. Surface vessels and air assets work with submarines in that area while conducting submarine Commanding Officer's training scenarios that include extended shallow water operations at periscope depth, general surveillance missions in shallow water, shallow water weapons employment, close to shore navigation, shallow water minefield operations, and shallow water ship control. Such training evolutions are necessary for the Commanding Officer to learn the skills necessary, while protecting the vessel, to ensure the crews are capable of executing their mission.

The areas of deep water in the Hawaii Area Tracking System, a non-instrumented range located off the northwest coast of Kahoolawe, provide unique and necessary bathymetry to support submarine post-major maintenance testing and certification. The Hawaii Area Tracking System is also used by submarine crews during Submarine Command Course certification training on anti-submarine warfare and surface warfare missions.

The Kahoolawe mine warfare range contains multiple bottom and tethered mine shapes in shallow water. Instrumentation includes submerged submarine positioning with Submerged Acoustic Navigation System buoys.

Submarine Command Course training is conducted twice a year in Hawaii, in February and August (with approximately three to five days of active sonar use per event). Submarine Command Course training is a Medium Coordinated Anti-Submarine Warfare Training exercise (see Table 2.3-2). The 4-Islands Region is used for Submarine Command Course training as a location to train prospective Submarine Commanding Officers to operate in shallow water.

Consistent with the current HSTT settlement agreement which prohibits the use of in-water explosives within Areas 2-A through 2-D, and 1-B, which overlap with the Spinner Dolphin Small and Resident Population Area, this area has not typically been used for explosives training and testing. However, the area is a valuable training area for shallow water non-explosive torpedo training during the Submarine Command Course. All training in the 4-Islands Region is conducted using non-explosive munitions, and the Maui Basin north of Kahului has been used for shallow water non-explosive torpedo training. Non-explosive exercise torpedo firing could also be scheduled in the area between Maui, Lanai, and Kahoolawe to be used only for summer classes (August). For the winter class (February) exercise torpedo firings will typically be north of Maui to avoid areas of high densities of humpback whales. This is the only location where the Navy can conduct very shallow water firings. These non-explosive torpedoes are recoverable.

Also consistent with the current HSTT settlement agreement, mid-frequency sonar is not used during major training events in Areas 2-A and 2-C, and Navy agreed to limit the use of mid-frequency active sonar for training and testing activities during major training events to one Rim of the Pacific in 2016, one Rim of the Pacific in 2018; three Undersea Warfare Exercises per calendar year; and one Independent Destroyer Certification Exercise per calendar year in Area 1-B.

Littoral Combat Ship training and certification of the anti-submarine and mine warfare mission modules may require use of the Kahoolawe Minefield's shallow water in this area. And unit level anti-submarine warfare training during the basic phase is conducted within this area as is insertion and extraction utilizing small submersible vessels and small boats (rigid-hulled inflatable boats and zodiacs) conducted around the waters off Maui.

This area provides a unique and highly important shallow water training environment in which units can practice operations in littoral areas that are both shallow and navigationally constrained. This network of shallow water inter-island channels is unique within the Eastern and Mid Pacific training range complexes. The area provides an unmatched opportunity for submarines to train in shallow water without the need to use active sonar during their searches. Training and testing in these littoral areas will allow fleet units to continue to deploy improved sensors and tactics in littoral waters into the future. In general, for the Hawaii Range Complex, pushing anti-submarine warfare training farther from land and out of the littorals would add transit time (increased fuel and loss of training time).

The Kaiwi Channel is used routinely for strait transit training within a channel environment for Navy ships stationed in Pearl Harbor. It is a valuable training area for utilizing mid-frequency active sonar detection systems during anti-submarine warfare training when ships are present in this area. While larger, coordinated training events that involve protecting a high-value unit during a strait transit typically occur in the seaspace west of Hawaii Island (a primary venue for carrier strike group training) or in the Alenuihaha Channel, the Kaiwi Channel is used during unit-level and some major training exercises.

The small and resident population area for spinner dolphins also overlaps with the Surface Ship Radiated Noise Measurement System west of the entrance to Pearl Harbor, which evaluates waterborne acoustic characteristics of Navy ships, which provides information to determine corrective actions to reduce a ship's acoustic noise, thus reducing vulnerability to undersea warfare threats.

The Fleet Operational Readiness Accuracy Check Site Range off the west coast of Oahu is associated with in-situ electronic equipment that checks range and bearing accuracy for Navy ships to ensure equipment function and calibration. Systems that are checked include radars, passive sonars, and active sonars. The ship will conduct a series of “runs” on the range, each taking approximately 1.5 hours. Both active and passive sonar can be checked on a single run. During a run, the ship will approach the target, which could be a stationary underwater acoustic transducer located offshore or the shore station, making a slow turn to eventually track outbound from the target, and establishing a bearing to the target in use. This information is compared with the known bearing. During active sonar testing, range-to-target information is also evaluated.

The Shipboard Electronic Systems Evaluation Facility southwest of Oahu provides state-of-the-art test and evaluation of combat systems that radiate or receive electromagnetic energy. The range includes land based test facilities established to provide electromagnetic system test and evaluation services to afloat and shore commands. The facility’s services can be used for the development of new and upgraded systems, and provide a real-time evaluation of a system in an operational environment. Tests are conducted to evaluate ship, shore, and aircraft systems that emit or detect electronic emissions. These systems include those used for radio communications, data transfer, navigation, radar, and systems that identify friend and foe. Either the platform being tested, the Shipboard Electronic Systems Evaluation Facility, or both will transmit specific electronic signals. The test equipment operated by the facility allows for a performance evaluation of the ship, shore, or aircraft system. Tests conducted by the facility fall into one of two broad categories: Quick Look and System Performance tests. Neither test uses munitions or sonar.

Quick Look tests are generally conducted during transit to and from port, or while pier side at Pearl Harbor. These tests provide the ship a quick operational evaluation of the system(s) being tested to detect anomalies or problems. System performance testing provides the ship with a more-detailed

analysis and evaluation of the system(s) under test. System performance tests generally require longer periods of dedicated testing and require the ship to maneuver in pre-defined geometries within a certain geographic area.

There is relatively little tactical training sonar usage in areas overlapping the Spinner Dolphin Small and Resident Population Area around Oahu, but opportunistic unit-level training can occur when ships are in the area. Sonar may be used in W-189, but only a small portion of W-189 overlaps with the population area. Sonar Maintenance and Systems Checks may be done pierside in Pearl Harbor or at sea.

The Naval Defensive Sea Area is a restricted area at Naval Station Pearl Harbor established by Executive Order 8143 of May 26, 1939, and controlled by the Navy. The Naval Defensive Sea Area encompasses areas where underwater training for training and testing activities would occur, specifically diving and salvage operations. The Naval Defensive Sea Area includes Pearl Harbor Channel, where activities include submarine navigation with sonar, sonar system maintenance and systems checks, and vessel operations. In-port activities like Civilian Port Defense – Homeland Security Anti-Terrorism/Force Protection Exercises, pier-side system checks, swimmer defense, and small boat operations occur in Pearl Harbor. Access to the area is restricted.

The Puuloa and Barbers Point Underwater Ranges and the Ewa Training Minefield are restricted areas used for mine neutralization and special warfare operations. Mine neutralization involves the detection, identification, evaluation, rendering safe, and disposal of mines and unexploded munitions that constitutes a threat to ships or personnel. Mine neutralization training is conducted by a variety of air, surface, and sub-surface assets. Tactics for neutralizing ground or bottom mines involve a diver placing a specific amount of explosives which, when detonated underwater at a specific distance from a mine, results in neutralization of the mine. Floating, or moored, mines involve the diver placing a specific amount of explosives directly on the mine. The Navy deploys divers in very shallow water depths (10–40 ft.) to locate mines and obstructions. Additionally, the Puuloa Underwater Range is also used for diving and salvage operations and the Ewa Training Minefield is used by surface ships for mine avoidance training.

Marine Corps Base Hawaii and Marine Corps Training Area Bellows are used for Amphibious Warfare Expeditionary Assault, mine neutralization, swimmer insertion/extraction, and special warfare operations.

Only a small, nearshore portion of W-189 overlaps with the Oahu and 4-Islands Region Spinner Dolphin Small and Resident Population Area. W-189 is used for both surface and air operations, specifically Air Combat Maneuver, during which no live munitions are used, only chaff and flares. W-189 is routinely used by Navy MH-60 helicopters and Marine Corps rotary wing aircraft based out of Marine Corps Base Hawaii. The limited distance from land that rotary wing can travel because of fuel limitations and safety factors dictate the use of this area versus other areas. However, non-explosive gunnery and rockets and dipping sonar used during anti-submarine warfare training would likely occur further offshore in W-189, and not within the biologically important area around Oahu.

The Oahu and 4-Islands Region Spinner Dolphin Small and Resident population area also covers the shallow portions of the Alenuihaha Channel along the southeast coast of Maui. The Alenuihaha Channel offers a unique training capability that does not exist elsewhere in the Hawaii Range Complex and is an ideal location for strait transits using mid-frequency active sonar and combined Carrier Strike Group Operations. However, the coastal waters of the Oahu and 4-Islands Region population area do not extend across the channel and may only overlap with some portions of those operations. The

Alenuihaha Channel is an ideal location for strait transits using mid-frequency active sonar to provide the ability for an aircraft carrier to defend itself from submarine attack while transiting a strait is critical to its survival in forward operating areas (areas of deployment). The Alenuihaha Channel is an actual channel which serves as a proxy for these vital strait transits and provides valuable training realism.

The Alenuihaha Channel is adjacent to waters approaching Kawaihae Harbor, the point of amphibious insertion for forces proceeding to the live-fire range at Pohakuloa Training Area. The Pohakuloa Training Area is the only range in the Hawaii Range Complex that supports ground force and aviation live-fire training. Training in this area allows for the integration of carrier strike group operations and amphibious landings. The Alenuihaha Channel allows sea, air, and land-based units to work in conjunction with one another in controlled airspace in close proximity to the Pohakuloa Training Area range, the only range of its kind in Hawaii. The area is located outside most of the civilian air traffic corridors approaching the Honolulu International Airport which is necessary to safely de-conflict with civilian air traffic.

K.3.9.3.8 Oahu and 4-Islands Region Spinner Dolphin Small and Resident Population Area Mitigation Considerations

Predicted effects on individuals to the Oahu and 4-Islands Region spinner dolphin population are expected to be behavioral in response to the use of sonar and other transducers (see Appendix E, Estimated Marine Mammal and Sea Turtle Impacts from Exposure to Acoustic and Explosive Stressors Under Navy Training and Testing Activities). As presented in Section 3.7.1.3.2.2 (Impact Ranges for Sonar and Other Transducers), behavioral impacts from a mid-frequency sonar source on a spinner dolphin could, theoretically, occur at distances of tens of nautical miles from that designated area. The Oahu portion of the designated Oahu and 4-Islands Region spinner dolphin area overlaps the Naval Defensive Sea Area, the Pearl Harbor Channel and harbor itself, underwater ranges at Puuloa and Barbers Point, the Ewa Training Minefield, the amphibious warfare training beaches and waters of Marine Corps Base Hawaii and Marine Corps Training Area Bellows, the Fleet Operational Readiness Accuracy Check Site Range and Surface Ship Radiated Noise Measurement System off the west Oahu coast. All these areas and their use are critical to the Navy's basic operations (such as access to Pearl Harbor), critical to the requirements (such as the shallow water diver training area at the Puuloa Underwater Range), and critical to the effectiveness of specific training requirements as detailed previously.

System checks at the Fleet Operational Readiness Accuracy Check Site Range cannot be completed anywhere else because they require infrastructure on the seafloor and on the adjacent land. While some Shipboard Electronic Systems Evaluation testing can be completed while in port, more detailed analyses require specific maneuvering on the range. If these system checks could not be conducted Navy combat, communications, and navigational systems could go out of calibration without the operators' knowledge. That could make Navy platforms unable to accurately resolve their targets, unable to correctly position themselves and increase the risk of collisions and grounding, or could make Navy ships more vulnerable to electronic warfare. Pier-side sonar testing cannot practically be done outside Pearl Harbor. Submarine navigation using sonar in the Pearl Harbor channel is required to exit port safely before the submarine leaves the area and submerges.

Activities on the Puuloa and Barbers Point Underwater Ranges and the Ewa Training Minefield occur there because access is controlled, and because these areas are shallow and close to Oahu shore facilities for small boat access. Training and testing using in-water explosives within the Oahu and 4-Islands Region Spinner Dolphin Small and Resident Population Area will only occur on designated

underwater training ranges or Special Use Airspace. Flying or sailing those units and all their equipment to the Pacific Missile Range Facility for all of their required training would be impractical. The only Special Use Airspace that overlaps this population area is W-189, but most materials will be expended in deeper waters beyond the biologically important area. All training and testing outside of the ranges and W-189 (i.e., the entire 4-Islands Region portion of the biologically important area) is conducted using non-explosive munitions.

While Kaiwi Channel between Molokai and Oahu is not routinely used for training that involves strait transiting while protecting high-value units, this channel provides for opportunistic training within a channel environment for Navy ships based in Pearl Harbor. The Kaiwi Channel also overlaps partially with the Aloha submarine transit lane where some opportunistic mid-frequency active sonar and anti-submarine warfare training occurs when ships and submarines are present in this area. Overall, this area is characterized as an area of "low use" for mid-frequency active sonar.

There are no alternative locations to Pearl Harbor, Marine Corps Base Hawaii, shallow water areas of Oahu, and other associated Oahu water space such as the Fleet Operational Readiness Accuracy Check Site Range. When balanced with the practicality of implementing additional mitigation measures or altering ongoing activities to avoid use of the Oahu portion of the spinner dolphin small and resident population area, establishing mitigation areas around Oahu would adversely affect military readiness.

Training effectiveness of the Submarine Command Course certification training would be compromised if units were forced to adhere to year-round restrictions and prohibitions against using all mid-frequency active sonar in the 4-Islands Region area and units were instead forced to operate strictly on the Pacific Missile Range Facility ranges. The training value within the 4-Islands Region is much higher due to the challenging bathymetry.

Unit level anti-submarine warfare training within the 4-Islands Region area, because of its unique shallow water environment, would be difficult to replicate elsewhere within the Hawaii Range Complex. Such a shift in location would result in a loss of shallow water operating experience and would compromise a submarine crew's ability to retain and improve their capabilities and to train with new emerging technologies.

However, since the 4-Islands Region Mitigation Area (Figure K.2-3) overlaps partially with the 4-Islands Region Spinner Dolphin Small and Resident Population Area where surface ship hull-mounted mid-frequency active sonar is restricted from November 15 to April 15 during the humpback whale reproductive season and explosives are restricted year-round, implementing this additional mitigation would provide further protection to spinner dolphins in the small and resident area. See Section K.2.2 (Mitigation Areas to be implemented) for details on proposed mitigation areas.

K.3.9.4 Hawaii Island Spinner Dolphins Small and Resident Population Area

The Hawaii Island Spinner Dolphin Small and Resident Population Area cover waters around the Hawaii Island out to 10 NM covering over approximately 9,470 km^2 of water space. This population area overlaps with portions of settlement areas 1-A through 1-E, and 2-E and the Humpback Whale Special Reporting Area along the northeast coast of Hawaii Island.

K.3.9.4.1 Navy Requirements for Area-Specific Training and Testing

The Alenuihaha Channel, as well as the waters north and west of Hawaii Island, provides a unique training capability that does not exist elsewhere in the Hawaii Range Complex. The Alenuihaha Channel

is an ideal location for strait transits using mid-frequency active sonar during training. The Alenuihaha Channel is an actual channel that provides a vital and realistic analog for similar straits or restricted maneuvering areas where the Navy operates worldwide, such as the East or South China seas. For example, transit training in the Alenuihaha Channel replicates these types of strait environments that meet the Navy's requirement to deploy Naval forces to ensure the free flow of commerce and the freedom of navigation by combatting piracy or mine threats. Naval forces are required to train to counter a submarine threat before deployment to ensure such forces obtain the required proficiency to conduct anti-submarine warfare in a controlled and observed environment prior to deployment to international straits across the globe, where operational Commanders require Naval forces to be able to conduct a range of military operations, including anti-submarine warfare. This required proficiency cannot be replicated by simulation and is most effectively obtained when conducted in a strait. Commanding Officers cannot be expected to effectively conduct such operations in a deployed environment if the first time they encounter a submarine in a strait is in a deployed setting. There are few geographic areas that enable forces to do this type of training outside of the HSTT Study Area.

The ability of an aircraft carrier to defend itself from submarine attack with all available assets while conducting straits transits is critical to its survival in forward operating areas. The channel is located outside most of the civilian air traffic corridors approaching the Honolulu International Airport which is necessary to safely de-conflict with civilian air traffic.

While there are other channels within the Hawaii Range Complex used for strait transit training and anti-submarine warfare training, none provide the important attributes of the Alenuihaha Channel. The Alenuihaha Channel's proximity to the Pohakuloa Training Area allows for realistic training and reduces time and fuel costs between these training areas. The channel between Niihau and Kauai is also acceptable from a training perspective, but this would add at least two days of transit during each Under Sea Warfare training exercise (time required to move through a different channel and reposition to operating areas near Pohakuloa Training Area). The Kaiwi Channel between Oahu and Molokai is also acceptable from some mid-frequency active sonar training perspective, but it is also a significant civilian air corridor, and raises safety concerns for anti-submarine warfare aircraft flying in that channel. In addition, the channel between Nihau and Kauai is proximate to the Pacific Missile Range Facility instrumented range) which would result in problems de-conflicting multiple activities and hazardous operations, raising safety concerns. For these reasons, Alenuihaha Channel is still the most suitable for anti-submarine warfare training during certain training scenarios.

The channel between Oahu and Molokai is also acceptable from some mid-frequency active sonar training perspective, but it is also a significant civilian air corridor, and raises safety concerns for anti-submarine warfare aircraft flying in that channel. In addition, the channel between Nihau and Kauai is proximate to the Pacific Missile Range Facility instrumented range which would result in problems de-conflicting multiple activities and hazardous operations, raising safety concerns. The channel between Oahu and Molokai is located under a significant civilian air corridor, and its use would raise safety concerns for anti-submarine warfare aircraft flying in that channel during major training events. For these reasons, Alenuihaha Channel is still the most suitable for anti-submarine warfare training.

The Hawaii Island Spinner Dolphin Small and Resident Population Area is adjacent to waters approaching Kawaihae Harbor, the point of amphibious insertion for forces proceeding to the range at Pohakuloa Training Area, which is the only range in the Hawaii Range Complex that supports ground force and aviation live-fire training. Training in this area allows for the integration of carrier strike group operations and amphibious landings, working in conjunction within a controlled airspace west of Hawaii

Island for military training near the Pohakuloa Training Area range. Carrier strike group training can include a full spectrum of the force ¬ various ships, submarines, aircraft, and Marine Corps forces – to train in the complex command, control operational coordination, and logistics functions designed to prepare forces for deployment. As an air to ground range, Pohakuloa Training Area supports carrier strike group activities near a channel and near large open water areas for strike group maneuvering and submarine activities. Mid-frequency active sonar conducted to support strike maneuver and protect high value units (e.g., carrier) as aircraft go to strike at Pohakuloa Training Area is vital.

Access to both the Alenuihaha Channel and the waters west of Kawaihae Harbor is vital for a broad spectrum of naval and amphibious training. These areas provide a unique and irreplaceable capability within the Hawaii Range Complex that allows naval forces to conduct realistic, integrated training in an environment that replicates the actual areas where they will be called to serve. Training and testing using in-water explosives are not typically conducted within the boundaries of the Hawaii Island Spinner Dolphin Small and Resident Population Area as this area is not a designated underwater training range nor is it within Special Use Airspace.

K.3.9.4.2 Hawaii Island Spinner Dolphin Small and Resident Population Area Mitigation Considerations

The designated Hawaii Island spinner dolphin biologically important area overlaps the Alenuihaha Channel and the waters west of Kawaihae Harbor which are used for a broad spectrum of naval and amphibious training. As discussed above, these areas provide a unique capability within the Hawaii Range Complex that allows naval forces to conduct realistic, integrated training. Restricting mid-frequency active sonar training in the Alenuihaha Channel would force the separation or relocation of portions of Undersea Warfare training, Independent Deployer Certification training, Rim of the Pacific, and unit level training exercises to other channels in the Hawaiian OPAREAs further from the Pohakuloa Training Area range. Undersea Warfare certification training occurs up to three times per year; Rim of the Pacific occurs once every two years; Independent Deployer Certification training occurs once per year. Segmenting these training events over time and space would result in an unacceptable loss of realism, could result in increased safety risks, and would erode strike group readiness. Additionally, the small and resident population area does not extend across the channel, so only a portion of these activities may overlap with the biologically important area.

The identified small and resident population area only overlaps with a very small portion of the Hawaii Range Complex and is located within nearshore waters where the Navy does not typically conduct activities that involve sonar or other transducers, especially more intense activities such as anti-submarine warfare training or major training events. However, animals within the Spinner Dolphin Small and Resident Population Area could be exposed to sound from sonar or other transducers and some behavioral or temporary impacts could occur from the occasional use of mid-frequency active sonar during Undersea Warfare training, Independent Deployer Certification training, and Rim of the Pacific training.

While geographic mitigation would not be practicable to implement across all of the identified biologically important areas for spinner dolphin given that the population areas encompass all shallow waters around all of the main Hawaiian Islands and parts of the Northwest Hawaiian Islands, the Navy proposes to implement a mitigation area that overlap some portions of the Spinner Dolphins Small and Resident Population Areas in the nearshore areas around Hawaii Island. While this mitigation area is designed to provide additional protection for humpback whales, false killer whales and beaked whale species, these measures will also likely reduce the number and level of impacts to other species or

stocks occurring within the area, including spinner dolphin. See Section K.2.4 (Mitigation Areas to be implemented) for details on these proposed mitigation areas.

K.3.9.5 Spinner Dolphin Small and Resident Population Areas Mitigation Assessment

Navy quantitative analysis does not estimate any injury to spinner dolphins during training due to exposure to explosives or sonar. Spinner dolphins are most likely to respond to exposures to sonar and other transducers with short-term behavioral reactions and minor to moderate TTS.

While impacts on spinner dolphins' natural behaviors due to training and testing with sonar and other transducers may occur within the small and resident population area, they are unlikely to rise to the level of significant under NEPA nor would they be sustained for a duration long enough that it caused an animal to be outside of normal daily variations in feeding, reproduction, resting, migration/movement, or social cohesion. Any TTS in the biologically important areas would be minor to moderate, from which the individual dolphin would fully recover quickly. One PTS due to explosives exposure is estimated in the Oahu-4-Islands region, where the potential for biological removal is 3.3, therefore impacts on the population are not anticipated.

The Navy balanced the need for the use of the areas to meet training and testing requirements with the biological importance of the area to spinner dolphins and other species occurring in the area. The Navy determined that establishing the following mitigation areas would likely reduce the number and level of impacts to this species and other species or stock, including false killer whales, humpback whales, Cuvier and Blainville's beaked whales, pygmy killer whales, dwarf sperm whales, melon-headed whales, short-finned pilot whales and other dolphin species occurring within the area without compromising military readiness:

1. Hawaii Island Mitigation Area – limits the amount of surface ship hull-mounted, mid-frequency active sonar (MF1) and dipping sonar (MF4) and restricts the use of explosives during testing, unit level training and major training exercises year-round (Figure K.2-2); and
2. 4-Islands Region Mitigation Area – restricts surface ship hull-mounted, mid-frequency active sonar (MF1) during training and testing in the mitigation area from November 15 through April 15. In addition, the Navy will restrict the use of explosives during training and testing in the 4-Island Regions Mitigation Area, year-round (Figure K.2-3).

See Section K.2.2 (Mitigation Areas to be Implemented) for more details on the above mitigation areas.

As discussed in Section K.3.9.4.1 (Navy Requirements for Area-Specific Training and Testing), due to the strategic importance of the Alenuihaha Channel, the Navy cannot completely prohibit the use of surface ship hull-mounted mid-frequency active sonar or dipping sonar during training and testing; however, the Navy proposes to limit the amount of surface ship hull-mounted mid-frequency active sonar and dipping sonar used in the channel. The limited use of these sonar systems still allows naval forces to train in an environment that replicate strategic straits to which they will operate while likely reducing the number and level of impacts to spinner dolphins as well as for other marine mammal species or stocks occurring within the area without compromising military readiness.

Navy vessels operate differently from commercial vessels in ways that are important to prevent whale collisions. As described in Section 2.3.3 (Standard Operating Procedures), surface ships operated by or for the Navy, have personnel assigned to stand watch at all times, day and night, when a ship or surfaced submarine is moving through the water (underway). Available literature suggests that based on their smaller body size, maneuverability, larger group sizes, and hearing capabilities, most odontocetes

would be less likely to be struck by a Navy vessel than mysticetes. Generally, odontocetes (including spinner dolphins) are more capable of physically avoiding a vessel strike and since some species occur in large groups, they are more easily seen when they are closer to the water surface.

As discussed in Section 3.0.3.3.4.1 (Vessels and In-Water Devices), large Navy ships typically operate at average speeds of between 10 and 15 knots, which for reference is slower than large commercial vessels, such as container ships that steam at approximately 24 knots during normal operations (Maloni et al., 2013). Operating vessels at speeds that are not optimal for fuel conservation or mission requirements would be unsustainable due to increased time on station and increased fuel consumption. Each ship has a limited amount of time that it can be underway based on target service requirements and ship schedules. Ship schedules are driven largely by training cycles, scheduled maintenance periods, certification schedules, and deployment requirements. Because of the complex logistical considerations involved with maintaining ship schedules, the Navy does not have the flexibility to extend the amount of time that ships are underway during training and testing, which would result from vessel speed restriction mitigation. If the Navy were to incorporate vessel speed restrictions into event planning for approximately 3–6 months out of the year, ships would be unable to meet all of their requirements during their limited time available to be underway. This would hold true even if the restrictions only applied to transits to and from training or testing event locations and not during the events themselves. Therefore, it would not be practicable for the Navy to implement speed restrictions within the biologically important areas.

As described in Section 5.3.4.1 (Vessel Movement), additional vessel speed restrictions would prevent vessel operators from gaining handling proficiency, would prevent the Navy from properly testing vessel capabilities, and would increase required the time on station during training or testing events to build skill proficiency or properly test vessel capabilities (which would significantly increase fuel consumption); therefore, the proposed mitigation would have significant impacts on the Navy's ability to train and test, and would prevent the Navy from meeting its mission requirements.

Mitigation measures described in Chapter 5 (Mitigation) are designed to avoid or reduce impacts to marine species and stocks throughout the Study Area. These measures would also limit the interaction between Navy vessels and humpback whales, further reducing the potential for vessel strikes in and outside of identified biologically important areas.

K.3.10 Hawaii Island Rough-Toothed Dolphins Small and Resident Population Area

A single area off the west coast of Hawaii Island for the small and resident population of rough-toothed dolphins has been identified as biologically important (Figure K.3-18). The area covers approximately 7,170 km^2 of water space off the west coast of Hawaii Island in water depths ranging from 38 m to over 4,800 m (Baird et al., 2015a). The year-round area is triangular in shape and was delineated to encompass all sighting locations off the west coast of Hawaii (Baird et al., 2015a). As shown in Table K.1-1, and described in Section K.1.1.2, Provisional 2015 Prohibited or Restricted Areas within HSTT Study Area, the Rough-toothed Dolphin Small and Resident Population Area overlaps with HSTT Settlement Areas 1-C through 1-E.

K.3.10.1 General Biological Assessment

For a thorough description of the rough-toothed dolphin species, see Section 3.7.2.3.18 (Rough-toothed Dolphin [*Steno bredanensis*]).

This species is protected under the MMPA and is not listed under the ESA. Rough-toothed dolphins are among the most widely distributed species of tropical dolphins, but little information is available regarding population status (Jefferson et al., 2015). There is a single Pacific management stock for rough-toothed dolphins found within the U.S. Exclusive Economic Zone of the Hawaiian Islands

K.3.10.1.1 Biological Considerations Applicable to the Rough-toothed Dolphins Small and Resident Population Area

There is no evidence indicating that the rough-toothed dolphins migrate. Rough-toothed dolphin vocalizations have been detected during acoustic surveys in the eastern tropical Pacific (Oswald et al., 2003). The rough-toothed dolphin is regarded as an offshore species that prefers deep water habitat, but the dolphins are also known to occur in waters with variable depths (Baird et al., 2015b; Gannier & West, 2005; Pittman et al., 2016). Rough-toothed dolphins rarely occur close to land, except around islands where the bathymetry drops-off steeply (Baird et al., 2015b; Davis et al., 1998; Gannier & West, 2005; Lodi & Hetzel, 1999; Mignucci-Giannoni, 1998; Ritter, 2002).

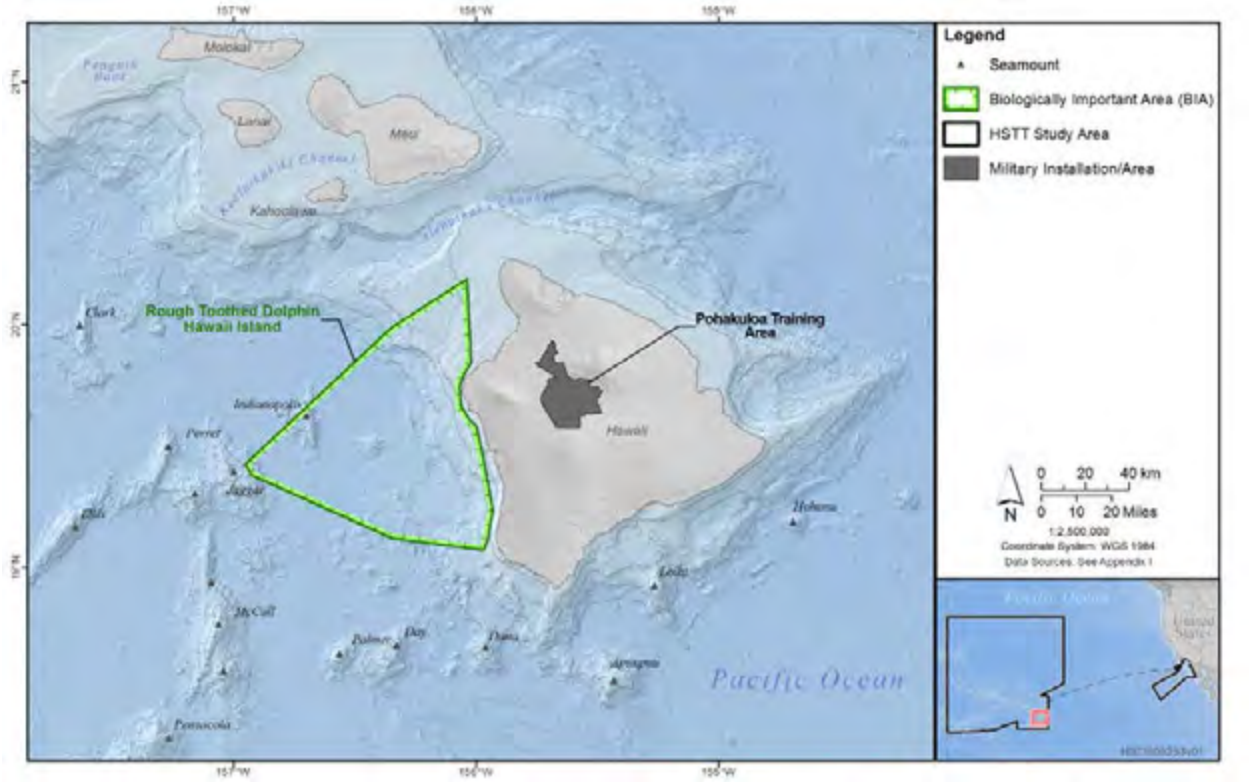


Figure K.3-18: Rough-Toothed Dolphin Small and Resident Population Area off Hawaii Island

Rough-toothed dolphins are well known in deep ocean waters off Hawaii but are also seen relatively frequently during nearshore surveys (Baird et al., 2008; Baird et al., 2015b; Barlow et al., 2008; Bradford et al., 2013; Carretta et al., 2015; Pitman & Stinchcomb, 2002; Shallenberger, 1981; Webster et al., 2015). During the NMFS 2010 survey of the Hawaiian Islands, this species was encountered 24 times and has been observed as far northwest as Pearl and Hermes Reef in the Northwest Hawaiian Islands (Bradford et al., 2013). Habitat-based models developed from systematic ship survey data collected in the central North Pacific show the strong island association of rough-toothed dolphins (Becker et al., 2012; Forney et al., 2015). Over a 10-day nearshore survey effort off Kauai in 2014, rough-toothed

dolphins were encountered on two occasions and seven of the eight individuals photo-identified had been observed in previous years (Baird et al., 2015b). Data from 14 satellite tags deployed off Kauai between 2011 and 2015 on rough-toothed dolphins indicated a large portion of the core area for those animals overlaps the Pacific Missile Range Facility and the channel between Kauai and Niihau (Baird et al., 2015b). The data presented by Baird et al. (2015b) and Webster et al. (2015) are indicative of residency on or near the Pacific Missile Range Facility by some of those animals (Baird et al., 2008). Because there is insufficient data at present, the area has not been identified as a biologically important area for this small resident population off Kauai (Baird et al., 2015a).

Unpublished data from small boat surveys off Hawaii Island between 2002 and 2014 have provided sighting locations and genetic evidence indicative of the resident population off Hawaii Island (Baird et al., 2015a). Pittman et al. (2016) reported on sightings of 2,928 rough-toothed dolphins over 240 line transects conducted in both summer and winter from 1993 to 2013. The data were integrated from multiple sources and used to support spatially explicit predictive models of species occurrence in the main Hawaiian Islands. While the results of the winter and summer models predicted highest abundance in offshore waters with depths greater than 200 m, the predicted distribution from the winter model did not correspond as well with sightings data. The model predicted that waters around Oahu and Maui are areas of lower abundance, but there were a number of sightings in these areas, which contradicts the model-predicted distribution (Pittman et al., 2016). Sea surface temperature and current were two important environmental variables driving the winter model, which predicted highest relative abundance over the Hawaii seamounts on the western side of Hawaii Island. High relative abundance was also predicted in the Kaulakahi Channel between Kauai and Niihau, which, based on photo-identification data and genetic analysis has been hypothesized as a separate population (Albertson et al., 2011; Baird et al., 2008; Oleson et al., 2013; Pittman et al., 2016, Baird, 2008). The summer model, driven by chlorophyll-a concentrations, predicted highest relative abundance in deep waters of the Kaulakahi Channel; off the west side of Oahu; the Kaiwi Channel and offshore of Halawa Bay, Molokai; Auau Channel; Alalakeiki Channel southeast of Kahoulawe; and off the west side of Hawaii Island off of Hanamalo Point and Keahole Point (Pittman et al., 2016). Given the discrepancies between the spatial models and sighting data, these models using oceanographic features do not provide an adequate basis to propose geographic mitigation. Oceanographic features or conditions such as changes in sea surface temperature have been shown to influence the behavior of odontocetes (Baumann-Pickering et al., 2016b) and these features are not necessarily linked to particular geographic areas, therefore geographic mitigation limiting activities based on oceanographic conditions is not likely to increase the effectiveness of the Navy's current mitigation and would not be practical to implement.

The presence of rough-toothed dolphins has been surmised based on passive acoustic detection of low-frequency whistles south of Oahu, and beyond the identified biologically important area (Klinck et al., 2015). Between December 11, 2014 and January 26, 2015, a passive acoustic survey was conducted in the Hawaii Range Complex using an autonomous glider fitted with an acoustic receiver. The survey began and ended approximately 120 km south of Honolulu, Oahu, navigating a circular track through deep ocean waters that intermittently crossed over or near multiple seamounts. Low-frequency whistles and clicks were detected and likely associated with four species based on the frequency characteristics of the whistles: false killer whale, short-finned pilot whale, melon-headed whale, and rough-toothed dolphin. The whistles were most often detected near bathymetric features (e.g., seamounts) (Figure K.3-11).

K.3.10.1.2 Stressor Analysis

K.3.10.1.2.1 Sonar and Other Transducers

As detailed in Section 3.7.3.1.2 (Impacts from Sonar and Other Transducers), rough-toothed dolphins in Hawaii may be exposed to sound from sonar and other transducers used during training and testing activities throughout the year. Analysis for the entire Hawaii population estimates that all exposures result in behavioral reactions or TTS, and zero exposures resulting in PTS are anticipated. Navy training and testing activities that use sonar and other transducers could occur year-round within the Hawaii Range Complex. This identified small and resident population area only takes up a very small portion Hawaii Range Complex; therefore, sonar use in this area would be infrequent and typically only last for a short duration if it did occur. The sound from sonar or other transducers could still expose animals within the rough-toothed dolphin small and resident population area to acoustic stressors and some impacts on behavior could occur.

Results from satellite tag data during training events using mid-frequency sonar off Kauai have not observed any large scale movements of rough-toothed dolphins as a result of exposure to sonar (Baird et al., 2014b; Baird et al., 2017). While impacts on rough-toothed dolphin natural behaviors due to training and testing with sonar and other transducers may occur within the small and resident population area, they unlikely to rise to the level of significant under NEPA nor would they be sustained for a duration long enough that it caused an animal to be outside of normal daily variations in feeding, reproduction, resting, migration/movement, or social cohesion. Any TTS in the biologically important areas would be minor to moderate, from which the individual would fully recover quickly.

K.3.10.1.2.2 Explosives

As detailed in Section 3.7.3.2.2 (Impacts from Explosives) for rough-toothed dolphins, Navy training and testing activities that use explosives could occur year-round within the Hawaii Range Complex; however, most activities that involve underwater detonations and explosive munitions typically occur more than 3 NM from shore in areas that are designated for explosive use. A single exposure to TTS and PTS for this species are estimated to occur throughout the entire HRC based on acoustic modeling for explosives. However, historical data suggests that explosive events are most likely to be scheduled at Puuloa Underwater Training Range, W-188, or KAPU HOT in W-192 south of Oahu (Figure K.3-3) for ease of scheduling, safety, instrumentation, and airspace concerns, all of which are outside the biologically important area for this species. Therefore, it is unlikely that TTS or PTS for these species would occur within the biologically important area for rough-toothed dolphins. Very few impacts on behavior were estimated to occur as a result of exposures to explosives. As discussed in Section 3.7.3.2.2. (Impacts from Explosives), rough-toothed dolphin reactions to sound are most likely short term and mild to moderate, especially when sound sources are located more than a few kilometers away or when the animals are engaged in important biological behaviors. Therefore, significant impacts on rough-toothed dolphin natural behaviors or abandonment of habitat due to training and testing with explosives are unlikely to occur within the small and resident population area.

K.3.10.1.2.3 Vessel Strike

As discussed in Section 3.7.3.4.1 (Impacts from Vessels and In-Water Devices), in general, odontocetes move quickly and seem to be less vulnerable to vessel strikes than other cetaceans; however, most small whale and dolphin species have at least occasionally suffered from strikes attributed to small boats and craft such as jet skis. Generally, odontocetes are more capable of physically avoiding a vessel strike and

since some species occur in large groups, they are more easily seen when they are closer to the water surface.

Navy vessels operate differently from commercial vessels in ways that are important to prevent collisions with marine mammals. As described in Section 2.3.3 (Standard Operating Procedures) surface ships operated by or for the Navy, have personnel assigned to stand watch at all times, day and night, when a ship or surfaced submarine is moving through the water (underway). Available literature suggests that based on their smaller body size, maneuverability, larger group sizes, and hearing capabilities, most odontocetes would be less likely to be struck by a Navy vessel than mysticetes.

K.3.10.1.3 Hawaii Island Rough-toothed Dolphins Small and Resident Population Area, and Settlement Areas 1-C through 1-E

The Hawaii Island Rough-toothed Dolphin Small and Resident Population Area identified in Baird et al. (2015a) incorporates the offshore approach into Kawaihae Harbor on the northwest coast of Hawaii Island; is overlapped by W-194 and Pele and Pele South Air Traffic Control Assigned Airspace; and overlaps with Settlement Areas 1-C through 1-E.

K.3.10.1.4 Navy Requirements for Area-Specific Training and Testing

The Rough-toothed Dolphin Small and Resident Population Area incorporates the offshore approach into Kawaihae Harbor on the northwest coast of Hawaii Island. This small and resident population area west of Hawaii Island is overlapped by W-194 and Pele and Pele South Air Traffic Control Assigned Airspace which are necessary for carrier and expeditionary strike training into the Pohakuloa Training Area range. The waters west of Kawaihae Harbor are used for a broad spectrum of naval and amphibious training. These areas provide a unique capability within the Hawaii Range Complex that allows naval forces to conduct realistic, integrated training in an environment that replicates the actual areas where they will be called to serve. The Hawaii Island is unique in that it is provides the only capable air-to-ground range able to conduct carrier and expeditionary strike group activities near a channel with unfettered access to the open ocean. Open ocean areas support strike group maneuvering, using mid-frequency active sonar to prosecute (detect/track) a submarine in the vicinity of a high value unit (e.g., carrier) as aircraft execute strikes into Pohakuloa Training Area. The area around Hawaii Island is also used by surface ships with anti-submarine warfare capability to train to clear the sea space from any submarine threat before Marines go ashore at Kawaihae Harbor (part of Rim of the Pacific and Marine Corps unit level training scenarios). There are limited locations for amphibious landings in Hawaii due to existing environmental concerns. The west coast of Hawaii is one of the best locations for integrated joint marine amphibious operations into Pohakuloa Training Area, not only due to its close proximity to Pohakuloa Training Area, but because the approaches to those beaches are under controlled airspace.

Controlled airspace areas on the west side of Hawaii Island are important safe areas in which military aircraft operations are de-conflicted with civilian air traffic. The Navy uses W-194 and the Pele and Pele South Air Traffic Control Assigned Airspace for Rim of the Pacific (every other year) and Undersea Warfare certification training (up to three times/year), and possibly the Independent Deployer Certification training once every year. The controlled airspace combined with access to the Pohakuloa Training Area range drives Undersea Warfare certification training to that particular location, by supporting the required extensive coordination with multiple air and sea assets. Driving military readiness activities further off shore would require longer transits—costing time and additional fuel, increasing safety risks, and eroding training realism.

Activities utilizing in-water explosives, such as underwater detonations, bombing or torpedo exercises, are not conducted in the nearshore waters within the Rough-toothed Dolphin Small and Resident Population Area since it is not within a designated underwater training range or within Special Use Airspace, typically necessary for in-water explosive usage. In-water explosives may be used further offshore in a portion of W-194 where it overlaps with the Rough-toothed Dolphin Small and Resident Population Area; however, explosives are most likely to occur offshore in W-188, or the range area designated KAPU HOT in W-192 south of Oahu (see the EIS/OEIS Chapter 2, Description of Proposed Action and Alternatives, Figures 2.1-2 and 2.1-4).

K.3.10.1.5 Rough-toothed Dolphin Small and Resident Population Area Mitigation Assessment

The identified small and resident population area only takes up a small portion of the Hawaii Range Complex and is located within waters where the Navy typically conducts activities that involve sonar or other transducers during Undersea Warfare training, Independent Deployer Certification training, and Rim of the Pacific training.

Rough-toothed dolphin in Hawaii may be exposed to sound from sonar and other transducers used during training and testing activities throughout the year. The quantitative analysis estimates the majority of exposures result in either behavioral reactions or TTS; PTS was not estimated from exposures to sonar and other transducers under either Alternative.

The Navy proposes to continue to implement procedural mitigation measures throughout the HSTT Study Area during training and testing activities that use sonar and other transducers that prescribe reducing the sound level or powering off sonar systems or transducers if marine mammals are sighted within the mitigation zones (see Chapter 5, Mitigation, for details).

The Navy balanced the need for the use of the area to meet training and testing requirements with the biological importance of the area for rough-toothed dolphin and other species. The Navy determined that establishing the following mitigation areas would likely reduce the number and level of impacts to this species and other species or stock, including false killer whales, humpback whales, Cuvier and Blainville's beaked whales, pygmy killer whales, dwarf sperm whales, melon-headed whales, short-finned pilot whales and other dolphin species occurring within the area without compromising military readiness:

Hawaii Island Mitigation Area – limits the amount of surface ship hull-mounted, mid-frequency active sonar (MF1) and dipping sonar (MF4) and restricts the use of explosives during testing, unit level training and major training exercises year-round (Figure K.2-2).

See Section K.2.2 (Mitigation Areas to be Implemented) for more details on the above mitigation area.

Navy vessels operate differently from commercial vessels in ways that are important to prevent whale collisions. As described in Section 2.3.3 (Standard Operating Procedures), surface ships operated by or for the Navy, have personnel assigned to stand watch at all times, day and night, when a ship or surfaced submarine is moving through the water (underway). Rough-toothed dolphins are known to be social like other dolphins and live in groups called pods. Typically, there can be from 10 to 20 members of a pod yet as many as 300 members have been observed in Hawaii. This species of dolphin has also been seen interacting with others including the bottlenose dolphins and spinner dolphins. These social interactions can make pods of rough-toothed dolphins more readily observable and less vulnerable to a vessel strike.

As discussed in Section 3.0.3.3.4.1 (Vessels and In-Water Devices), large Navy ships typically operate at average speeds of between 10 and 15 knots, which for reference is slower than large commercial vessels, such as container ships that steam at approximately 24 knots during normal operations (Maloni et al., 2013). Operating vessels at speeds that are not optimal for fuel conservation or mission requirements would be unsustainable due to increased time on station and increased fuel consumption. Each ship has a limited amount of time that it can be underway based on target service requirements and ship schedules. Ship schedules are driven largely by training cycles, scheduled maintenance periods, certification schedules, and deployment requirements. Because of the complex logistical considerations involved with maintaining ship schedules, the Navy does not have the flexibility to extend the amount of time that ships are underway during training and testing, which would result from vessel speed restriction mitigation. If the Navy were to incorporate vessel speed restrictions into event planning for approximately 3–6 months out of the year, ships would be unable to meet all of their requirements during their limited time available to be underway. This would hold true even if the restrictions only applied to transits to and from training or testing event locations and not during the events themselves. Therefore, it would not be practicable for the Navy to implement speed restrictions within the biologically important areas.

As described in Section 5.3.4.1 (Vessel Movement), additional vessel speed restrictions would prevent vessel operators from gaining handling proficiency, would prevent the Navy from properly testing vessel capabilities, and would increase required the time on station during training or testing events to build skill proficiency or properly test vessel capabilities (which would significantly increase fuel consumption); therefore, the proposed mitigation would have significant impacts on the Navy's ability to train and test, and would prevent the Navy from meeting its mission requirements.

The Navy's standard operating procedures discussed in Section 2.3.3 (Standard Operating Procedures) and ongoing mitigation measures described in Chapter 5 (Mitigation) are designed to avoid or reduce impacts to marine species and stocks throughout the Study Area. These measures would also limit the interaction between Navy vessels and odontocetes, further reducing the potential for vessel strikes in and outside of identified biologically important areas.

K.3.11 Hawaii Island Cuvier's Beaked Whale Small and Resident Population Area

An area covering approximately 23,590 km^2 of water space surrounding the Hawaii Island has been identified as a year-round biologically important area for a small and resident population of Cuvier's beaked whales *(Ziphius cavirostris)* within the Hawaii Range Complex portion of the HSTT Study Area (Baird et al., 2015a). The Cuvier's Beaked Whales Small and Resident Population Area is shown on Figure K.3-19. It is 70 km at its widest and wraps around the island of Hawaii in an irregular circle that reaches across the Alenuihaha Channel and into waters north of the Northeastern shore of Maui (Baird et al., 2015a). The water depth of the area ranges from 159 m to 5,569 m below sea level. As shown in Table K.1-1, and described in Section K.1.1.2, (Provisional 2015 Prohibited or Restricted Areas within HSTT Study Area), the Cuvier's Whale Small and Resident Population Area overlaps in part with HSTT Settlement Areas 1-A through 1-D.

The boundary of the area was delineated based on 581 satellite tag locations from nine individuals (two males, seven females) that were tagged in five different years, indicating high degrees of site fidelity to the identified area (Baird et al., 2015a).

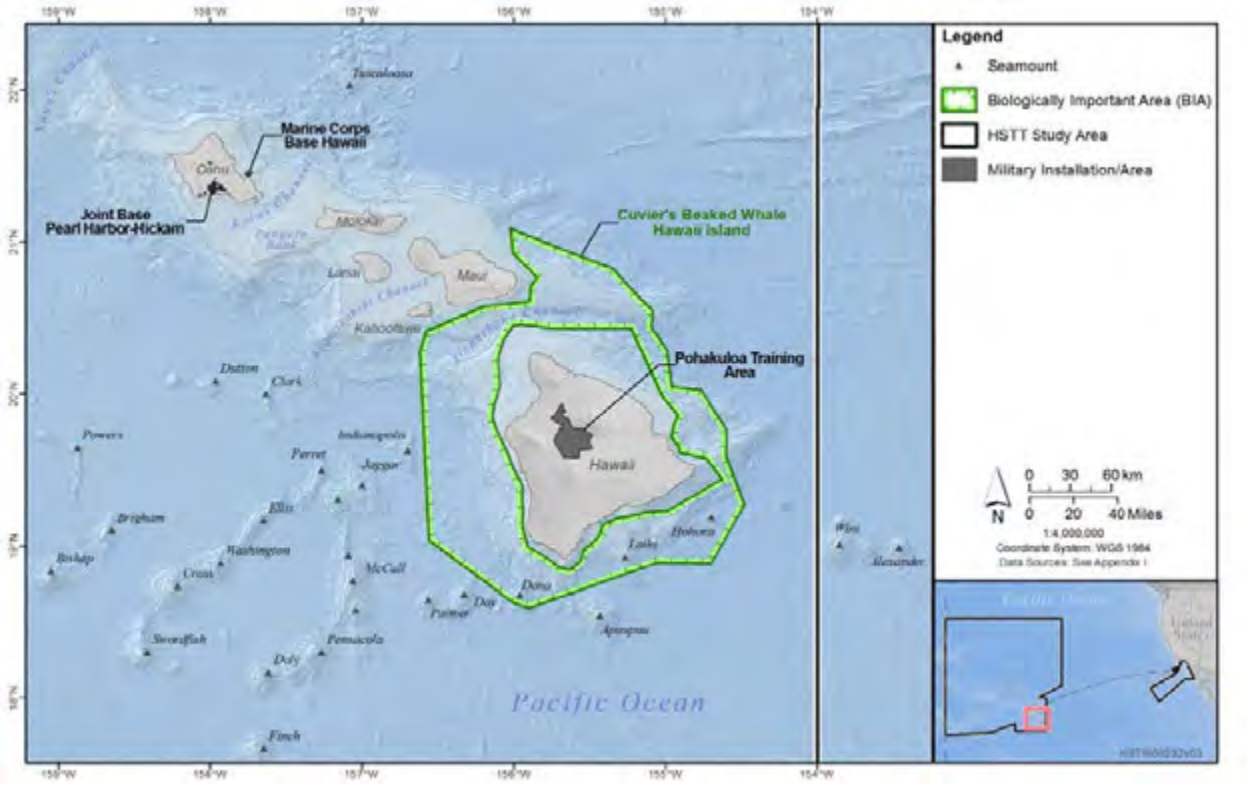


Figure K.3-19: Cuvier's Beaked Whale Small and Resident Population off Hawaii Island

K.3.11.1 General Biological Assessment

For a thorough description of the Cuvier's beaked whale species, see Section 3.7.2.3.24 (Cuvier's Beaked Whale [*Ziphius cavirostris*]) of the HSTT EIS/OEIS. NMFS recognizes one Hawaiian stock of Cuvier's beaked whales in Hawaii (Aschettino et al., 2012; Carretta et al., 2017).

K.3.11.1.1 Biological Considerations Applicable to the Cuvier's Beaked Whale Small and Resident Population Area

Cuvier's beaked whales are regularly found in waters surrounding the Hawaiian Islands (Baird et al., 2013b; Baird et al., 2015a; Barlow, 2006; Baumann-Pickering et al., 2010; Bradford et al., 2013; Lammers et al., 2015b; Mobley, 2004; Oleson et al., 2013; Oleson et al., 2015; Shallenberger, 1981). During the NMFS 2010 survey of the Hawaiian Islands Exclusive Economic Zone, there were 23 sightings of Cuvier's beaked whales, which were commonly seen nearshore in the Northwestern Hawaiian Islands (Bradford et al., 2013; Oleson et al., 2013; Oleson et al., 2015). In the main Hawaiian Islands, sightings have been reported off Niihau and Kauai, Lanai, Maui, and Hawaii Island (Baird et al., 2009a; Baird et al., 2013b; Baird et al., 2015a; Mobley, 2004; Oleson et al., 2013; Oleson et al., 2015; Shallenberger, 1981). In Hawaii, Cuvier's beaked whales have been occasionally observed breaching and this behavior, along with their large size and visible blows, likely increases their visual detectability (Baird, 2013).

Passive acoustic monitoring around the main Hawaiian Islands has also routinely recorded the presence of Cuvier's beaked whales (Baumann-Pickering et al., 2010; Lammers et al., 2015b). Cuvier's beaked whales were not detected in a relative brief (47-day) acoustic survey south of the Hawaiian Islands in the winter of 2014–2015 (Klinck et al., 2015), which is consistent with the suggested seasonal pattern of Cuvier's acoustic detections (Baumann-Pickering et al., 2014). Other data however, suggests Cuvier's

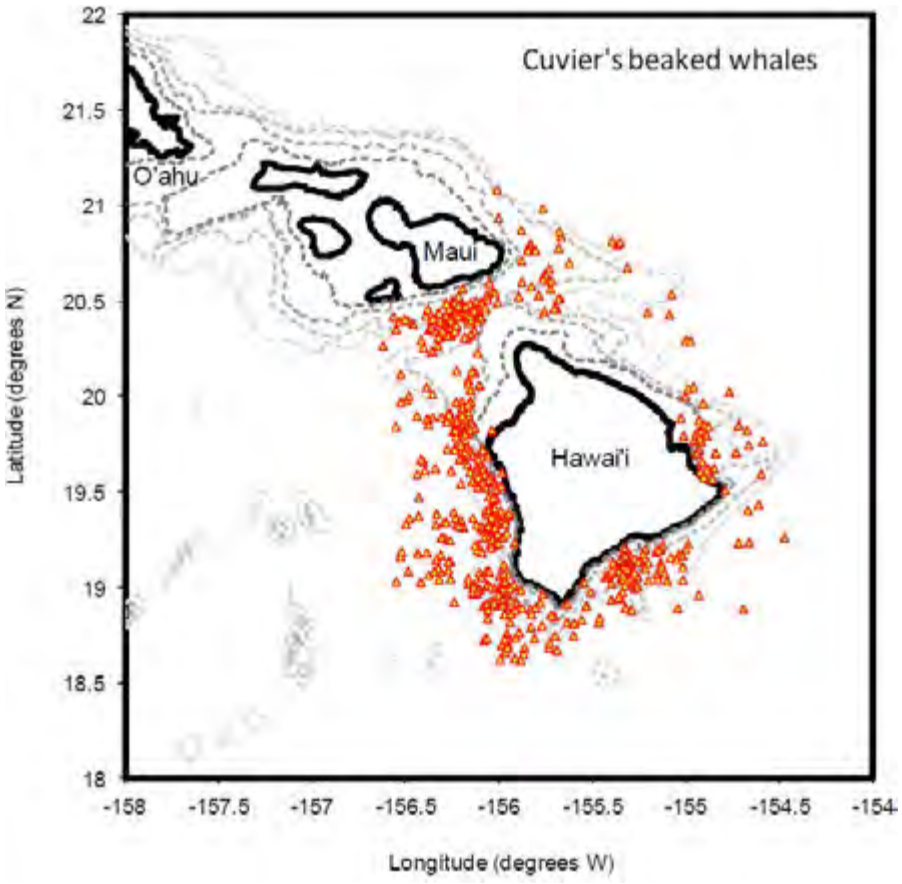
beaked whales use the area off Hawaii Island year-round rather than seasonally (McSweeney et al., 2007).

The U.S. Navy has been funding monitoring in the main Hawaiian Islands under the Pacific Fleet Marine Species Monitoring Program since 2006 (see www.marinespeciesmonitoring.us for detailed methodology and results). As detailed in the Section 3.7.3.1.2 (Impacts from Sonar and Other Transducers), individual animals could show short term and minor to moderate responses to these acoustic stressors, although these reactions are very unlikely to lead to any costs or long-term consequences for individuals or populations. Photographic identification of individuals encountered multiple times in the same general locations over periods of time exceeding two decades in some cases has indicated long-term residency by individual Cuvier's beaked whales in intensively used Navy training and testing areas in Hawaii (Baird et al., 2010a; Mahaffy et al., 2015b; McSweeney et al., 2007; Oleson et al., 2013) Schorr et al. (2008) and Southern California (Falcone et al., 2009; Schorr et al., 2014; Schorr et al., 2017). This documented long-term residency may suggest a lack of any long-term consequences from exposure to stressors associated with Navy training and testing activities, but could also be indicative of high-value resources that exceed the cost of remaining in the area. Long-term residency does not mean there has been no impact on population growth rates and there are no data existing on the reproductive rates of populations inhabiting the Navy range areas as opposed to beaked whales from other areas. In that regard however, recent results from photo-identifications are beginning to provide critically needed calving and weaning rate data for resident animals on the Navy's Southern California range. Three adult females that had been sighted with calves in previous years were again sighted in 2016, one of these was associated with her second calf, and a fourth female that was first identified in 2015 without a calf was sighted in 2016 with a calf (Schorr et al., 2017). Resident females documented with and without calves from year to year will provide the data for this population that can be applied to future research questions, but the present evidence for residence and reproductive success are indicative of a healthy population.

For the Hawaiian Islands, the currently available data precludes evaluation of population trends for Cuvier's beaked whales in the Hawaiian stock (Carretta et al., 2017). The current best available abundance estimate for the Hawaiian stock is 1,941, based on a 2010 shipboard line-transect survey of the Hawaiian Islands U.S. Exclusive Economic Zone (Bradford et al., 2017; Carretta et al., 2017). Mark-recapture analyses of photo-identified Cuvier's beaked whales off the west side of the island of Hawaii from 2003 to 2006 indicated a relatively small population estimated to consist of approximately 55 individuals (Baird et al., 2009b). Due to a relatively small survey effort in deep water, short tag attachment durations, and a lack of genetic analyses in areas of suitable habitat around the main Hawaiian Islands, there has been no genetic assessment Cuvier's beaked whales off the island of Hawaii to differentiate them as a genetically distinct populations (Baird et al., 2015a).

During surveys conducted from 1990 to 2006, photographic data documented 14 identified individuals that were seen in more than one year in an area to the west of Hawaii Island (McSweeney et al., 2007). This data indicated high site fidelity and residency by those animals. Satellite tracking locations of eight Cuvier's beaked whales tagged off Hawaii Island between 2008 and 2011 and part of this resident population (Baird, 2013; Oleson et al., 2013) are shown in Figure K.3-20 and demonstrate that while the majority of individuals spent most of their time off the west and southeast side of the island some of these eight members of the population ranged well offshore beyond the slope of the island of Hawaii, across the Alenuihaha Channel to the slope off Kahoolawe and Maui, and north of Maui well away from Hawaii Island.

Resightings of some individuals in the resident population have spanned at least 15 years, indicating long-term site fidelity to the area (Baird, 2013; Baird et al., 2010a; Baird et al., 2013b; Mahaffy et al., 2015b; McSweeney et al., 2007; Schorr et al., 2008). Based on the combination of available photo-identification data, vessel sightings and survey effort, and tagging data, the existence of a small and resident population of individual Cuvier's beaked whales was identified adjacent to the island of Hawaii (Baird et al., 2015a).



Source: Oleson et al. (2013)

Figure K.3-20: Satellite Tag Locations for Eight Cuvier's Beaked Whales Tagged off Hawaii Island Between 2008 and 2011.

Note: Although individuals' fidelity to these waters may be known from re-sights over successive years, the overall range of the NMFS recognized stock is considered to extend out to the Exclusive Economic Zone within Hawaiian waters.

Cuvier's beaked whales in Hawaii that are not part of the resident stock are likely to occasionally co-occur with the resident animals within the small and resident population area given the routine movement of Cuvier's beaked whales documented elsewhere (Schorr et al., 2014) and their general presence in waters surrounding the Hawaiian Islands (Baird, 2013; Baird et al., 2009b; Baird et al., 2015a; Barlow, 2006; Baumann-Pickering et al., 2010; Bradford et al., 2013; Lammers et al., 2015b; Mobley, 2004; Oleson et al., 2013; Shallenberger, 1981), the high sighting rate nearshore in the Northwestern Hawaiian Islands (Bradford et al., 2017), the sighting off Niihau and Kauai, Lanai, Maui, and Hawaii Island (Baird et al., 2009b; Baird et al., 2013c; Baird et al., 2015b; Mobley, 2004; Oleson et

al., 2013; Oleson et al., 2015; Shallenberger, 1981), and routine presence during passive acoustic monitoring (Baumann-Pickering et al., 2010; Lammers et al., 2015b). Based on some of this same data, it was previously proposed that NMFS recognize an Island-associated stock of Cuvier's beaked whales within the Hawaiian Archipelago out to 70 km from shore (Oleson et al., 2013).

K.3.11.1.2 Stressor Analysis

K.3.11.1.2.1 Sonar and Other Transducers

As detailed in Section 3.7.3.1.2 (Impacts from Sonar and Other Transducers), beaked whales exposed to sonar or other transducers may startle, break off feeding dives, and avoid the area of the sound source at levels ranging between 95 and 157 dB re 1 µPa (McCarthy et al., 2011). Cuvier's beaked whales commonly strand, and they are vulnerable to acoustic impacts (Cox et al., 2006; Frantzis et al., 2002; Southall et al., 2013). They have exhibited dive behavior in response to sonar. In 2014, the longest duration mammalian dive reported to date may have been in response to Naval sonar, or a normal dive, however the cause of the dive behavior is unknown (Schorr et al., 2014; Tyack et al., 2015). Quantitative acoustic analysis for the entire Hawaii population estimates that all exposures result in behavioral reactions or TTS and zero exposures resulting in PTS are anticipated.

Navy training and testing activities that use sonar and other transducers could occur year-round within the Hawaii Range Complex. The identified small and resident population areas only take up a very small portion of the Hawaii Range Complex; therefore, sonar use in this area would be infrequent and typically only last for a short duration. Most of the biologically important area is an area of low use for mid-frequency active sonar including the Alenuihaha Channel, which is used for vital strait transit training during Rim of the Pacific, Undersea Warfare training, and Independent Deployer Certification and which must be transited to access Kawaihae Harbor during amphibious landing events. Some significant behavioral reactions to sonar are likely within the identified area; however, sound sources at ranges greater than a few tens of kilometers are less likely to lead to significant reactions.

Research and observations show that beaked whales exposed to sonar or other active acoustic avoid the area of the sound source to levels between 95 and 157 dB re 1 µPa, (McCarthy et al., 2011). Furthermore, in research done at the Navy's instrumented tracking range in the Bahamas, animals have been observed to leave the immediate area of the anti-submarine warfare training exercise, but return within a few days after the event ends. The Navy has been operating for decades on the U.S. Navy test and evaluation range in the Bahamas and at the Pacific Missile Range Facility north of Kauai Where populations of beaked whales continue to inhabit those intensively used ranges and appear to be stable (Baumann-Pickering et al., 2014; Falcone et al., 2009; Henderson et al., 2015a; Henderson et al., 2015b; Henderson et al., 2016; Hildebrand et al., 2009; Manzano-Roth et al., 2013; Schorr et al., 2014; Tyack et al., 2011). Significant behavioral reactions seem likely in most cases if beaked whales are exposed to anti-submarine sonar within a few tens of kilometers, especially for prolonged periods (a few hours or more) since research indicates beaked whales have been shown to leave an area where anthropogenic sound is present (Tyack et al., 2011).

Photographic evidence indicating re-sightings of individual Cuvier's beaked whales suggests long-term site fidelity to the area west of the Island of Hawaii (McSweeney et al., 2007). This is an area that has been used for years to conduct anti-submarine warfare training during Rim of the Pacific and Under Sea Warfare Exercises (major training exercises involving multiple vessels and aircraft) (National Marine Fisheries Service, 2007; U.S. Department of the Navy, 2009). With the results from beaked whale monitoring and experimental exposure studies on the Navy's instrumented range in the Bahamas

(McCarthy et al., 2011; Tyack et al., 2011), there are now statistically strong data demonstrating that beaked whales tend to avoid both actual naval mid-frequency sonar in real anti-submarine warfare training scenarios as well as playbacks of killer whale vocalizations, and other anthropogenic sounds.

Tyack et al. (2011) report that, in reaction to sonar playbacks, most beaked whales stopped echolocation, made long slow ascent, and moved away from the sound. During an exercise using mid-frequency sonar, beaked whales avoided the area at a distance from the sonar where the received level was "around 140 dB" (sound pressure level) and once the exercise ended, beaked whales re-inhabited the center of exercise area within 2–3 days (Tyack et al., 2011). The Navy has therefore adopted a 140 dB re 1 µPa sound pressure level threshold for behavioral effects for all beaked whales. Since the development of the criterion, analysis of the data from the 2010 and 2011 field seasons of the Southern California Behavioral Responses Study have been published. The study, DeRuiter et al. (2013b), provides similar evidence of Cuvier's beaked whale sensitivities to sound based on two controlled exposures. Two whales, one in each season, were tagged and exposed to simulated mid-frequency active sonar at distances of 3.4–9.5 km. The 2011 Cuvier's beaked whale was also incidentally exposed to mid-frequency active sonar from a distant naval exercise (approximately 118 km away with received levels calculated as 84-144 and 78-106 dB re 1 µPa root mean square) respectively, but the authors did not detect similar responses indicating that context of the exposures (e.g., source proximity, controlled source ramp-up) may have been a significant factor (DeRuiter et al., 2013b).

In 2010, a passive acoustic monitoring glider was deployed off of the west coast of Hawaii Island for 10 days in March 2010. Cuvier's beaked whales were detected on three separate dives in the northern two-thirds of the survey area near the edge of the widest part of the shelf south of Kailua-Kona, which is in the small and resident population area (Klinck et al., 2016). A winter survey using a passive acoustic recording glider in the Hawaii Range Complex south of Oahu to the Cross Seamount from December 2014 to January 2015 found no passive acoustic detections of Cuvier's beaked whales in the area. They are also more commonly detected in the Hawaii Range Complex during the fall months (Klinck et al., 2015). The results of Navy surveys from 2010 to 2014 were used to estimate abundance of species in the region surrounding Niihau and Kaula Islands. They estimated that the population of Cuvier's beaked whales was 4 and appear to be rare in this part of the Hawaii Range Complex (Lammers et al., 2015b).

Although the Navy proposes to continue use of mid-frequency active sonar throughout the Hawaii Range Complex, it is likely to be used more frequently and with more short-duration intensity by surface ships off Pacific Missile Range near Kauai and further offshore from the Island of Hawaii. Based on the best available science, the Navy believes that beaked whales that exhibit a significant behavioral reaction due to sonar and other active acoustic training and testing activities would generally not have long-term consequences for individuals or populations as they return to areas shortly after sonar displacement.

The biologically important area for Cuvier's beaked whale overlaps with the Hawaii Range Complex and active sonar is proposed for use throughout the area. An animals' response to sonar in the biologically important area and the rest of the Hawaii Range Complex would be expected to be the same as the results of the 2010 survey example provided above, in which the individuals decreased dive behavior during sonar and moved away from the acoustic source then returned days after the exercise. Monitoring and research data, albeit with small sample sizes, suggests that individual Cuvier's beaked whales respond to U.S. Navy mid-frequency active sonar in such a way that would reduce their use of a geographic area temporarily, with individuals returning within 2 to 3 days.

K.3.11.1.2.2 Explosives

As indicated in Section 3.7.3.2.2 (Impacts from Explosives) the Navy does not generally train or test with explosives in the small and resident population area for Cuvier's beaked whales in the Hawaii Range Complex off the west coast and encircling Hawaii Island. Cuvier's beaked whales in the identified small and resident population area would not be exposed directly to sound or energy from explosives; therefore, impacts would not be anticipated within the Cuvier's beaked whale small and resident population areas from training or testing with explosives.

Most activities that involve underwater detonations and explosive munitions typically occur more than 3 NM from shore with the exception of underwater training ranges that are designated for explosive use. Historical data suggests that explosive events are most likely to be scheduled at Puuloa Underwater Range, W-188, or KAPU HOT south of Oahu in W-192 (Figure K.3-19) for ease of scheduling, safety, instrumentation, and airspace concerns. None of these ranges overlap with the Cuvier's beaked whale small and resident population area. Standard mitigation is implemented during explosives training and testing which includes use of lookouts and mitigation zones (sized based on activity) making it unlikely that an animal at the surface would be affected.

Cuvier's beaked whales may be exposed to sound or energy from explosions associated with training activities throughout the year; however, long-term consequences for individuals or the small and resident population would not be expected.

K.3.11.1.2.3 Vessel Strike

There have been two Cuvier's beaked whales documented in non-military vessel strikes (Aguilar, 2000; Van Waerebeek et al., 2007). However, evidence suggests that Cuvier's beaked whales may be able to hear the low-frequency sounds of large vessels and thus avoid collision (Ketten, 1998). There is no evidence to suggest that Navy vessels have ever struck a Cuvier's beaked whale.

K.3.11.1.3 Hawaii Island Cuvier's Beaked Whale Small and Resident Population Area, Settlement Areas 1-A through 1-D

K.3.11.1.4 Navy Requirements for Area-Specific Training and Testing

The Alenuihaha Channel, as well as the waters north and west of Hawaii Island, provides a unique training capability that does not exist elsewhere in the Hawaii Range Complex. The Alenuihaha Channel is an ideal location for strait transits using mid-frequency active sonar during training. The Alenuihaha Channel provides a vital and realistic analog for similar straits or restricted maneuvering areas where the Navy operates worldwide., For example, transit training in the Alenuihaha Channel replicates these types of strait environments that meet the Navy's requirement to deploy Naval forces to ensure the free flow of commerce and the freedom of navigation by combatting piracy or mine threats. Naval forces are required to train to counter a submarine threat before deployment to ensure such forces obtain the required proficiency to conduct anti-submarine warfare in a controlled and observed environment prior to deployment to international straits across the globe, where operational Commanders require Naval forces to be able to conduct a range of military operations, including anti-submarine warfare. This required proficiency cannot be replicated by simulation and is most effectively obtained when conducted in a strait. Commanding Officers cannot be expected to effectively conduct such operations in a deployed environment if the first time they encounter a submarine in a strait is in a deployed setting. Additionally, this channel provides a unique acoustic and tactical environment because there is a shallow trench running through part of the channel. There are few geographic areas that enable forces to do this type of training outside of the HSTT Study Area.

The ability of an aircraft carrier to defend itself from submarine attack with all available assets while conducting straits transits is critical to its survival in forward operating areas. The channel is located outside most of the civilian air traffic corridors approaching the Honolulu International Airport which is necessary to safely de-conflict with civilian air traffic.

The channel is located adjacent to waters approaching Kawaihae Harbor, the point of amphibious insertion for forces proceeding to the live-fire range at Pohakuloa Training Area. The Pohakuloa Training Area is the only range in the Hawaii Range Complex that supports ground force and aviation live-fire training. Training in this area allows for the integration of carrier strike group operations and amphibious landings. The Alenuihaha Channel allows sea, air, and land-based units to work in conjunction with one another in controlled airspace in close proximity to the Pohakuloa Training Area, the only range of its kind in Hawaii.

While there are other channels within the Hawaii Range Complex used for strait transit training and anti-submarine warfare training, none provide the important attributes of the Alenuihaha Channel. The Alenuihaha Channel's proximity to the Pohakuloa Training Area allows for realistic training and reduces time and fuel costs between these training areas. The channel between Niihau and Kauai is also acceptable from a training perspective, but this would add at least two days of transit during each Under Sea Warfare training exercise (time required to move through a different channel and reposition to operating areas near Pohakuloa Training Area). The Kaiwi Channel between Oahu and Molokai is also acceptable from some mid-frequency active sonar training perspective, but it is also a significant civilian air corridor, and raises safety concerns for anti-submarine warfare aircraft flying in that channel. In addition, the channel between Nihau and Kauai is proximate to the Pacific Missile Range Facility instrumented range) which would result in problems de-conflicting multiple activities and hazardous operations, raising safety concerns. For these reasons, Alenuihaha Channel is still the most suitable for anti-submarine warfare training during certain training scenarios.

The waters west of Hawaii Island and those approaching Kawaihae Harbor, support a wide spectrum of naval training. The waters just offshore from Kawaihae Harbor are without equal in the Hawaii Range Complex. The Hawaii Island Cuvier's Beaked Whale Small and Resident Population Area is adjacent to waters approaching Kawaihae Harbor, the point of amphibious insertion for forces proceeding to the live-fire range at Pohakuloa Training Area, which is the only live-fire range in the Hawaii Range Complex that supports ground force and aviation live-fire training. Training in this area allows for the integration of carrier strike group operations and amphibious landings, working in conjunction within a controlled airspace west of Hawaii Island for military training near the Pohakuloa Training Area.

Hawaii Island is unique in that it is provides the only capable air-to-ground range able of conducting carrier and expeditionary strike group activities near a channel with unfettered access to the open ocean. Open ocean areas support strike group maneuvering, using mid-frequency active sonar to prosecute (detect/track) a submarine in the vicinity of a high value unit (e.g., carrier) as aircraft execute strikes into Pohakuloa Training Area. The area around Hawaii Island is also used by surface ships with anti-submarine warfare capability to train for clearing the sea space of any submarine threat before Marines go ashore at Kawaihae Harbor (part of Rim of the Pacific and Marine Corps unit-level training scenarios). There are limited locations for amphibious landings in Hawaii due to existing environmental concerns. The west coast of Hawaii is one of the best locations for integrated joint marine amphibious operations because of its close proximity to the Pohakuloa Training Area.

As an air to ground range, Pohakuloa Training Area supports carrier strike group activities near a channel and near large open water areas for strike group maneuvering and submarine activities. Mid-frequency active sonar conducted to support strike maneuver and protecting high value unit (carrier) as aircraft go to strike at Pohakuloa Training Area is vital.

Access to both the Alenuihaha Channel and the waters west of Kawaihae Harbor must remain available for a broad spectrum of naval and amphibious training. These areas provide a unique and irreplaceable capability within the Hawaii Range Complex that allows naval forces to conduct realistic, integrated training in an environment that replicates the actual areas where they will be called to serve.

Activities utilizing in-water explosives, such as underwater detonations, bombing or torpedo exercises, are not conducted in the nearshore waters within the Cuvier's Beaked Whale Small and Resident Population Area since it is not within a designated underwater training range or within Special Use Airspace, typically necessary for in-water explosive usage.

K.3.11.1.5 Cuvier's Beaked Whale Small and Resident Population Area Mitigation Assessment

As demonstrated above, the sea and air space that encompasses the west side of Hawaii Island and the Alenuihaha Channel, including the Cuvier's Beaked Whale Small and Resident Population Area, provide high readiness value during Rim of the Pacific, Undersea Warfare certification training, Independent Deployer Certification training, and integrated amphibious warfare training. The designated Hawaii Island biologically important area covers over 5,000 NM^2 of water space surrounding Hawaii Island. Satellite tracking data (Baird et al., 2013b; Oleson et al., 2013) has confirmed that members of this resident population have ranged well beyond the island of Hawaii, across the Alenuihaha Channel to the slope off Kahoolawe and Maui, and north of Maui, which is consistent with data on the species from Southern California indicating long distance movements may be routine (Schorr et al., 2014).

In general, for the Hawaii Range Complex, pushing anti-submarine warfare training farther from land and out of the littorals would add transit time (increased fuel and loss of training time) in addition to providing an environment less likely to be expected in operating areas during deployment. Loss of the shallow to deep transition would eliminate up/downslope exploitation and bottom bounce investigations, for example. Water space outside of Hawaii OPAREA can be subject to seasonal extremes making large sea states, decreasing training value. Lastly, pushing training and testing further from land increases the difficulty in air control reporting and coordination required to conduct integrated readiness activities.

While the identified small and resident population area only takes up a small portion of the Hawaii Range Complex, a portion of this area is located within waters where the Navy typically conducts activities that involve sonar or other transducers during Undersea Warfare training, Independent Deployer Certification training, and Rim of the Pacific training. While Cuvier's beaked whale in Hawaii may be exposed to sound from sonar and other transducers used during training and testing activities throughout the year, the quantitative analysis estimates very few exposures resulting in behavioral reactions, TTS, or PTS due to exposure from sonar and other transducers throughout Hawaii Range Complex. Significant long-term impacts on Cuvier's beaked whale natural behaviors or abandonment/avoidance of habitat due to training and testing with sonar and other transducers are unlikely to occur within the small and resident population area.

Resightings of some individuals in the Hawaii Island resident population have spanned at least 15 years, indicating long-term site fidelity to the area. There are no indications that Navy training and testing has

had any of adverse impacts on populations of Cuvier's beaked whales in Hawaii or elsewhere in the HSTT Study Area. Predicted effects on individuals in the Hawaii Island Cuvier's beaked whale population are expected to be behavioral in response to the use of sonar and other transducers (see Appendix E, Estimated Marine Mammal and Sea Turtle Impacts from Exposure to Acoustic and Explosive Stressors Under Navy Training and Testing Activities).

The Navy balanced the need for the use of the area to meet training and testing requirements with the biological importance of the area for Cuvier's beaked whales. While significant long-term impacts on Cuvier's beaked whale behaviors or mortality are not anticipated from the use of sonar or explosives during Navy activities within the Study Area, the Navy determined that establishing the following mitigation area would likely reduce the number and level of impacts to this species and other species or stocks, including false killer whales, humpback whales, Blainville's beaked whales, pygmy killer whales, dwarf sperm whales, melon-headed whales, short-finned pilot whales, and dolphin species occurring within the area without compromising military readiness:

Hawaii Island Mitigation Area – limits the amount of surface ship hull mounted mid-frequency active sonar (MF1) and dipping sonar (MF4) and restricts the use of explosives during testing, unit level training and major training exercises year-round (Figure K.2-2).

See Section K.2.2 (Mitigation Areas to be Implemented) for more details on the above mitigation area.

As discussed in Section K.3.11.2.1 (Navy Requirements for Area-Specific Training and Testing), due to the strategic importance of the Alenuihaha Channel, the Navy cannot completely prohibit the use of surface ship hull-mounted mid-frequency active sonar or dipping sonar during training and testing; however, the Navy proposes to limit the amount of surface ship hull-mounted mid-frequency active sonar and dipping sonar used in the channel. The limited use of these sonar systems still allows naval forces to train in an environment that replicates strategic straits to which they will operate while likely reducing the number and level of impacts to Cuvier's beaked whales as well as for other marine mammal species or stocks including Blainville's beaked whales, occurring within the area without compromising military readiness.

Beaked whales, including Cuvier's beaked whales, are challenging to observe at sea due to their cryptic behavior, a low profile, long dive duration, and a small, inconspicuous blow at the water's surface making them barely visible to observers. While Navy vessels operate differently from commercial vessels in ways that are important to prevent whale collisions, observing beaked whales at the surface by personnel assigned to stand watch at all times, day and night, when a ship or surfaced submarine is moving through the water (underway), may be difficult - making beaked whales more vulnerable to vessel strikes than other large whale species. However, there have only been two reported non-Navy vessel strikes with beaked whales in the Study Area. Implementing the Navy's Marine Species Awareness Training, beginning in 2006, along with other existing Navy mitigation measures intended to ensure that vessels avoid whales, correlates well with the reduction of strikes on large whales by Navy vessels in the last decade.

The Navy's standard operating procedures discussed in Section 2.3.3 (Standard Operating Procedures). Ongoing mitigation measures described in Chapter 5 (Mitigation) are designed to avoid or reduce impacts to marine species and stocks throughout the Study Area. These measures would also limit the interaction between Navy vessels and beaked whales, further reducing the potential for vessel strikes in and outside of identified biologically important areas.

K.3.12 HAWAII ISLAND BLAINVILLE'S BEAKED WHALE SMALL AND RESIDENT POPULATION AREA

An area with a small and resident population of Blainville's beaked whales (*Mesoplodon densirostris*) off the coast of Hawaii Island has been identified as a year-round biologically important area (Baird et al., 2015a). The Hawaii Island Blainville's Beaked Whales Small and Resident Population Area is shown on Figure K.3-21 and is approximately 7,450 km^2. The water depth of the area ranges up to 4,816 m, with shallower water in the north and northwest portions of the area. This small and resident population area overlaps in part with HSTT Settlement Areas 1-A through 1-E, and 2-E discussed in Section K.1.1.2 (Provisional 2015 Prohibited or Restricted Areas within HSTT Study Area).

Population studies in Hawaii have demonstrated some evidence for residency (McSweeney et al., 2007). The boundary of the small and resident population area (Figure K.3-21) is based on a minimum convex polygon around 1,809 locations from 10 individuals (4 males, 6 females) satellite tagged from 2006 to 2011 (Baird et al., 2015a). This location of the area is based on photo-identification, vessel surveys, and tagging studies that show high site fidelity by a small sample size of individuals in the areas surveyed (Baird et al., 2015a).

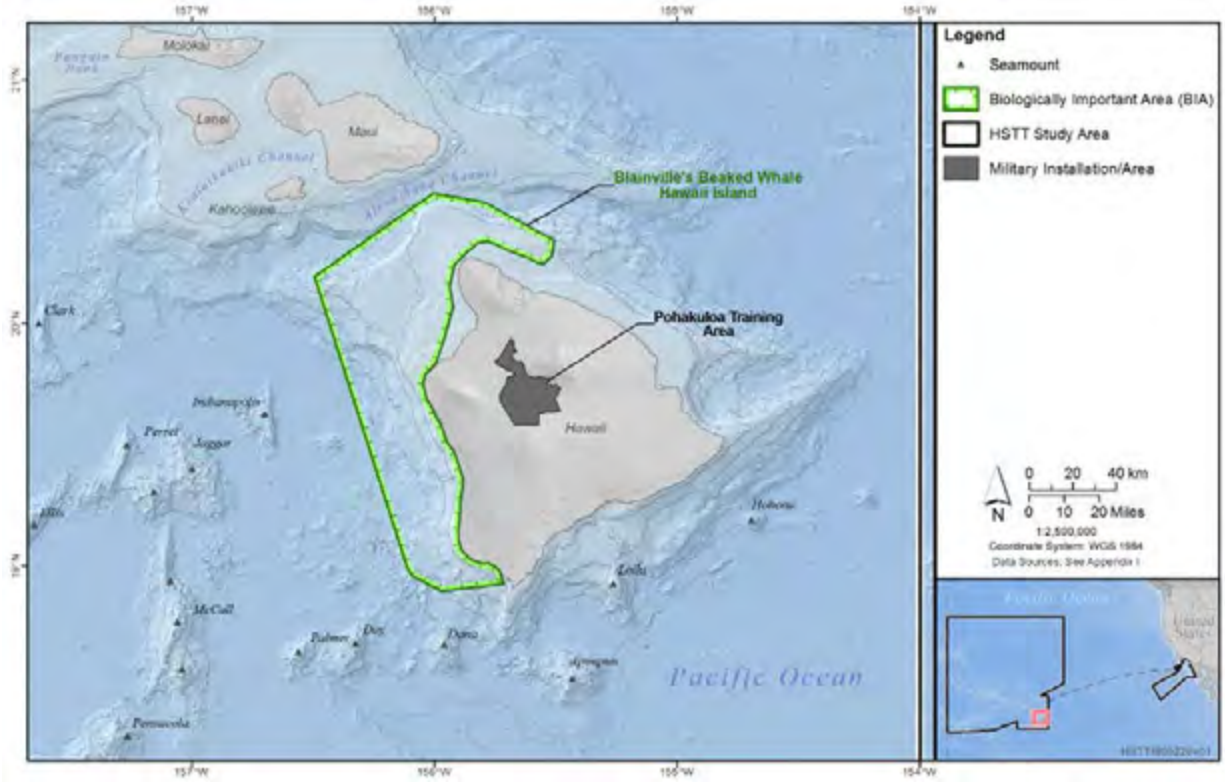


Figure K.3-21: Blainville's Beaked Whales Small and Resident Population off Hawaii Island

K.3.12.1.1 General Biological Assessment

For a thorough description of the Blainville's Beaked Whales species, see Section 3.7.2.3.26 (Blainville's Beaked Whale [*Mesoplodon densirostris*]).

The Blainville's beaked whale is protected under the MMPA and is not listed under the ESA. In Hawaii, NMFS recognizes one Hawaiian stock of Blainville's beaked whale (Carretta et al., 2017). Blainville's

beaked whales are one of the most widely distributed of the distinctive toothed whales within the *Mesoplodon* genus (Jefferson et al., 2008; MacLeod & D'Amico, 2006). Blainville's beaked whales are regularly found in Hawaiian waters (Baird et al., 2003; Baird et al., 2006; Barlow et al., 2004). The species is typically found elsewhere in areas where water depths exceed 3,280 ft. (1,000 m) along the continental slope (Barlow et al., 2006; Schorr et al., 2010).

K.3.12.1.2 Biological Considerations Applicable to the Blainville's Beaked Whale Small and Resident Population Area

Blainville's beaked whales are regularly found in Hawaiian waters both near shore and in the deep ocean portions of the Hawaiian Islands (Baird et al., 2003; Baird et al., 2004; Baird et al., 2005; Baird et al., 2006; Baird et al., 2009b; Baird et al., 2010a; Baird et al., 2011b; Barlow et al., 2004; Barlow, 2006; Bradford et al., 2017; Henderson et al., 2016; Klinck et al., 2016; Manzano-Roth et al., 2016; McSweeney et al., 2007; Schorr et al., 2010). Blainville's beaked whales have been detected off Oahu for prolonged periods annually and have been consistently observed with high site fidelity off the west coast of the Island of Hawaii (McSweeney et al., 2007). Blainville's beaked whale vocalizations have also been routinely detected in acoustic monitoring in the Hawaiian Islands (Henderson et al., 2015a; Henderson et al., 2016; Lammers et al., 2015b; Manzano-Roth et al., 2016; Manzano-Roth et al., 2013; Rankin & Barlow, 2007) including during an acoustic monitoring glider survey that began approximately 120 km south of Oahu navigating a triangular track through deep ocean waters that intermittently crossed over or near seamounts as well as relatively featureless areas in between (Klinck et al., 2016). During the glider survey, sounds from Blainville's beaked whales were detected in open ocean areas and at Brigham Seamount, but not at any of the other seamounts sampled along the glider's route.

Blainville's beaked whales are the dominant beaked whale species that is acoustically detected on the Pacific Missile Range Facility. The results of Navy surveys from 2010 to 2014 were used to estimate the abundance of species in the region surrounding Niihau and Kaula Islands. They found that the population of Blainville's beaked whales there was 12 and that they appear to be rare in this part of the Hawaii Range Complex (Lammers et al., 2015b).

During six training events at the Pacific Missile Range Facility in 2011, 2012, and 2013, monitoring data from passive acoustic measurement devices showed that dives decreased when mid-frequency active sonar was in use by 50 percent or more on occasions in 2012 and 2013, and detections of Blainville's beaked whales increased after mid-frequency active sonar events, but remained lower than they were before mid-frequency active sonar events occurred (Henderson et al., 2015b; Henderson et al., 2016; Manzano-Roth et al., 2016). Most dives that were recorded when mid-frequency active sonar was in use were measured on the edges or off the Pacific Missile Range Facility indicating that Blainville's beaked whales may move away from the sonar source when it is active (Henderson et al., 2015b; Martin et al., 2016b).

A satellite tracking study of a Blainville's beaked whales off the island of Hawaii generally found the movements of those whales to be restricted to the waters of the west and northwest side of the island (Baird et al., 2010a; Mahaffy et al., 2015b; Schorr et al., 2010). There were, however, exceptions as shown in Figure K.3-22, which documented a range overlap of resident Blainville's beaked whales with wider ranging individuals and also documented the large distance that may be reflective of routine movements by some Blainville's beaked whales in Hawaii (Baird, 2011). Subsequently, the tagged animal moved a cumulative distance of 1,801 km and traveled 1,008 km from the site of tagging over a 40-day period.

The tracked locations of Blainville's beaked whales documented by satellite tag data as shown in the two figures, seem to indicate routine long-distance movements over relatively short periods of time. If this is the case, then there are substantial implications for what should be considered a significant alteration of behavior and for how meaningful it is to an individual if they leave an area temporarily to avoid sound sources such as sonar or to avoid other anthropogenic activity.

In 2010 a passive acoustic monitoring glider was deployed off of the Kona (west) Coast of the Island of Hawaii for 10 days in March. Blainville's beaked whales were detected on four separate dives in the southern parts of the survey area near the edge of the widest part of the shelf south of Kailua-Kona, which is in the identified small and resident population area (Klinck et al., 2016). From 2011 to 2014 two Blainville's beaked whales were tagged from one population off of Kauai, however, only one of the tags functioned and no dive data was collected. That individual, in February of 2014, spent approximately 20.5 percent of the eight-day period it was tracked in the Pacific Missile Range Facility before swimming south to an area around Kaula Island southwest of Niihau (Figure K.3-23) (Baird et al., 2015b; Moretti & Baird, 2015).

For the Hawaiian Islands, the currently available data precludes evaluation of population trends for Blainville's beaked whales in the Hawaiian stock, which is estimated to consist of 2,872 individuals (Carretta et al., 2017). Surveys conducted from 1986 to 2006 identified a total of 59 individuals, 20 of which were seen more than once with re-sightings of some individuals spanned 17 years, therefore documenting long-term site fidelity to the area by those individuals (Baird, 2013; Mahaffy et al., 2015b; McSweeney et al., 2007). The number of Blainville's beaked whales in the small and resident population west of Hawaii using photographic data in a mark-recapture analysis estimated 140 individuals (CV = 0.30) using the area off the island of Hawaii over a 4-year period (Baird et al., 2009b). The area with a small number of individuals demonstrating long-term high site fidelity based on photo-identification, vessel-based survey, and tagging studies was recognized as an important area for that small and resident population (Baird et al., 2015a).

Although individuals' fidelity to these waters may be known from re-sights over successive years, the overall range of the small and resident population as it extends beyond this area is unknown. Due to a relatively small survey effort in areas of suitable habitat elsewhere around the main Hawaiian Islands, it is unknown whether additional areas or resident populations exist. No genetic assessment to differentiate Blainville's beaked whales off the island of Hawaii from other areas has been conducted due to insufficient genetic sample sizes (Baird et al., 2015a).

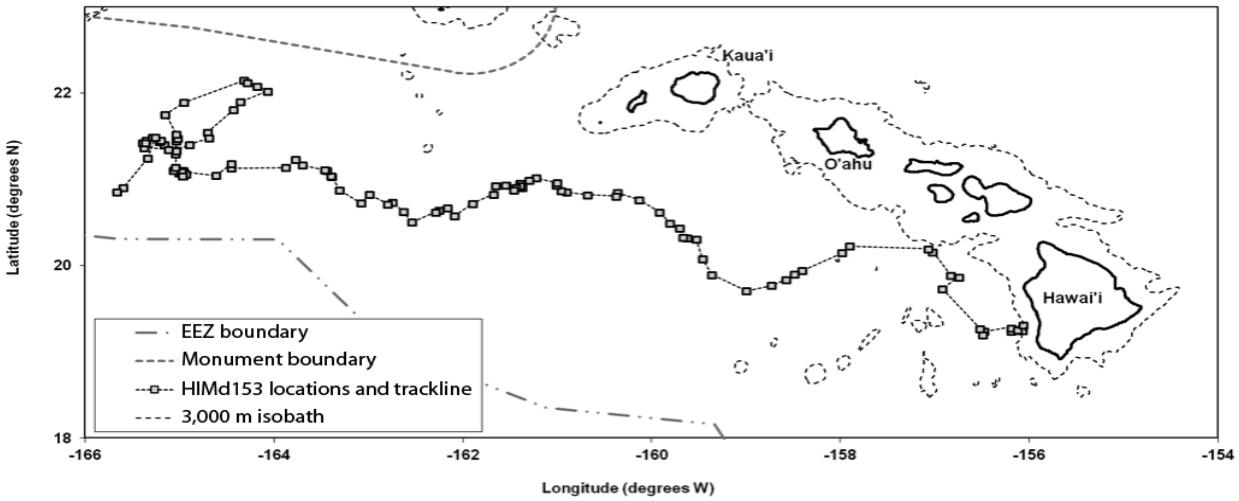
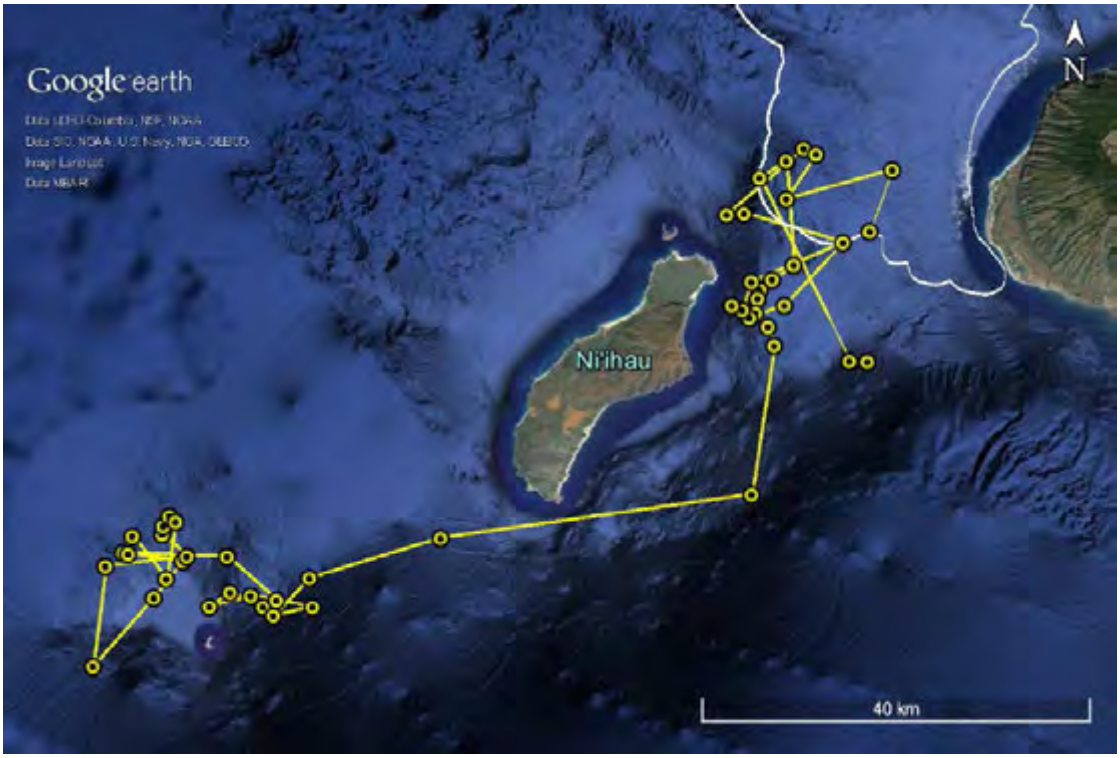


Figure K.3-22: Satellite Track of a Blainville's Beaked Whale (tag HIMd 153) Tagged in 2009 in the Resident Population Area West of Hawaii Island



Source: (Baird et al., 2015b)

Figure K.3-23: Satellite Tagged Blainville's Beaked Whale Locations from February 2014 Over an Eight-Day Period

K.3.12.1.3 Stressor Analysis

K.3.12.1.3.1 Sonar and Other Transducers

As detailed in Section 3.7.3.1.2 (Impacts from Sonar and Other Transducers), beaked whales exposed to sonar or other transducers may startle, break off feeding dives, and avoid the area of the sound source at levels ranging between 95 and 157 dB re 1 µPa (McCarthy et al., 2011). Blainville's beaked whales have been shown to react to anthropogenic noise by avoidance (Tyack et al., 2011). In response to a simulated sonar signal and pseudorandom noise (a signal of pulsed sounds that are generated in a random pattern), a tagged whale ceased foraging at depth and slowly moved away from the source while gradually ascending toward the surface (Tyack et al., 2011). Quantitative acoustic analysis for the entire Hawaii population of beaked whales estimates that all exposures result in behavioral reactions or TTS, and zero exposures resulting in PTS are anticipated.

The U.S. Navy has been funding monitoring in the main Hawaiian Islands under the U.S. Pacific Fleet Marine Species Monitoring Program since the mid-2000s (see www.marinespeciesmonitoring.us for detailed methodology and results). Since 2012, monitoring in the Hawaii Range Complex has occurred primarily off Kauai in order to utilize the instrumented hydrophone range at the Pacific Missile Range Facility for passive acoustic monitoring and analysis of marine mammal exposure and response to Navy training and testing. The Pacific Missile Range Facility is used for a variety of training and testing activities, including anti-submarine warfare training, which requires use of hull-mounted mid-frequency active sonar. Since 2007, several days of marine mammal acoustic data have been obtained and archived from the Pacific Missile Range Facility hydrophones each month for future analysis. Submarine Command Course occurs on the range twice a year and utilizes mid-frequency active sonar so it was chosen by U.S. Pacific Fleet as the focal training event for monitoring. Beginning in 2011, additional (classified) data have been archived from Submarine Command Course for post-exercise analysis of marine mammal exposure and response (Henderson et al., 2016; Manzano-Roth et al., 2016).

As discussed in Section 3.7.3.1 (Acoustic Stressors), sound sources at ranges greater than a few tens of kilometers are less likely to lead to significant reactions. Therefore, some impacts on Blainville's beaked whale natural behaviors could occur within the small and resident population area due to training with sonar and other transducers. Abandonment of the identified area is not expected to occur because the Navy has been training and testing in this area with sonar for decades and 17 years of data indicates long-term site fidelity to the area by some individuals (Baird, 2013; Mahaffy et al., 2015b; McSweeney et al., 2007).

Tyack et al. (2011) reported that, in reaction to sonar playbacks, most beaked whales stopped echolocation, made long slow ascent, and moved away from the sound. During an exercise using mid-frequency sonar, beaked whales avoided the area at a distance from the sonar where the received level was "around 140 dB" (sound pressure level) and once the exercise ended, beaked whales re-inhabited the center of exercise area within 2–3 days (Tyack et al., 2011). The Navy has therefore adopted a 140 dB re 1 µPa sound pressure level threshold for behavioral effects for all beaked whales. Findings from the Bahamas are consistent with those from Kauai where Blainville's beaked whales tended to move away from the sonar source (Henderson et al., 2015b; Martin et al., 2016b). Surveys suggest that Blainville's beaked whales move to the southern portion of the Pacific Missile Range Facility during the months of February and August when large-scale training exercises (e.g., Submarine Command Course) are more often scheduled to occur (Henderson et al., 2015a; Henderson et al., 2015b; Henderson et al., 2016). During the remaining months their dives can be detected more broadly throughout the Pacific Missile Range Facility, even during small-scale training events using mid-frequency active sonar.

Henderson et al. (2015a) suggest that populations of beaked whales may habituate to sonar, explosive, and other acoustic activity if they are resident to the range areas, as Blainville's beaked whales return to the Pacific Missile Range Facility even with regular use of the range for acoustic and explosive activities (Henderson et al., 2015b; Martin et al., 2016b).

K.3.12.1.3.2 Explosives

As indicated in Section 3.7.3.2.2 (Impacts from Explosives), most activities that involve underwater detonations and explosive munitions typically occur more than 3 NM from shore with the exception of underwater training ranges that are designated for explosive use. Historical data suggest that explosive events are most likely to be scheduled at Puuloa Underwater Training Range, W-188, or KAPU HOT south of Oahu in W-192 for ease of scheduling, safety, instrumentation, and airspace concerns. None of these areas are within the small and resident population area for Blainville's beaked whales off the west coast of Hawaii Island. Therefore, Blainville's beaked whales in the identified small and resident population area would not be exposed directly to sound or energy from explosives; therefore, impacts would not be anticipated within the area from training or testing with explosives.

K.3.12.1.3.3 Vessel Strike

There have been several species of Mesoplodon (toothed whales) documented in non-military vessel strikes, however none have specifically been identified as Blainville's beaked whales (Van Waerebeek et al., 2007). Beaked whales are challenging to observe at sea due to their cryptic behavior, a low profile, and a small, inconspicuous blow at the water's surface making them barely visible to observers. However, evidence suggests that Blainville's beaked whales may be able to hear the low-frequency sounds of large vessels and thus avoid collision (Ketten, 1998). There is no evidence to suggest that Navy vessels have ever struck a Blainville's beaked whale. It is therefore reasonable to assume that vessel strikes to Blainville's beaked whales are very unlikely to occur.

K.3.12.1.4 Hawaii Island Blainville's Beaked Whale Small and Resident Population Area, Settlement Areas 1-A through 1-E, and 2-E

K.3.12.1.5 Navy Requirements for Area-Specific Training and Testing

The Alenuihaha Channel, as well as the waters north and west of Hawaii Island, provides a unique training capability that does not exist elsewhere in the Hawaii Range Complex. The Alenuihaha Channel is an ideal location for strait transits using mid-frequency active sonar during training. The Alenuihaha Channel is an actual channel that provides a vital and realistic analog for similar straits or restricted maneuvering areas where the Navy operates worldwide, such as the East or South China seas. For example, transit training in the Alenuihaha Channel replicates these types of strait environments that meet the Navy's requirement to deploy Naval forces to ensure the free flow of commerce and the freedom of navigation by combatting piracy or mine threats. Naval forces are required to train to counter a submarine threat before deployment – to ensure the first time a surface asset conducts anti-submarine warfare training in a strait prior to being deployed to the Straits of Hormuz or Malacca or similar areas. Additionally, this channel provides a unique acoustic and tactical environment because there is a shallow trench running through part of the channel. There are few geographic areas that enable forces to do this type of training outside of the HSTT Study Area.

The ability of an aircraft carrier to defend itself from submarine attack with all available assets while conducting straits transits is critical to its survival in forward operating areas. The channel is located outside most of the civilian air traffic corridors approaching the Honolulu International Airport which is necessary to safely de-conflict with civilian air traffic.

It is located adjacent to waters approaching Kawaihae Harbor, the point of amphibious insertion for forces proceeding to the live-fire range at Pohakuloa Training Area. The Pohakuloa Training Area is the only range in the Hawaii Range Complex that supports ground force and aviation live-fire training. Training in this area allows for the integration of carrier strike group operations and amphibious landings. The Alenuihaha Channel allows sea, air, and land-based units to work in conjunction with one another in controlled airspace in close proximity to the Pohakuloa Training Area, the only range of its kind in Hawaii.

While there are other channels within the Hawaii Range Complex used for strait transit training and anti-submarine warfare training, none provide the important attributes of the Alenuihaha Channel. The Alenuihaha Channel's proximity to the Pohakuloa Training Area allows for realistic training and reduces time and fuel costs between these training areas. The channel between Niihau and Kauai is also acceptable from a training perspective, but this would add at least two days of transit during each Under Sea Warfare training exercise (time required to move through a different channel and reposition to operating areas near Pohakuloa Training Area). The Kaiwi Channel between Oahu and Molokai is also acceptable from some mid-frequency active sonar training perspective, but it is also a significant civilian air corridor, and raises safety concerns for anti-submarine warfare aircraft flying in that channel. In addition, the channel between Nihau and Kauai is proximate to the Pacific Missile Range Facility instrumented range) which would result in problems de-conflicting multiple activities and hazardous operations, raising safety concerns. For these reasons, Alenuihaha Channel is still the most suitable for anti-submarine warfare training during certain training scenarios.

The Blainville's Beaked Whale Small and Resident Population Area incorporates the offshore approach into Kawaihae Harbor on the northwest coast of Hawaii Island. This small and resident population area west of Hawaii Island is overlapped by W-194 and Pele and Pele South Air Traffic Control Assigned Airspace which are necessary for carrier and expeditionary strike training into the Pohakuloa Training Area range.

Hawaii Island is unique in that it is provides the only capable air-to-ground range able of conducting carrier and expeditionary strike group activities near a channel with unfettered access to the open ocean. Open ocean areas support strike group maneuvering, using mid-frequency active sonar to prosecute (detect/track) a submarine in the vicinity of a high value unit (e.g., carrier) as aircraft execute strikes into Pohakuloa Training Area. The area around Hawaii Island is also used by surface ships with anti-submarine warfare capability to train for clearing the sea space of any submarine threat before Marines go ashore at Kawaihae Harbor (part of Rim of the Pacific and Marine Corps unit-level training scenarios). There are limited locations for amphibious landings in Hawaii due to existing environmental concerns. The west coast of Hawaii is one of the best locations for integrated joint marine amphibious operations because of its close proximity to the Pohakuloa Training Area.

Controlled airspace areas on the west side of Hawaii Island are important safe areas in which military aircraft operations are de-conflicted with civilian air traffic. The Navy uses W-194 and the Pele and Pele South Air Traffic Control Assigned Airspace for Rim of the Pacific (every other year) and Undersea Warfare certification training (up to three times/year), and possibly the Independent Deployer Certification training (once every year). The controlled airspace combined with access to the Pohakuloa Training Area range drives Undersea Warfare certification training to that particular location, by supporting the required extensive coordination with multiple air and sea assets.

Activities utilizing in-water explosives, such as underwater detonations, bombing or torpedo exercises, are not conducted in the nearshore waters within the Blainville's Beaked Whale Small and Resident Population Area since it is not within a designated underwater training range or within Special Use Airspace, typically necessary for in-water explosive usage.

K.3.12.2 Blainville's Beaked Whale Small and Resident Population Area Mitigation Assessment

In general, for the Hawaii Range Complex, pushing anti-submarine warfare training further from land and out of the littorals would add transit time (lost fuel and training time) in addition to providing an environment less likely to be expected in operating areas during deployment. Loss of the shallow to deep water transition would eliminate up/downslope exploitation and bottom bounce investigations for example. Water space outside of Hawaii OPAREA can be subject to seasonal extremes making large sea states, decreasing training value. Lastly, pushing operations further from land increases the difficulty in air control reporting and coordination required to conduct integrated readiness activities.

While the identified small and resident population area only takes up a small portion of the Hawaii Range Complex and is located within waters where the Navy occasionally conducts activities that involve mid-frequency active acoustic sonar during Undersea Warfare training, Independent Deployer Certification training, and Rim of the Pacific training, Blainville's beaked whale in Hawaii may be exposed to sound during training and testing activities throughout the year. The quantitative analysis estimates very few exposures resulting in behavioral reactions and TTS; no PTS are anticipated due to exposure from sonar and other transducers for all beaked whale species across the entire Hawaii Range Complex. Predicted effects on individuals in the Hawaii Island Blainville's beaked whale population are expected to be behavioral in response to the use of sonar and other transducers (see Appendix E, Estimated Marine Mammal and Sea Turtle Impacts from Exposure to Acoustic and Explosive Stressors Under Navy Training and Testing Activities).

Passive acoustic records have indicated a reduction in Blainville's beaked whale sound production around the locus of mid-frequency active sonar use during training, which has been assumed reflected an avoidance of the area in the vicinity of the sonar (Henderson et al., 2015a; Martin et al., 2016a). Satellite tag location data has, however, suggested broad movements by Blainville's beaked whales (in excess of 1,000 km) may be routine and in one case included movements over an 8-month period onto a range where active sonar use was ongoing (Baird, 2011; Baird et al., 2015b; Moretti & Baird, 2015). In short, there have been no demonstrated adverse impacts to any population of Blainville's beaked whales as a result of Navy training.

The designated Hawaii Island biologically important area covers over 1,600 NM^2 of water space along the western coast of Hawaii Island and part of the Alenuihaha Channel. Satellite tracking data (Baird et al., 2013c; Oleson et al., 2013) has demonstrated that members of this resident population have ranged well beyond the island of Hawaii (in excess of 1,000 km) which may be reflective of routine movements by some Blainville's beaked whales in Hawaii (Baird, 2011).

Significant long-term impacts on Blainville's beaked whale behaviors or mortality are not anticipated from the use of sonar or explosives during Navy activities within the Study Area; however, the Navy balanced the need for the use of the area to meet training and testing requirements with the biological importance of the area for Blainville's beaked whales and other species. The Navy determined that establishing the following mitigation area would likely reduce the number and level of impacts to this species and other species or stock, including false killer whales, humpback whales, Cuvier's beaked

whales, pygmy killer whales, dwarf sperm whales, melon-headed whales, short-finned pilot whales and dolphin species occurring within the area without compromising military readiness.

Hawaii Island Mitigation Area – limits the amount of surface ship hull mounted mid-frequency active sonar (MF1) and dipping sonar (MF4) and restricts the use of explosives during testing, unit level training and major training exercises year-round (Figure K.2-2).

See Section K.2.2 (Mitigation Areas to be Implemented) for more details on the above mitigation area.

As discussed in Section K.3.12.2.1 (Navy Requirements for Area-Specific Training and Testing), due to the strategic importance of the Alenuihaha Channel, the Navy cannot completely prohibit the use of surface ship hull-mounted mid-frequency active sonar or dipping sonar during training and testing; however, the Navy proposes to limit the amount of surface ship hull-mounted mid-frequency active sonar and dipping sonar used in the channel. The limited use of these sonar systems still allows naval forces to train in an environment that replicates strategic straits in which they will operate while likely reducing the number and level of impacts to Blainville's beaked whales as well as for other marine mammal species or stocks occurring within the area without compromising military readiness.

Beaked whales, including Blainville's beaked whales, are challenging to observe at sea due to their cryptic behavior, a low profile, and a small, inconspicuous blow at the water's surface making them barely visible to observers. While Navy vessels operate differently from commercial vessels in ways that are important to prevent whale collisions, observing beaked whales at the surface by personnel assigned to stand watch at all times, day and night, when a ship or surfaced submarine is moving through the water (underway), may be difficult–making beaked whales more vulnerable to vessel strikes than other large whales. Implementing the Navy's Marine Species Awareness Training, beginning in 2006, along with other existing Navy mitigation measures intended to ensure that vessels avoid whales, correlates well with the reduction of strikes on large whales by Navy vessels in the last decade.

Mitigation measures described in Chapter 5 (Mitigation) are designed to avoid or reduce impacts to marine species and stocks throughout the Study Area. These measures would also limit the interaction between Navy vessels and beaked whales, further reducing the potential for vessel strikes in and outside of identified biologically important areas.

K.4 Biologically Important Areas within the Southern California Portion of the HSTT Study Area

K.4.1 Blue Whale Feeding Areas

Blue whale feeding areas were developed by encompassing the locations of blue whales observed feeding between 1986 and 2011 during small boat surveys (Calambokidis et al., 2015) (Figure K.4-1). The area of overlap with the HSTT Study Area covers approximately 2,325 km^2 of water space. As shown in Table K.1-1 and described in Section K.1.1.2, (Provisional 2015 Prohibited or Restricted Areas within HSTT Study Area), these identified blue whale feeding areas overlap with HSTT Settlement Areas 3-A through 3-C, 4-A, and 4-C (Figure K.4-1). In addition, some of the Blue Whale Feeding Areas overlap with agreement areas identified during coastal zone Federal consistency review by the California Coastal Commission, as discussed in Section K.1.1.3 (Areas Identified by the California Coastal Commission).

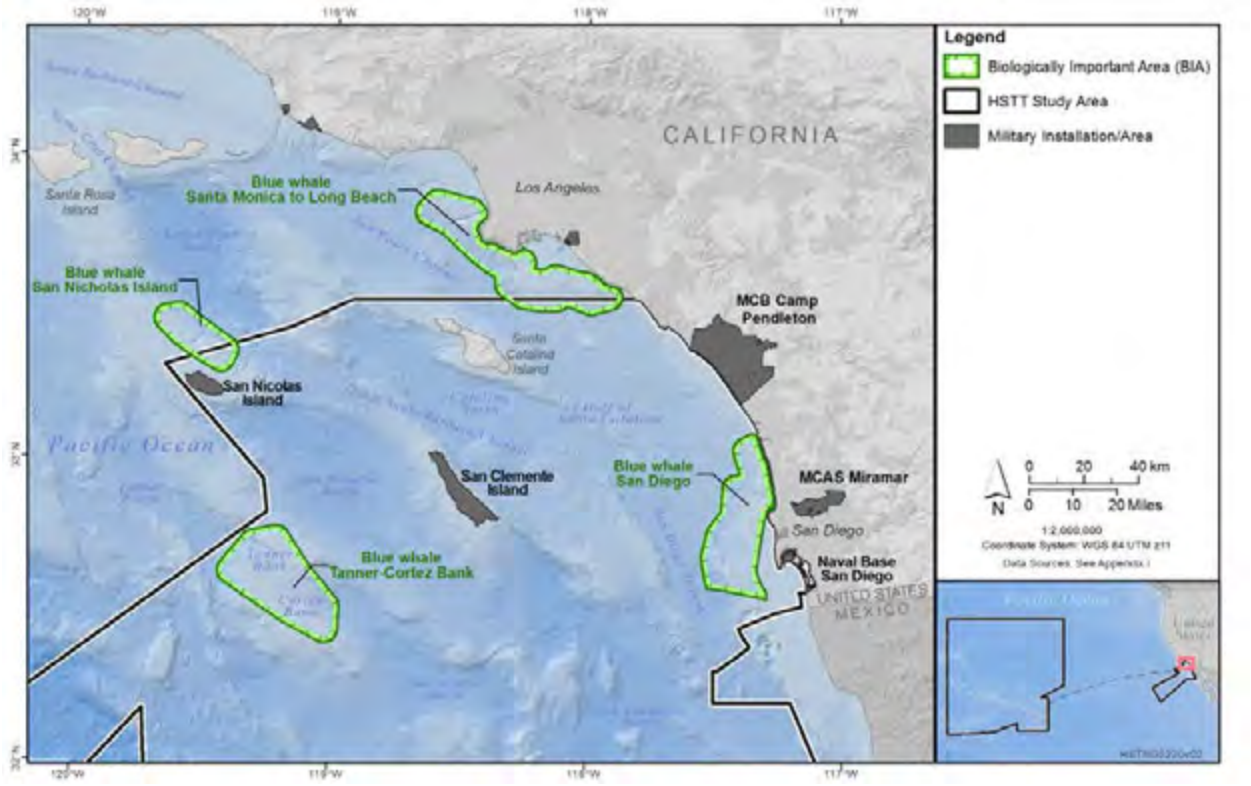


Figure K.4-1: Blue Whale Feeding Areas off the Southern California Coast

K.4.1.1 General Biological Assessment

For a thorough description of the blue whale species, see Section 3.7.2.2.2, (Blue Whale [*Balaenoptera musculus]*).

Since 2009, researchers have observed a northward shift in blue whale distribution (Barlow, 2010; Calambokidis et al., 2009a; Calambokidis & Barlow, 2013; Carretta et al., 2017; Širović et al., 2015). Irvine et al (2014) deployed satellite tags on 171 blue whales off California between 1993 and 2008. The tagged whales ranged as far north as Alaska and far south as the tip of the Baja Peninsula, Mexico. The blue whale home range and core area in Southern California, as defined by Irvine et al (2014) from tagging data, are centered to the north of San Miguel and Santa Cruz islands, which is far to the north of the HSTT Study Area. Irvine et al. (2014) calculated the relative amount of time blue whales spent in specific areas and adjusted the data to account for unequal satellite track durations between individual tagged blue whales. Previous data suggesting the use of certain feeding areas by blue whales should be considered in context with more recent data indicating a general shift to the north, outside of the HSTT Study Area. The northward shift in blue whale feeding locations is likely driven by a northward shift in the availability of prey (Barlow, 2010; Calambokidis et al., 2009a; Calambokidis & Barlow, 2013; Carretta et al., 2017, 2018; Širović et al., 2015).

Blue whales are known to return seasonally to the same general areas where they have previously foraged, and also opportunistically feed on concentrations of krill or other prey. Specific locations where prey are concentrated can vary seasonally and inter-annually, and are driven by dynamic ocean conditions (e.g., shifts in large-scale current systems like the California Current) and ocean-atmosphere interactions (e.g., the El Nino Southern Oscillation cycle) that can affect much of the North Pacific basin, as well as small-scale dynamics, driven by short-term events like isolated storms and upwelling. Recently

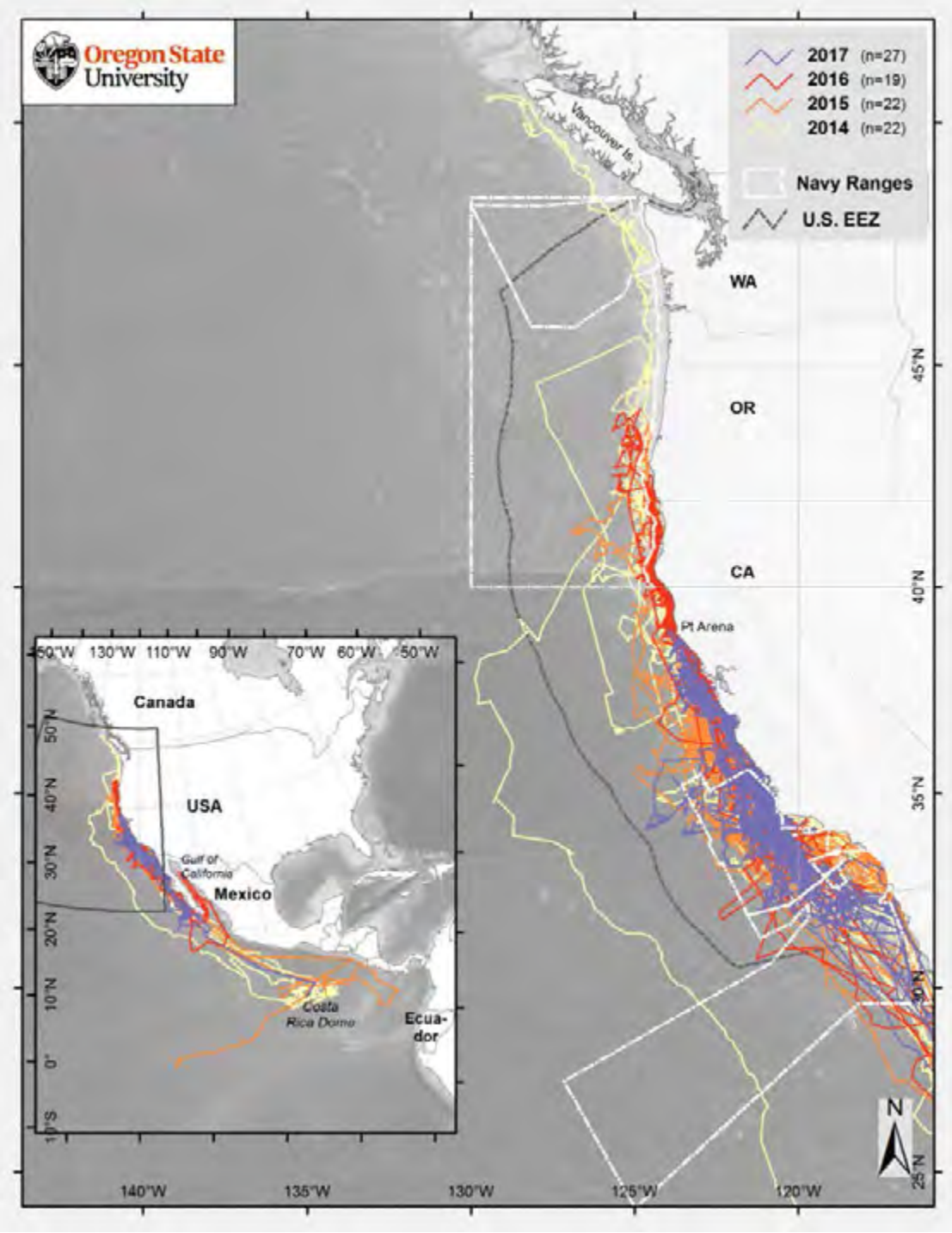
analyzed tagging data indicate that blue whales generally forage in relatively small geographic areas for relatively short time periods (Mate et al., 2015). For these reasons, delimited areas where blue whales have been observed feeding in the past may not provide an accurate prediction of where blue whales are currently feeding or may feed in the future.

The most current information suggests that the blue whale population in the HSTT Study Area may have recovered and has been at a stable level following the cessation of commercial whaling in 1971, despite the impacts of ship strikes and interactions with fishing gear (Campbell et al., 2015; Carretta et al., 2015; Monnahan, 2013; Monnahan et al., 2014; Širović et al., 2015). Rockwood et al. (2017) have suggested that death from vessel collisions may be a significant impediment to further population growth and recovery for blue whales, especially where the risk is highest on the U.S. west coast in the shipping lanes serving San Francisco and the ports of Los Angeles/Long Beach.

K.4.1.1.1 Biological Considerations Applicable to all Blue Whale Feeding Areas

The results from blue whale studies between 2014 and 2017 in Southern California, in which satellite tracking tags were attached, indicate feeding behavior was not limited to nor concentrated in designated blue whale feeding biologically important areas within the Southern California portion of the HSTTT Study Area during those years (Mate et al., 2018). Results indicate a similar pattern of broad area movement along the entire U.S. West Coast and relatively low residency time for individual whales in the Southern California portion of the HSTT Study Area. While variable by year, average individual blue whale daily movement ranged from 25 to 44 miles per day. Use of individual biological important areas by blue whales also varied by year, and time spent in areas within the Southern California portion of the Study Area was quite short. According to Mate et al. (2016), blue whales generally foraged in relatively small areas (median 7.6 km^2) for time periods ranging from less than 1 hour to 20.5 hours (a median forage time of 4.5 hours) and then moved on to other locations across the region. The median distance between foraging areas ranged from 6.5 to 27.7 km, and the maximum recorded distances between feeding areas was 211 km. A generalized feeding behavior of limited time in any one area and movements across relatively large distances (in comparison to the size of the areas designated as biologically important) between feeding areas suggests that blue whales are not wholly dependent on fixed, isolated foraging areas, rather their foraging behavior is better characterized as opportunistic and wide ranging, foraging on prey whenever and wherever concentrations are encountered. Between 2014 and 2017, blue whales were widespread in their tracked distributions, with locations over the four years extending from the northern tip of Vancouver Island, British Columbia, to very close to the equator (Mate et al., 2018). Of note, out of 92 blue whales tagged in this study, only 51 used the Southern California portion of the Study Area and only for an average of eight days per individual. Figure K.4-2 shows the cumulative blue whale tracks by year for 92 whales tagged off California between 2014 and 2017.

Five additional biologically important blue whale feeding areas located north of the Southern California Bight and outside of the HSTT Study Area were identified in Calambokidis et al. (2015). Approximately 70 percent of the 8,244 sightings recorded from 1986 to 2011 within the U.S. Exclusive Economic Zone from California to Washington occurred in these other areas. These data suggest that the majority of blue whale feeding behavior occurs far to the north of the HSTT Study Area (Figure K.4-2), a fact also supported by the 2014–2017 blue whale tagging results. For instance, of all of the biologically important blue whale feeding areas north of and outside of the Southern California portion of the Study Area, more whales used the Santa Barbara Channel and San Miguel Island areas, with a maximum residency time of 63 days.



Source: Mate et al., 2018

Figure K.4-2: Satellite-monitored Tracks in the eastern pacific for Blue Whales Tagged off California 2014-2017

Feeding and animal occurrence may vary annually, but at the time of designation, blue whale feeding areas represented locations that had more consistent occurrence annually from June to October (Calambokidis et al., 2015). The 2014–2017 tagging results also documented consistent southern transits

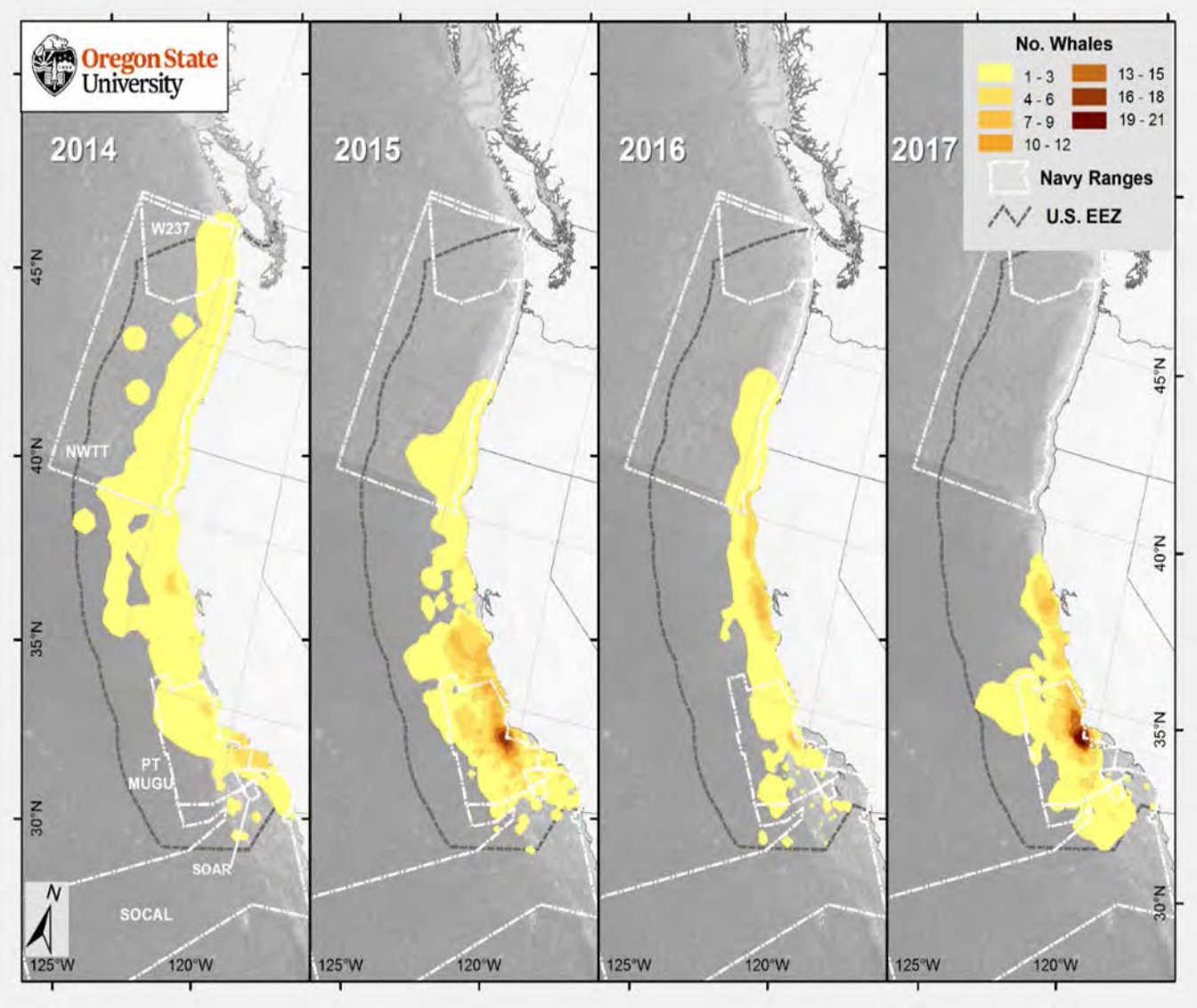
out of California heading toward the eastern tropical Pacific by the end of October. A prediction of blue whale presence based on an aggregate multi-year average may not accurately represent their presence over a short time scale. Not all blue whale behavior is associated with feeding, and can include social interaction and transit. In 2017, feeding behavior, which can be variable by individual, ranged from 16 to 62 percent of tracked time (Mate et al., 2018). Of note, more blue whale feeding activity between 2014 and 2017 occurred at lower sea surface water temperatures preferred by their krill prey (16–18 degrees C and lower). Little foraging activity in California was documented when sea surface temperatures reached 19–23 degrees C (Mate et al., 2018). Within the Southern California portion of the Study Area, sea surface temperatures have recently and likely will continue to rise higher than 18 degrees C from July–October. This further explains part of the documented northward shift in blue whale occurrence and foraging. In other words, water temperatures north and outside of the Study Area are more supportive of larger concentrations of krill, hence the blue whale occurrence in those areas.

The blue whale feeding areas are areas where blue whales have been detected on line transit surveys (six surveys between 1991 and 2008 and one in 2014) and where concentrations of blue whales and feeding behavior have been observed during small boat studies (Calambokidis et al., 2015). The boundaries of the blue whale feeding areas were delineated by enclosing an area where habitat modeling (based on line transit survey data from the various years) predicts a high density of blue whales (irrespective of any feeding behavior). Based on the average over multiple years, the delineated boundary of a feeding area represents the location where blue whales may preferentially feed, but because the ephemeral and dynamic environmental factors associated with the presence of prey are not persistent in space and time, annual variation in blue whale occurrence in these areas has been evident (Calambokidis et al., 2015; Mate et al., 2016). The inter-annual variability in oceanographic conditions should be part of the consideration when establishing any time-area management locations for feeding blue whales (Mate et al., 2016, 2018).

There are several other areas where blue whales are known to feed outside of a given blue whale feeding area, and it is likely that feeding occurs in other areas that are not yet identified. Short-to-medium duration dive behavior tags deployed on blue whales in 2014–2017 documented feeding lunges and searches in multiple areas of the HSTT Study Area as well as significantly more in areas outside of the Study Area (Mate et al, 2018). In general, the entire 200 m to the continental shelf bathymetric region from the Mexico border to Point Conception outside of the HSTT Study Area, can support opportunist blue whale foraging. In a non-El Niño or La Niña year, typical oceanographic conditions result in a strengthened southern flow of the California Current and associated coastal upwelling. The increase in upwelling (i.e., more phytoplankton nutrients) is a strong driver for increased prey concentration (i.e., krill). These conditions, however, are more prevalent during the spring and, at latest, early summer and subject to disruption from El Niño, La Niña, and other climate change factors. In fact, Mate et al. (2018) documented annual differences in overall blue whale movement patterns between 2014 and 2017.

For example, between 2014 and 2015, a total of 46 blue whales were tagged at locations just to the north of the HSTT Study Area as well as within the Southern California portion HSTT Study Area. Those animals subsequently moved as far north as British Columbia and as far south as waters very close to the equator (Mate et al., 2016). Although the timing of their seasonal presence in Southern California was the same between the two years, the distribution of the tagged animals in and around the Southern California portion of the HSTT Study Area differed significantly, with the tagged animals in 2014 distributed farther north, having larger home ranges and core areas and shorter residency than in 2015

(Mate et al., 2016). In terms of movement behavior, blue whales displayed extensive area-restricted searching behavior while in the California Current (consistent with foraging activities in small areas), but it was reduced in 2014 compared to 2015. These inter-annual differences correlated with the strong ocean temperature perturbations that took place off the west coast of North America in 2013–2015 and in 2015–2016 (Mate et al., 2016). While habitat modeling has included data from similar periods of perturbation, such variability becomes part of the average; important inter-annual differences such as these are not reflected in the static blue whale feeding area boundaries. When analyzing these tagging data to identify cumulative home ranges and core use areas, all areas mapped and predicted had consistently higher occurrence north of the HSTT Study Area (Mate et al., 2018) (Figure K.4-3).



Source: Mate et al., 2016a

Figure K.4-3: Home Ranges for Blue Whales tagged off Southern California 2014–2017.

K.4.1.2 Stressor Analysis

Blue whales, including some that were feeding, have been documented reacting to anthropogenic stressors including vessels and a variety of underwater noise sources. Reactions to vessels include shallower dives accompanied by more frequent surfacing and changes in calls associated with blue whale feeding behavior (Calambokidis et al., 2009c; Melcón et al., 2012). Data from passive recording devices showed that blue whale calls, including "D-calls" typically associated with blue whale foraging behavior, changed and decreased in the presence of mid-frequency acoustic signals and conversely increased in the presence of vessel noise. In both cases, the calls returned to baseline when exposure to these sources of noise ceased. There was no significant change in blue whale calls during noise caused by explosions (Melcón et al., 2012). In response to simulated and real sonar sources, blue whales at the surface did not show a change in behavior in response to received levels between 90 and 179 dB re 1 µPa, but deep feeding and non-feeding whales showed temporary reactions including cessation of feeding, generalized avoidance responses, and changes in dive behavior (Goldbogen et al., 2013b; Goldbogen et al., 2014). In these cases, blue whales resumed normal behavior quickly after the cessation of the mid-frequency sound exposure (Goldbogen et al., 2013b).

Given that it is unlikely that blue whales are always feeding in the most optimal location, and that these whales are highly mobile, feed over large ranges and forage in bouts separated by many kilometers, any disturbed blue whales could temporarily move to alternative foraging sites if a disturbance causes a change in their prior foraging locale. Evidence from tagged blue whales has indicated blue whale foraging is generally and widely dispersed across the offshore waters of Southern California (Mate et al., 2016, 2018). As a result, even temporary displacement from an initial foraging locality is not expected to impact the fitness of any individual animals given alternate foraging is likely to be available in close proximity (National Marine Fisheries Service, 2015).

K.4.1.2.1 Sonar and Other Transducers

As detailed in Chapter 3.7 (Marine Mammals) Section 3.7.3.1.2 (Impacts from Sonar and Other Transducers), blue whales may be exposed to sound from sonar and other transducers. Some of the blue whale feeding areas identified by Calambokidis et al. (2015) are not typical locations where significant anti-submarine warfare training occurs (insufficient area at water depth for large-scale events), for example, the San Nicolas Island and Santa Monica Bay to Long Beach Feeding Areas. Quantitative acoustic modeling estimates most exposures will result in behavioral reactions and TTS. No PTS was estimated for this species from exposure to sonar or other transducers. Behavioral reactions are unlikely to rise to the level of significant under NEPA nor would they be sustained for a duration long enough that it caused an animal to be outside of normal daily variations in feeding, reproduction, resting, migration/movement, or social cohesion. Any TTS, including in the biologically important areas, would be minor to moderate, from which the individual whale would fully recover quickly.

Research discussed in in Section 3.7.3.1.2 (Impacts from Sonar and Other Transducers), shows that if mysticetes do respond they may react in a number of ways, depending on the characteristics of the sound source, their experience with the sound source, and whether they are migrating or on seasonal grounds (i.e., breeding or feeding). Behavioral reactions may include alerting, breaking off feeding dives and surfacing, or diving or swimming away. Overall, Mysticetes have been observed to be more reactive to acoustic disturbance when a noise source is located directly on their migration route. Mysticetes disturbed while migrating could pause their migration or route around the disturbance. If disturbed

while engaged in other activities such as feeding or reproductive behaviors, they may be more likely to ignore or tolerate the disturbance and continue their natural behavior patterns. Therefore, most behavioral reactions from mysticetes are likely to be short-term and of low to moderate severity, especially when sound sources are located more than a few kilometers away and when the animals are engaged in important biological behaviors such as feeding.

Furthermore, Navy training and testing activities have been occurring in and around the entire Southern California Range Complex for decades and there has been no evidence that the activities have caused blue whales to avoid feeding habitat over the long term. Animals in the biologically important areas will always likely experience exposure to some sonar propagated from units well outside of the mitigation area. Individual blue whales spend only a small portion of their time feeding or transiting through the areas. Conversely, transiting and foraging movement may bring the same animals closer and through the feeding areas for opportunistic foraging on prey whenever and wherever concentrations are encountered, even when anti-submarine warfare training occurs. Consistent with previous NMFS consultations, the stressor analysis determined that acoustic stressors from Navy training or testing activities are not expected to result in population-level effects from behavioral responses (National Marine Fisheries Service, 2015). Therefore, significant impacts to blue whale feeding behaviors from use of sonar and other transducers are unlikely to occur within the identified blue whale feeding areas.

K.4.1.2.2 Explosive Stressors

As discussed in Section 3.7.3.2 (Impacts from Explosive Stressors), blue whales may be exposed to sound or energy from explosions associated with training and testing activities. Navy training and testing activities that use explosives could occur year-round within the Southern California portion of the HSTT Study Area; however, training and testing with explosives typically occurs only within small areas, which occur outside all of the blue whale feeding areas. Blue whales in the identified feeding area would not likely be exposed directly to sound or energy from explosives; therefore, impacts on feeding behaviors would not be anticipated within the identified blue whale feeding area from training or testing with explosives.

K.4.1.2.3 Vessel Strike

As detailed in Section 3.7.3.4.1, (Impacts from Vessels and In-Water Devices), vessel strikes have been documented for almost all of the mysticete species (Van der Hoop et al., 2015), including blue whales (Berman-Kowalewski et al., 2010; Calambokidis, 2012; Lammers et al., 2003; Van der Hoop et al., 2013; Van Waerebeek et al., 2007; Vanderlaan & Taggart, 2007). Generally, mysticetes (including blue whales) are not able maneuver to avoid vessels as compared to odontocetes. In addition, mysticetes do not typically aggregate in large groups and are therefore more difficult to visually detect from the water surface. Mysticetes that occur within the HSTT Study Area have varying patterns of occurrence and distribution which overlap with areas where vessel use associated with Navy training and testing activities would occur.

Between 1988 and 2007, 21 blue whale deaths were reported along the California coast, and many of these showed evidence of ship strike (Berman-Kowalewski et al., 2010). In 2007, National Oceanic and Atmospheric Administration declared an Unusual Mortality Event for endangered blue whales in Southern California as a result of commercial vessel ship strikes in that year. In comparison to commercial vessel strikes, within the Southern California portion of the HSTT Study Area over the last decade (from January 2007 to June 2017), the Navy has had only two whale vessel strikes, which both

occurred in 2009 and involved fin whales. Implementing the Navy's Marine Species Awareness Training, beginning in 2006, along with other existing Navy mitigation measures intended to ensure that vessels avoid whales, correlates well with the reduction of strikes on large whales by Navy vessels in the last decade.

K.4.1.2.4 Air Guns

No training activities use air guns. As discussed in Section 3.7.3.1.3 (Impacts from Air Guns), testing activities would include the use of single air guns in the Southern California portion of the HSTT Study Area. Acoustic modeling predicts one blue whale behavioral reaction annually from the use of air guns during testing in the Southern California portion of the HSTT Study Area. Single, small air guns are not capable of injuring marine mammals. Because noise from air gun activities is short-term and intermittent, it is unlikely that a marine mammal would be exposed to noise that would result in any more than a short-term and mild to moderate behavioral responses. Marine mammals engaged in activities such as feeding may be even more likely to ignore or tolerate potential disturbance created by air gun use and continue their natural behavior patterns and any response is likely to be short-term, minor behavioral responses.

K.4.1.3 Santa Monica Bay to Long Beach Blue Whale Feeding Area, HSTT Settlement Area 3-C, and California Coastal Commission 3 NM Area

The Santa Monica Bay to Long Beach Blue Whale Feeding Area is 1,187 km^2 in area and approximately 20 km at its widest point and 54 km long (Calambokidis et al., 2015). The area extends from the middle of Santa Monica Bay to Long Beach and is shaped like an irregular rectangle wrapping from the middle of the Santa Monica Bay around Point Vicente, encompassing the Point Vicente State Marine Conservation Area and Abalone Cove State Marine Conservation Area, and into Long Beach Harbor to Huntington Beach (Figure K.4-1). The area reaches a maximum depth of 892 m and is considered to be nearshore habitat. The area extends offshore into the Santa Pedro Channel, which separates Santa Catalina Island from the mainland. The southernmost portion of the Santa Monica to Long Beach feeding area extends approximately 5 NM into the northern portion of the HSTT Study Area above Santa Catalina Island. The Santa Monica Bay to Long Beach Feeding Area overlaps in part with HSTT Settlement Area 3-C and the California Coastal Commission (CCC) 3 NM Shore Area.

K.4.1.3.1 Navy Requirements for Area Specific Training and Testing

The Santa Monica to Long Beach Blue Whale Feeding Area mainly lies north and outside of the HSTT Study Area. Only a very small portion overlaps the HSTT study area. As such, this area is remote from the primary training areas within the Southern California portion of the HSTT Study Area and does not contain any specific training related infrastructure, is outside of Special Use Airspace (W-291), and is not within any scheduled range area. As it is along the northern most edge of the HSTT Study Area, it is not an area where coordinated or major training exercises would typically occur. Vessels transiting between Naval Magazine Seal Beach and Naval Station San Diego would transit this area and may use surface ship hull-mounted mid-frequency sonar in unit level training opportunistically or maintenance. In-water explosives are not used within this area.

The Navy's continued access to the large unobstructed areas of open sea and air space required in support of modern training and testing and to operate safely without impeding the effectiveness of the training or testing, is becoming increasingly tenuous due to competition for space and conflicting uses. Any future plans for fixed offshore facilities such as natural gas terminals, aquaculture projects, and wind energy could also erode training realism and value by further segmenting training space and

creating additional avoidance zones. As (and if) additional restrictions are imposed within the Southern California Range Complex, the Santa Monica to Long Beach Blue Whale Feeding Area may be used with greater frequency.

Similar to training, the Santa Monica to Long Beach Blue Whale Feeding Area is not a primary testing location; however, the area may be used in the future to test endurance and navigation capabilities of autonomous unmanned vehicles where operation within littorals is a test parameter. In-water explosives are not used within this area during testing activities.

K.4.1.3.2 Santa Monica Bay to Long Beach Blue Whale Feeding Area and California Coastal Commission 3 NM Shore Area Mitigation Considerations

Some blue whale feeding behavior has been shown to be affected by sonar, vessel noise, and explosives. In these cases, blue whales resumed normal behavior quickly after the cessation of the exposure (Calambokidis et al., 2009c; Goldbogen et al., 2013b; Melcón et al., 2012). Evidence from tagged blue whales has indicated blue whale foraging is generally and widely dispersed across the offshore waters of Southern California (Mate et al., 2016). If a feeding blue whale reacted by avoiding the vicinity of a Navy activity, any disturbed blue whales would temporarily move to alternative foraging sites. It is also unlikely that blue whales are always feeding in the most optimal location – these whales are highly mobile, feed over large ranges and forage in bouts separated by many kilometers.

The Santa Monica Bay to Long Beach Blue Whale Feeding Area and California Coastal Commission 3 NM Shore Area are not part of the primary training areas within the Southern California portion of the HSTT Study Area. In addition, there is very little overlap of the biologically important area with the HSTT Study Area. Given this, geographic mitigation measures would not be effective in reducing adverse impacts as none are anticipated since these areas are not generally used in training or testing involving sonar, explosives, or airguns.

K.4.1.4 San Nicolas Island Blue Whale Feeding Area, Settlement Area 4-A

The San Nicolas Island Blue Whale Feeding Area is 86 km^2 in area and is approximately 7 km at its widest point and 18 km at its longest point (Calambokidis et al., 2015). The area is located less than 5 NM from San Nicolas Island's northeast shoreline (Figure K.4-1). The area reaches a maximum depth of 942 m at the edge of the Santa Cruz Basin. The San Nicolas Island Blue Whale Feeding Area extends approximately 5 NM into the northern portion of the HSTT Study Area. The San Nicolas Island feeding area overlaps in part with HSTT Settlement Area 4-A.

K.4.1.4.1 Navy Requirements for Area Specific Training and Testing

The San Nicolas Island Blue Whale Feeding Area mainly lies north and outside of the HSTT Study Area. While a small portion overlaps the HSTT Study Area, this portion of the San Nicolas Island Blue Whale Feeding Area does lie north of the heavily used Southern California Anti-submarine Warfare Range instrumented range.

While this area does not provide primary support to integrated/coordinated or major training exercises, the area north of the Southern California Anti-submarine Warfare Range and south of the San Nicolas Island Feeding Area could be used to support necessary safe separation between vessels and events on and around the Southern California Anti-submarine Warfare Range. No training or testing with explosives is conducted within the San Nicolas Island Blue Whale Feeding Area.

The Navy's continued access to the large unobstructed areas of open sea and air space required in support of modern training and testing and to operate safely without impeding the effectiveness of the

training or testing, is becoming increasingly tenuous due to competition for space and conflicting uses. Any future plans for fixed offshore facilities such as natural gas terminals, aquaculture projects, and wind energy could also erode training realism and value by further segmenting training space and creating additional avoidance zones. As (and if) additional restrictions are imposed within the Southern California portion of the HSTT Study Area, the San Nicolas Island Blue Whale Feeding Area may be used with greater frequency as it does possess complex and challenging bathymetry necessary to support anti-submarine warfare.

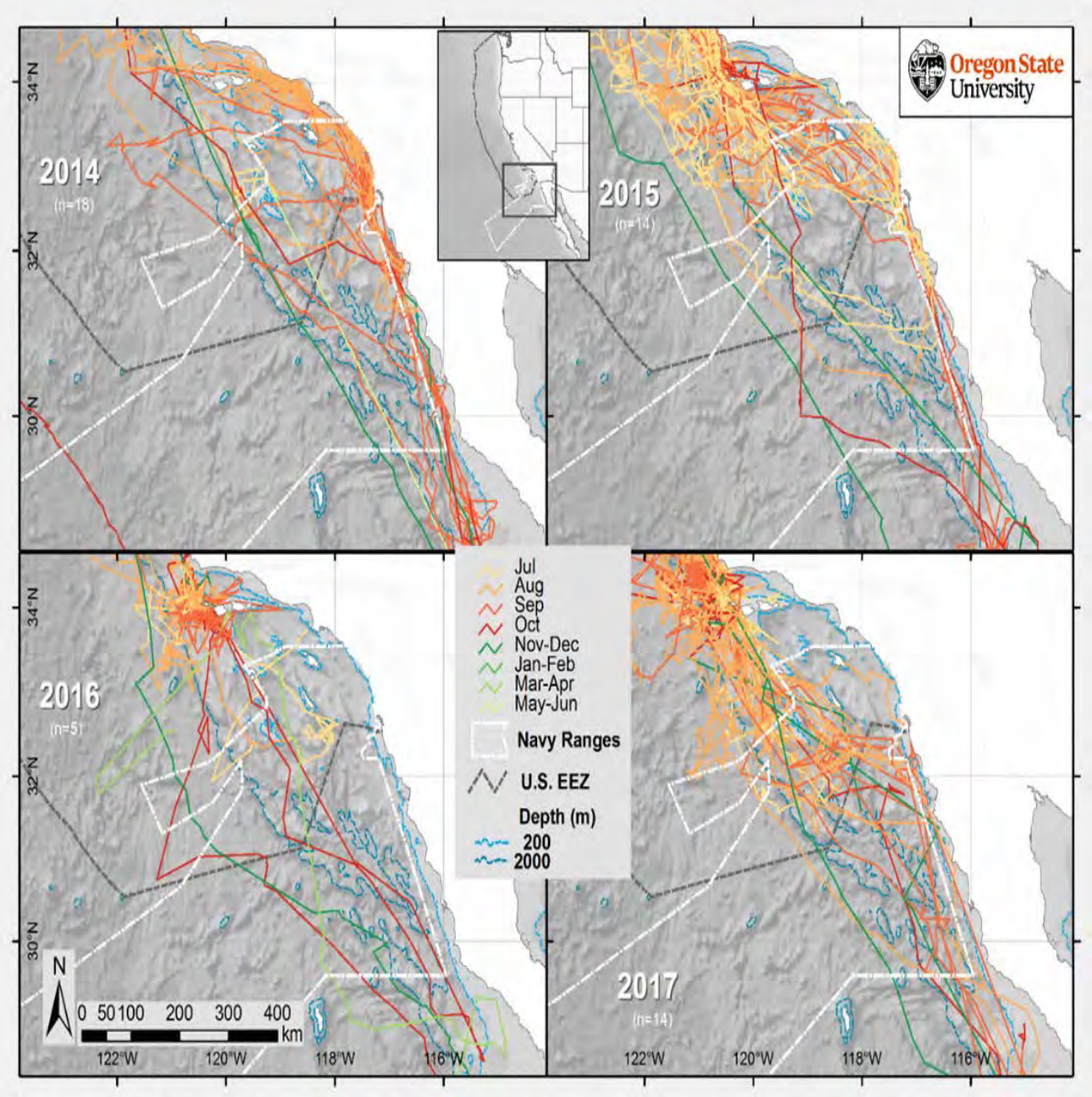
K.4.1.4.2 San Nicolas Island Blue Whale Feeding Area Mitigation Considerations

Some blue whale feeding behavior has been shown to be affected by sonar, vessel noise, and explosives. In these cases, blue whales resumed normal behavior quickly after the cessation of the exposure (Calambokidis et al., 2009c; Goldbogen et al., 2013b; Melcón et al., 2012). Evidence from tagged blue whales has indicated blue whale foraging is generally and widely dispersed across the offshore waters of Southern California (Mate et al., 2016). If a feeding blue whale reacted by avoiding the vicinity of a Navy activity, any disturbed blue whales would temporarily move to alternative foraging sites. It is also unlikely that blue whales are always feeding in the most optimal location – these whales are highly mobile, feed over large ranges and forage in bouts separated by many kilometers.

The San Nicolas Island blue whale feeding area overlap is at the northern edge of the HSTT Study Area and so while that location is not the focal point of training, it is northwest of the Southern California Anti-submarine Warfare Range off San Clemente Island and the location could be used to support necessary safe separation between vessels and events on and around that range.

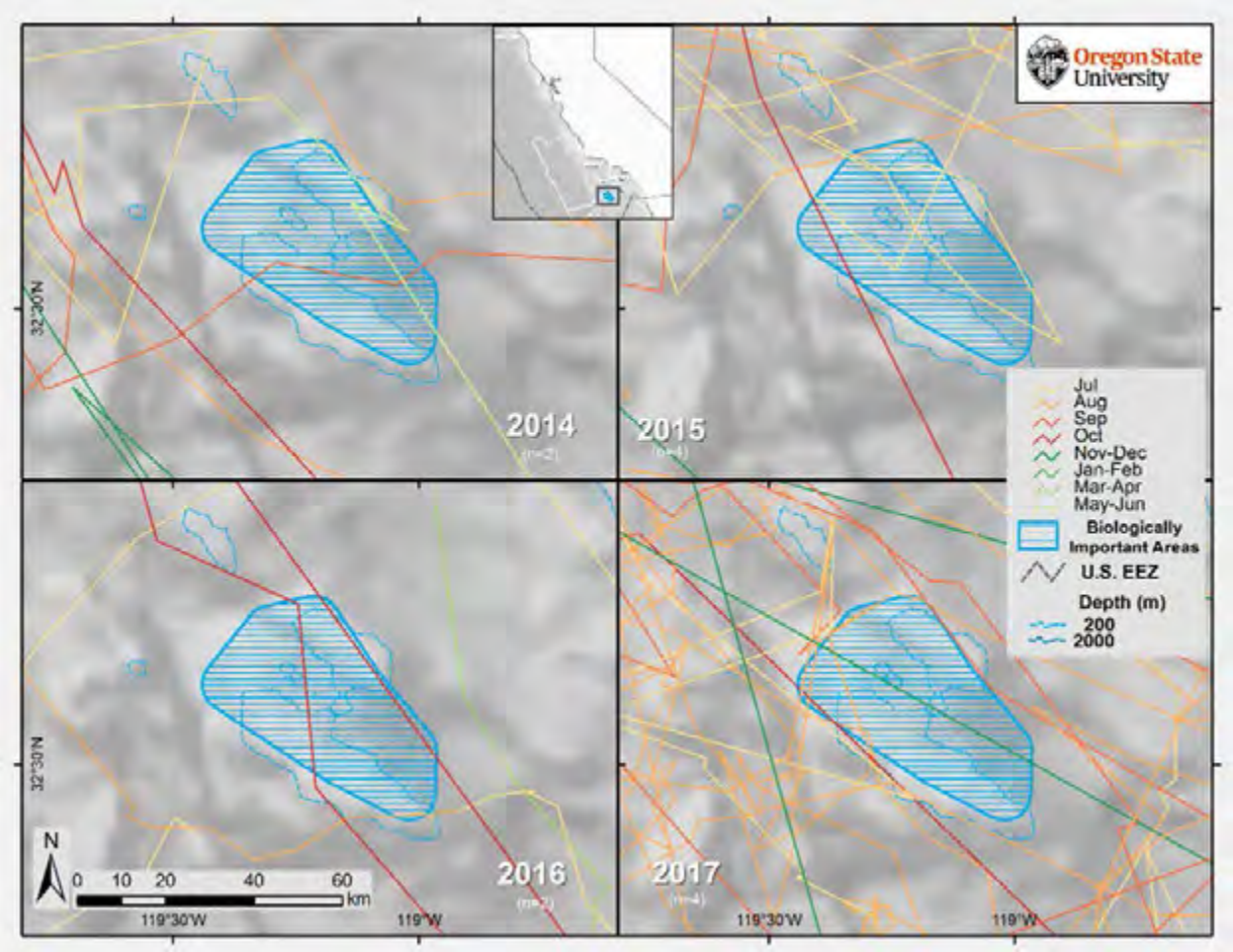
K.4.1.5 Tanner-Cortes Bank Blue Whale Feeding Area, Settlement Area 4-C

The Tanner-Cortes Bank Blue Whale Feeding Area is 1,075 km^2 in area and approximately 29 km at its widest point and 43 km long. The area is approximately 56 km off of the west coast of San Clemente Island and 167 km west of San Diego (Calambokidis et al., 2015) (Figure K.4-1) The designated Tanner-Cortes Bank Blue Whale Feeding Area reaches a maximum depth of 1,232 m and has a minimum depth of just 2 m at Cortes Bank which may break the water surface under certain conditions. There are deep water areas in adjacent basins: Tanner Basin to the northwest, San Nicolas Basin to the northeast, and East Cortes Basin to the south of Tanner-Cortes Bank. The entire Tanner-Cortes Bank Blue Whale Feeding Area is within the Southern California portion of the HSTT Study Area (Figure K.4-4 and Figure K.4-5).



Source: Mate et al. (2018)

Figure K.4-4: Blue Whale Movements from 2014 through 2017 in the Eastern Pacific Relative to the HSTT Study Area



Source: Mate et al. (2018)

Figure K.4-5: The Limited Number of Tagged Blue Whale Transits Through Tanner-Cortes Bank from 2014 through 2017

K.4.1.5.1 Navy Requirements for Area Specific Training and Testing

Tanner-Cortes Bank provides, and has provided, unique and irreplaceable training capability for unit-level through Strike Group training and certification in the Southern California Range Complex.

The complex bathymetry of Tanner-Cortes Bank, off shore shallow/very shallow areas proximate to steep gradients and very deep waters where sound propagation profiles create a challenging acoustic environment, are not found elsewhere in the Southern California offshore region (Figure K.4-1). Tanner-Cortes Bank replicates many of the areas where our sailors will be called upon to serve, protecting freedom of navigation while defending against ultra-quiet diesel electric submarines.

Tanner-Cortes Bank provides unique attributes and unmatched opportunity to train in searching for submarines in shallow water. Littoral training allows units to continue to deploy improved sensors or tactics in littoral waters in the future. In the Southern California portion of the HSTT Study Area specifically, anti-submarine warfare training in shallow water is vitally important to the Navy since diesel submarines typically hide in that extremely noisy and complex marine environment (Arabian Gulf, Strait of Malacca, Sea of Japan, and the Yellow Sea all contain water less than 200 m deep). There is no other area in the Southern California portion of the HSTT Study Area with the bathymetry and sound

propagation analog to seas where Navy conducts real operations that this training could relocate to. The Navy cannot conduct realistic shallow water training exercises without training in and around Tanner-Cortes Bank.

In addition, this area includes unique shallow water training opportunities for unit-level trainings, including opportunity to practice operations in littoral areas that are both shallow, and navigationally constrained, and in close proximity to deeper, in-water instrumentation. Tanner and Cortes Bank's unique bathymetry offers Strike Groups integrated air, submarine, and surface vessel assets the unique training opportunity to navigate through restricted water space while providing protection to high value units (e.g., aircraft carriers). Mid-frequency active sonar would be used during these training events. Training and certifications are conducted throughout year in support of Pacific Command/Joint Staff ordered deployment requirements and multiple mission crew readiness.

During anti-submarine warfare events, submarine crews will need to train with surface vessels using mid-frequency active sonar as part of anti-submarine warfare tactics (e.g., tracking and torpedo exercises) and active sonar avoidance in shallow water and adjacent deep water. The unique bathymetry provides submarine commanders a complex seascape in which they can sharpen their skills of maintaining stealth while achieving mission goals. Conversely, surface ships, aircrews, and submarines benefit from this same challenging sea space to sharpen their skills in utilizing all of the tools available to them, including mid-frequency active sonar to detect, locate, track, and prosecute submarine threats.

The ability to perform this high value unit level and Integrated/Coordinated Anti-Submarine Warfare training year-round in support of deployment schedules and evolving world events, as well as during times of darkness, rough seas, inclement weather, and other difficult conditions help to ensure our sailors and aviators have the highest degree of proficiency necessary to prevail and survive any encounter with hostile threats.

Tanner-Cortes Bank presents an important anti-submarine and mine warfare training venue for unit level through integrated training where year-round access cannot be compromised. This area replicates areas encountered by surface ships in the Western Pacific today. For these reasons alone, access to this critical training venue cannot be compromised or limited in any way. Additionally, the Tanner -Cortes Bank possesses other attributes of importance to Anti-Submarine and Mine Warfare training:

A shallow water minefield training range containing multiple surveyed bottomed and tethered mine shapes in shallow water is located here. Existing instrumentation includes submerged submarine positioning with Submerged Acoustic Navigation System buoys. Given the bathymetry of real world threats and the proximity to the Southern California Anti-submarine Warfare Range deep water instrumented range (valued at $250M), Tanner-Cortes Bank has no equal for submarine mine countermeasure detection and maneuver training. This range supports submarine mine countermeasures training and certification training.

An instrumented Shallow Water Training Range extension to the nearby Southern California Anti-submarine Warfare Range is planned for this area and has been approved by Deputy Assistant to the Secretary of the Navy and is supported by the 2009 Southern California Range Complex EIS/OEIS and Record of Decision. This Shallow Water Training Range extension supports U.S. Commander, Third Fleet long-standing requirement for a seamless deep-to-shallow water tracking and communication range. Installation is planned within the next decade.

- Tanner-Cortes Bank is relatively close to San Diego homeports and other Southern California ranges areas which reduces fuel costs and transit times while maximizing time on the range available to training.
- Tanner-Cortes Bank is within the Federal Aviation Administration approved Warning Area 291 (W-291), helping to ensure the safety of non-military air traffic, and providing training opportunities to fly unmanned aerial systems as a force multiplying Intelligence, Surveillance, and Reconnaissance asset.
- Major training anti-submarine warfare training events focus on the "central" location of Tanner-Cortes Bank and the nearby Southern California Anti-submarine Warfare Range as units conduct other major training exercises in surrounding areas (e.g., east of San Clemente Island, within the Fleet Training Area [FLETA HOT]). Being within W-291, surface training events utilizing explosive munitions could be conducted here. Similar to training, testing of anti-submarine and mine warfare systems depends on the complex and challenging environment found in Tanner-Cortes Bank.

Some MH-60 helicopter testing currently occurs and will continue to occur under the Proposed Action within the Tanner-Cortes Bank Blue Whale Feeding Area. This testing generally occurs off the west coast in conjunction with Fleet activities, usually during an anti-submarine warfare training event, but may also be done as a stand alone anti-submarine testing activity. If the Tanner-Cortes Bank became excluded/restricted it would eliminate an important location for the testing program offices, increasing program costs, delaying program schedules, and delaying the delivery of weapon systems to the Fleet.

Additionally, testing within Tanner-Cortes Bank includes Surface Warfare Mission Package Testing (medium caliber gun and missile/rocket testing), countermeasure testing, at-sea sonar testing, mine countermeasure mission package testing, and unmanned vehicle development and payload testing. Specifically, Torpedo (non-explosive) Testing is frequently conducted off San Clemente Island in the Southern California Anti-submarine Warfare Range, Shore Bombardment Area, and Tanner-Cortes Bank locations. Environmental parameters of the San Clemente Basin/Tanner-Cortes area are essential to completing torpedo (non-explosive) testing, and mine detection and mine countermeasure and neutralization testing. At-sea sonar testing is essential to ensuring systems are fully functional in a diverse open ocean environment, including waters near Tanner-Cortes Bank.

Both developmental and operational testing scenarios are needed to fully test all systems. The ability to test the efficacy of systems in an area that reflects real world conditions must be preserved. Subsequently, restricting testing in realistic environments would impact the final evaluation of a system’s performance and could possibly result in delays in Fleet readiness.

K.4.1.5.2 Tanner-Cortes Bank Feeding Area Mitigation Considerations

The Tanner-Cortes Bank Blue Whale Feeding Area accounted for 0.6 percent of the 8,244 documented sightings within the Exclusive Economic Zone from California to Washington from 1986 to 2011 (Calambokidis et al., 2015). Data from a number of years and sources (Calambokidis et al., 2009b; Calambokidis & Barlow, 2013; Douglas et al., 2014; Irvine et al., 2014; Mate et al., 2016) consistently indicate large interannual variability in blue whale presence in small specific areas like the feeding areas and over shorter time scales such as those considered for Navy training and testing events.

The Tanner-Cortes Bank Blue Whale feeding area boundary was drawn by enclosing the locations of 52 blue whales sighted during small boat surveys over a 5-year period from 1986 to 2011 (Calambokidis et al., 2015). In general and since 2009, it has been recognized that there has been a northward shift in

blue whale distribution including the waters of the HSTT Study Area (Barlow, 2010; Calambokidis et al., 2009b; Calambokidis & Barlow, 2013; Carretta et al., 2016a; Širović et al., 2015). Based on satellite tags on 171 blue whales between 1993 and 2008, the blue whale home range and core area in Southern California derived by Irvine et al (2014) were both centered to the north of the northern Channel Islands (north of San Miguel and Santa Cruz), which is far to the north of the HSTT Study Area. Data from 22 blue whales tagged in Southern California between August and September in 2014, showed that 18 spent time within the Southern California portion of the HSTT Study Area with only one spending some time within the Tanner-Cortes Bank area (Mate et al., 2015). Cumulatively, for both the 2014 and 2015 tracking efforts, only 4 out of 65 tagged blue whales occurred in or transited through Tanner-Cortes Bank accounting for <1 to one day (Mate et al., 2015) (Figure K.4-3 and Figure K.4-5). These results are consistent with the location being over a single, very localized bathymetric feature where large and persistent prey aggregations may not develop every year or where they had in the past.

The Navy has been training and testing in the area with the same basic systems in Southern California for over 40 years. Indications are that the blue whale population in the HSTT Study Area may have recovered from its status as an endangered species and that the population has been stable following the cessation of large scale commercial whaling (Campbell et al., 2015; Carretta et al., 2015; Monnahan, 2013; Monnahan et al., 2014; Širović et al., 2015).

Blue whale feeding behavior has been shown to be affected by sonar, vessel noise, and explosives. In these cases, blue whales resumed normal behavior quickly after the cessation of the exposure (Calambokidis et al., 2009b; Goldbogen et al., 2013b; Melcón et al., 2012; Oleson et al., 2009; Southall et al., 2013) and evidence from tagged blue whales has indicated blue whale foraging is generally and widely dispersed across the offshore waters of Southern California (Mate et al., 2016).

While Navy training and testing activities have been occurring in and around Tanner-Cortes Banks for decades, research conducted by Calambokidis and Mate, who observed feeding blue whales persisting in Tanner-Cortes Banks, provides evidence that the activities have not caused blue whales to avoid that habitat. In the case of the Eastern North Pacific Stock of blue whales, this species population is stable (Campbell et al., 2015; Carretta et al., 2015; Monnahan, 2013; Monnahan et al., 2014; Monnahan et al., 2015; Širović et al., 2015) and is approaching or at the carrying capacity of the ecosystem (Monnahan, 2013; Monnahan et al., 2014; Monnahan et al., 2015). Blue whales are likely to have energy reserves sufficient to meet the demands of their normal behavioral patterns and an additional response to Navy activities, if there is any response at all.

As noted earlier, the Tanner-Cortes Banks area is home to a large number of important training and testing activities that are essential to military readiness and the Navy meeting its Title 10 responsibilities. Complete or even partial avoidance of the Tanner-Cortes Bank Blue Whale Feeding Area and the relocation of Navy training and testing activities would curtail Navy use of this critical and unique bathymetric feature, reducing the realism and effectiveness of training and testing activities. Furthermore, avoiding the area by relocating activities is not likely to significantly reduce impacts on blue whale feeding behavior given that research indicates that observed feeding blue whales persist in the Tanner-Cortes Bank, providing evidence that the Navy's activities have not caused blue whales to abandon or avoid that habitat (Calambokidis et al., 2015; Mate et al., 2016).

Navy training and testing events occur over extremely short time scales relative to the multi-year data supporting delineation of the biologically important areas. As a result of the dynamic presence or absence of prey in any one area and the associated response of blue whales to prey location, the

seasonal avoidance of a statically bounded area such as the Tanner-Cortes Bank Blue Whale Feeding Area is unlikely to be effective at reducing impacts on blue whales, including blue whale feeding behavior. To account for the dynamic and variable presence of prey and feeding blue whales in the Southern California portion of the HSTT Study Area, the most effective mitigation measures are those that the Navy already employ based on the immediate and actual detected presence of the species in the location where an event will take place or is occurring.

The Tanner-Cortes Bank Feeding Area also overlaps in part with HSTT Settlement Area 4-C (Figure K.4-1). One condition imposed by Settlement Area 4-C states the Navy shall require, from June 1 through October 31, that all surface vessels use extreme caution and proceed at safe speeds so they can take proper and effective action to avoid a collision with any sighted object or disturbance, and that the vessel can be stopped within a distance appropriate to the prevailing circumstances and conditions. The intention of this condition is to reduce Navy vessel strikes on whales, however, the condition adds no additional procedures beyond the Navy's current and longstanding standard operating procedures discussed in Section 2.3.3, (Standard Operating Procedures). Navy vessel strikes on whales are rare (see details presented in Appendix F, Military Expended Material and Direct Strike Impact Analyses) and none have occurred in the Tanner-Cortes Bank Feeding Area or the area defined through negotiations with the California Coastal Commission. The measure simply restates the vigilance a ship's crew already applies to avoid a collision with any object (including a whale); there are no additional procedural measures or enhancements to existing procedures that would further reduce the potential for a vessel strike. Requiring Navy vessels to limit speeds to a pre-determined level would unacceptably impact mission readiness. As the likelihood of a Navy vessel striking a marine mammal is extremely low, the Navy will not implement mitigation that restricts vessel speed because Navy vessel operators need to learn to operate vessels as they would in real world combat situations (including being able to react to changing tactical situations and evaluate system capabilities). For some activities, vessels must maintain a certain speed to carry out the activity safely. For example, during flight operations, an aircraft carrier must maintain a certain wind speed over the deck to launch or recover aircraft. Depending on wind conditions, the aircraft carrier itself must travel at a certain speed to generate the wind required to launch or recover aircraft. Vessel speed restrictions would prevent vessel operators from gaining skill proficiency, would prevent the Navy from properly testing vessel capabilities (e.g., full power propulsion testing during sea trials), and could significantly increase the time and fuel it takes to reach training and testing locations; therefore, the mitigation would have significant impacts on the Navy's ability to train and test, and would prevent the Navy from meeting its mission requirements.

However, cautionary alerts such as seasonal notices informing vessels that certain species may be present in higher concentrations for feeding or may be migrating through an area may afford for a general heightened level of awareness, not only within a delimited biologically important area but also in the surrounding region where the behavior is also likely to occur. As discussed in Section K.2.3.4 (Awareness Notification Messages), the Navy proposes to issue seasonal large whale awareness notification messages to remind ships and aircraft to maintain extra vigilance during transit and to maintain safe speeds commensurate with operational timelines, training requirements, or logistic needs, and for safety of navigation to avoid interactions with large concentrations of blue whale in the near shore area out to 20 NM from the Southern California mainland from June to October.

As discussed in Section K.4.1.5.1 (Navy Requirements for Area Specific Training and Testing), any geographic mitigation imposed for the Tanner-Cortes Bank Blue Whale Feeding Area would significantly impact Navy's use of this critical and unique training area that cannot be replicated elsewhere in the

Southern California and would not be practicable to implement or effectively further reduce adverse impacts on the blue whale population since none are anticipated.

K.4.1.6 San Diego (Arc) Blue Whale Feeding Area; Settlement Areas 3-A through 3-C, California Coastal Commission 3 NM Shore Area, and San Diego Arc Area

The San Diego Blue Whale Feeding Area is 984 km^2 in area and approximately 50 km at its widest point and 25 km long. The area extends along the coast from Carlsbad Canyon to La Jolla Canyon, and offshore into the San Diego Trough (Calambokidis et al., 2015) (Figure K.4-1). Depth in the feeding area ranges from 15 m to 1,221 m. The entire San Diego Blue Whale Feeding Area overlaps with the HSTT Study Area. The San Diego Blue Whale Feeding Area overlaps in part with HSTT Settlement Areas 3-A through 3-C, and the California Coastal Commission 3 NM Shore Area and San Diego Arc Area.

K.4.1.6.1 Navy Requirements for Area Specific Training and Testing

The Blue Whale Feeding Area proximate to San Diego (also known as the San Diego Arc) is in close proximity to San Diego (a fleet concentration area for home ported naval vessels and home based helicopters). The area experiences a high volume of ongoing training and testing activities occurring in waters within and just west of the arc as an important training area within the Southern California portion of the HSTT Study Area. Factors that support this include:

- The San Diego Arc's complex acoustic oceanographic conditions present challenging, near shore training conditions. Unique bathymetric features make it an ideal and challenging location to conduct anti-submarine warfare in the nearshore environment. For example, the middle of the Arc transitions rapidly from shallower waters <200m depth to depths over 800m.
- This OPAREA is supported by existing infrastructure to include personnel, piers, boats, and substantial communications networks.
- Established training areas fall within, or are immediately proximate to the San Diego Arc:
- The Advanced Research Projects Agency training minefield is within the San Diego Arc. Mid- and high-frequency mine detection systems are used in this area. Future mine neutralization systems employing explosives could be used in this area. This range was established in an area with specific relatively shallow to deep bathymetry that is well suited for safe submarine navigation and training effectiveness.
- The Imperial Beach minefield is located just south of the San Diego Arc. Explosive mine neutralization is conducted in this shallow water range. This minefield will be critical in supporting future training with Littoral Combat Ship Mine Warfare Mission Modules.
- Camp Pendleton and the near shore Camp Pendleton Amphibious Assault Area are located north of the San Diego Arc.
- Established helicopter dipping locations within W-291 (Victor through Zulu) exist beyond the San Diego Arc. These are areas where helicopters can perform no-notice anti-submarine unit level training not requiring an instrumented range while remaining under the Fleet Area Control and Surveillance Control Facility for enhanced safety-of-flight. Dipping boxes are as close to the air station as practical to limit transit time while still being encompassed by the warning area.
- Naval Air Station North Island helicopters conduct extensive Search and Rescue operations in the Bravo, Charlie, and Delta Dip areas that lie within the Arc. These areas offer unique traffic avoidance by providing a designated operating area in uncontrolled airspace outside of W-291

yet within close proximity to Naval Air Station North Island. Encinitas Naval Electronic Testing Area is used primarily for Space and Naval Warfare Systems Command testing activities.

- W-291, special use airspace, begins just west of the San Diego Arc. W-291 overlays numerous established Southern California ranges and training venues. The sea space east and outside of W-291 allows individual vessels the opportunity to conduct certain underway events, such as onboard system checks/drills, crew small arms qualifications, etc. outside of the heavily scheduled and utilized eastern portion of W-291.

The San Diego Arc training and testing activities rely on the attributes of this area such as proximity to Naval Base San Diego, Naval Air Station North Island, Naval Base Point Loma, and Marine Corps Base Camp Pendleton; proximity to established ranges such as the Imperial Beach minefield; and shallow, near shore bathymetry. Navy vessels departing San Diego must transit west though the San Diego Arc in route to the training venues located in the eastern the Southern California Range Complex OPAREA (e.g., Southern California Anti-Submarine Warfare Range, San Clemente Island, or north in route to training venues along the coast [see Figure K.4-1]). In order to support fleet deployments and emergent world events, transits through the arc as well as the training that occurs within and beyond the arc occurs year-round. Key training needs that can occur within or adjacent to the San Diego Arc during transits to and from San Diego as well as while at-sea include:

- System Checks to ensure mid-frequency acoustic sonar systems are functioning properly while getting underway occur within the San Diego Arc. These events must occur close to port, they cannot be deferred until the vessel is well out to sea for safety reasons.
- Object detection with mid-frequency acoustic sonar occurs within the San Diego Arc while ships are getting underway. Object detection is conducted in the relatively shallow approaches to harbors and ports.
- Unit level training in anti-submarine warfare (surface ship), are primarily events of opportunity that occur when submarines are transiting through the area.
- Helicopters conduct dipping sonar system checks in Dip Box Charlie. These checks are to ensure proper system operation while still relatively close to shore.
- Major training events conducting anti-submarine warfare is not typically performed in the San Diego Arc as most major training exercises (with the exception of major training exercise related mine warfare and amphibious events) occur further offshore and within W-291 and associated training areas.
- Submarines transiting through the San Diego Arc conduct anti-submarine warfare that involves active sonar use when surface ships are participating. This area provides additional opportunity for units to conduct anti-submarine warfare in relatively shallow water.
- Submarines transiting through the San Diego Arc conduct Intelligence, Surveillance, and Reconnaissance in a near shore, congested marine environment. This activity could involve the use of unmanned underwater vehicles and unmanned aerial systems. For submarines to conduct Intelligence, Surveillance, and Reconnaissance against shore based locations, the submarines are required to be relatively close to shore.
- Vessels run "Q Routes" as part of mine warfare training while transiting north/south. Q Routes develop skills needed for ships to carefully negotiate though shallow water areas where naval mines are known to exist. Mid-frequency active sonar may be employed during these events. Q

Routes must be established along a continuous stretch of shallow sea space, ideally beginning at port which makes a traverse up the coast ideal.

- Mine warfare events associated with biennial Rim of the Pacific and Civilian Port Defense/Homeland Security training occur in the San Diego Arc as well as the ship channels east and within San Diego Harbor. Skills needed to ensure safe access to ports and harbors of national significance can only be acquired by training in the congested environment surrounding those ports. The importance of San Diego Harbor, as well as the fact that San Diego is home to many of the commands that support the mine warfare mission, makes this the ideal and logical location for this training.
- Littoral Combat Ships located in San Diego will begin training in the near shore waters and established mine warfare ranges within the San Diego Arc with mine warfare (high-frequency acoustic sonar systems) and anti-submarine warfare mid-frequency active sonar mission packages once these capabilities are developed.

Other factors that may impact Navy use of the San Diego Arc include:

- Competing uses and conflicts: The Navy's continued access to the large unobstructed areas of open sea and air space required in support of modern training and testing is becoming increasingly tenuous due to competition for space and conflicting uses. Future plans for fixed offshore facilities such as natural gas terminals, aquaculture projects, and wind energy could also erode training realism and value by further segmenting training space and creating additional avoidance zones.
- Evolving training requirements: Increasing threats in the littoral regions such as silent diesel electric submarines and readily available naval mines compel us to develop systems, tactics, and capabilities to meet this challenge.

Future upgrades to hull-mounted mid-frequency active sonar systems and introduction of the Littoral Combat Ship anti-submarine warfare mid-frequency active sonar and mine warfare mission modules will increase the Navy’s littoral capabilities and the requirement to train in the near shore relatively shallow environment of the San Diego Arc. The ever present threat of naval mines has resulted in a coalescence of mine warfare capable forces and platforms in the San Diego Fleet Concentration area. As evidenced by Rim of the Pacific related mine warfare activity, San Diego is the Pacific Fleet’s primary venue of choice for mine warfare activities due to the availability of capable ranges and supporting commands such as Naval Expeditionary Combat Forces, Explosive Ordnance Disposal teams, and Coastal Riverine Group. The need for access to the near shore littoral environment will only increase over time.

Based on the above listed factors, the area of the San Diego Arc is demonstrated to provide high readiness value. If this area was to become restricted in any broadly defined way, needed capabilities would be lost and fleet readiness would be diminished.

Activities utilizing active acoustic sources are conducted in this area and in certain cases can only be conducted here:

- The San Diego Arc overlays the entrance to Naval Base San Diego where submarines are home based. Helicopters stationed at Naval Air Station North Island fly out to meet and train against transiting submarines. The close proximity of San Diego Arc to Naval Air Station North Island along with the high concentration of transiting submarines maximize on station training time for these fuel and speed restricted aircraft against realistic targets. This training opportunity would be lost or significantly impacted if the use of mid-frequency active sonar systems was prohibited

in this area [as seasonally restricting this activity would lead to some of the aircrews who rotate between deployments losing the ability to conduct this valuable training while at their home station.] Lost opportunities to conduct realistic training in this challenging near shore environment will erode anti-submarine warfare proficiency.

- Ships energize hull-mounted mid-frequency active sonar systems to conduct system checks and maintenance after leaving port and while transiting through this area. Restricting mid-frequency active sonar systems use would force sailors to conduct these needed operational checks further out to sea, expending extra fuel and possibly creating a safety concern if a system failure was to occur far from port.
- Mine detection requires the use of active acoustics, either ship hull-mounted mid-frequency active sonar systems or deployable high-frequency systems. Civilian port defense requires that approaches and channels be surveyed for the presence of naval mines. Restricting active acoustic sources would limit the ability to clear the approaches to San Diego Harbor. While this skill could be acquired at other ports, that would require unnecessary mobilization to remote areas and would diminish the experience of actually operating at the important Port of San Diego.
- The San Diego Arc fully overlays the Advance Research Projects Agency Minefield. Restricting active acoustic mine detection at this established range would render it useless. While other mine warfare ranges exist in the study area, notably the Tanner Bank range which is also located in a seasonal blue whale feeding area, they are either unsafe/unsuitable for submarine use (Imperial Beach) or would be unavailable to units transiting north-south from San Diego and would require additional transit.
- While not utilized for major training event anti-submarine warfare routinely, as the San Diego Arc is outside of W-291 where most major training events activities (except for major training event related mine warfare activities) occur, independent units do conduct unit level training activities in this area due to proximity to Naval Air Station North Island or opportunistically as submarines transit the area.

Activities utilizing explosives are very rare within the San Diego Arc:

- The San Diego Arc is outside of controlled airspace (W-291), therefore weapons firings is limited to small arms and crew service weapons conducted by ship/boat crews. These events typically involve non explosive rounds.
- Mine neutralization utilizes small explosive charges to disable or destroy targets. The introduction of the Littoral Combat Ship Mine Warfare mission module will include devices that contain explosives. Littoral Combat Ship crews will need to train in shallow water environments and will likely conduct explosive mine neutralization training in the Imperial Beach minefield, immediately adjacent to the San Diego Arc.
- Submarine launched devices that perform explosive mine neutralization may occur at the Advance Research Projects Agency Minefield. Restricting all use of explosives within the Arc would forfeit future ability to train with explosives within the minefield.

Naval vessels entering or leaving San Diego Bay routinely transit through and train within this area:

- Transiting to and from points north such as Camp Pendleton and Naval Weapons Station Seal Beach and Naval Base Ventura County, Port Hueneme.

- Submarines conducting intelligence, surveillance and reconnaissance training can occur here off San Diego.
- High value unit escort training can occur north to Camp Pendleton and throughout area.
- Vessels coming to/from San Diego North-South Block overlap area transiting to Silver Strand Training Range amphibious landing beaches.
- Navy Special Operations Command utilizes small boats (rigid hull inflatable boats (RHIBs) and zodiacs) to and from Silver Strand Range Complex and the Naval Amphibious Base.

The San Diego Arc is an important area for Navy testing for many of the same reasons it is important for training. For example, the San Diego Arc provides unique combination of bathymetric and oceanographic conditions as well infrastructure for command and control for autonomous vehicle testing with various Intelligence, Surveillance, and Reconnaissance payloads. Testing of systems and platforms intended for fleet use need to be tested in environments similar to those in which the Navy will both train and deploy.

K.4.1.6.2 San Diego (Arc) Blue Whale Feeding Area Mitigation Considerations

Smultea and Lomac-MacNair (2016) conducted 18 one-week-long aerial surveys spanning October 2008 through May 2013, resulting in 70 blue whale sightings composed of 117 individuals. The survey transects included the San Diego Arc feeding area and encountered the expected concentration of blue whales at that location consistent with the designation of the feeding area.

Given its close proximity to San Diego, a fleet concentration area for naval vessels and helicopters, and the high volume of ongoing training and testing activities occurring in waters within and just west of the arc, broad restrictions in this area for certain training and testing activities involving active acoustics sources or enforcing additional vessel transit measures, such as speed restrictions or restricting all hull-mounted mid-frequency active sonar year-round, would negatively impact the fleet's ability to deploy ready forces by

- denying ready access to established capabilities and unique geographic features;
- increasing the safety risk to sailors and systems by forcing events to occur further offshore and outside distances to which they could safely divert and requiring both surface and air platforms to train in an environment that is increasingly distant from land-based medical facilities and Search and Rescue (SAR) teams in the event of a training or testing mishap;
- creating inconsistency and artificiality as to how sailors develop skills, tactics, and techniques while training for deployment (potentially segmenting and interrupting the continuity of training events) if only certain training was allowed while others were restricted in the area; and
- inhibiting the ability to test platforms and systems in real world conditions that mimic those environments where these would be employed

Avoiding the area by relocating most activities is not likely to significantly reduce impacts on blue whale feeding behavior; the persistence of blue whales observed feeding in areas where the Navy has been conducting activities for long periods of time provides evidence that the Navy's activities have not caused blue whales to abandon or avoid that habitat (Calambokidis et al., 2015; Mate et al., 2016). And, while there is no evidence of adverse impacts to the population, predicted effects on individuals in the population are expected to be behavioral in response to Navy activities (see Appendix E, Estimated Marine Mammal and Sea Turtle Impacts from Exposure to Acoustic and Explosive Stressors Under Navy

Training and Testing Activities). Blue whale feeding behavior has been shown to be affected by sonar, vessel noise, and explosives. In these cases, blue whales resumed normal behavior quickly after the cessation of the exposure (Calambokidis et al., 2009c; Goldbogen et al., 2013b; Melcón et al., 2012). Evidence from tagged blue whales has indicated blue whale foraging is generally and widely dispersed across the offshore waters of Southern California (Mate et al., 2016).

Major anti-submarine warfare training exercises are not typically performed in the San Diego Arc. Most major training events occur further offshore and within W-291 and associated training areas. While the Navy does not routinely use this area for integrated anti-submarine major training exercises using surface ship hull-mounted mid-frequency active sonar, the Navy would, however, need to retain this capability in the event that the area is necessary for supporting integrated anti-submarine major training exercises using surface ship hull-mounted mid-frequency active sonar during blue whale feeding season.

The San Diego Feeding Area overlaps in part or fully, in some cases, with HSTT Settlement Areas 3-A through 3-C (Figure K.4-1). Under the settlement agreement, a condition within Settlement Areas 3-A and 3-B prohibits the use of hull-mounted mid-frequency active sonar for training and testing activities during major training events and unit-level training from June 1 through October 31.

A condition for Settlement Area 3-B requires implementing a seasonal Protective Measure Assessment Protocol measure from June 1 through October 31 advising Commanding Officers that the area is blue whale habitat and that they should avoid conducting system checks within the area whenever practicable. System Checks to ensure mid-frequency active acoustic sonar systems are functioning properly while getting underway have historically occurred within the San Diego Arc. These events must occur close to port; they cannot be deferred until the vessel is well out to sea for safety reasons. System checks are necessary to conduct as ships leave port to ensure that systems are operating effectively. Waiting until ships move farther from pier locations would mean they would then need to transit farther to return to the piers if systems were not working as intended, resulting in potential safety concerns, adding fuel costs and time, while delaying training and testing.

The Navy does not intend to fully carry forward the specific settlement agreement procedures discussed above. However, the Navy recognizes the importance of certain areas for foraging blue whales, particularly during certain times of the year, primarily June through October within the 200–400 m bathymetric region from the Mexico border to Point Conception, as observed in Calambokidis et al. (2015). Under typical oceanographic conditions, a strengthened southern flow of the California Current and associated coastal upwelling is a strong driver for increased prey concentration (i.e., krill) which supports opportunist blue whale foraging within the San Diego Arc Blue Whale Feeding Area. Therefore, the Navy proposes to implement mitigation areas within the San Diego Arc Blue Whale Feeding Area.

The Navy balanced the need for training and testing in the area with the biological importance of the area for blue whales and determined that establishing mitigation areas would likely reduce the number and level of impacts to this species without compromising military readiness. See Section K.2.2 (Mitigation Areas to be Implemented) for details on proposed mitigation areas.

One other temporary condition imposed in the Settlement Areas states the Navy shall require, from June 1 through October 31, that all surface vessels use extreme caution and proceed at safe speeds so they can take proper and effective action to avoid a collision with any sighted object or disturbance, and that the vessel can be stopped within a distance appropriate to the prevailing circumstances and conditions. The intention of this condition is to reduce Navy vessel strikes on whales. Navy regulations already require Navy vessels to operate at safe speeds to avoid collision with any object (including a

whale). Requiring Navy vessels to limit speeds to a pre-determined level would unacceptably impact mission readiness. As the likelihood of a Navy vessel striking a marine mammal is extremely low, the Navy will not implement mitigation that restricts vessel speed because Navy vessel operators need to learn to operate vessels as they would during military operations under an operational Commander). For some activities, vessels must maintain a certain speed to carry out the activity safely. For example, during flight operations, an aircraft carrier must maintain a certain wind speed over the deck to launch or recover aircraft. Depending on wind conditions, the aircraft carrier itself must travel at a certain speed to generate the wind required to launch or recover aircraft. Vessel speed restrictions would prevent vessel operators from gaining skill proficiency, would prevent the Navy from properly testing vessel capabilities (e.g., full power propulsion testing during sea trials), and could significantly increase the time and fuel it takes to reach training and testing locations; therefore, the mitigation would have significant impacts on the Navy's ability to train and test, and would prevent the Navy from meeting its training and testing requirements.

The Navy will implement issuing cautionary alerts such as seasonal notices informing vessels that certain species may be present in higher concentrations for feeding or may be migrating through an area may afford for a general heightened level of awareness throughout the entire Southern California portion of the HSTT Study Area, as discussed below.

K.4.1.7 Blue Whale Feeding Area Mitigation Assessment

Four of nine feeding areas for blue whales identified by Calambokidis et al. (2015b) along the U.S. West Coast overlap (two wholly and two partially) the Southern California portion of the HSTT Study Area in July through October. Navy training and testing activities that use sonar and other transducers could occur year-round within the Study Area although are concentrated on Navy ranges; however, these four feeding areas make up a very small portion of the Study Area and animals in those areas will always likely experience exposure to some sonar from propagation from units well outside of the feeding area.

Training and testing activities rely heavily on areas within the Southern California portion of the HSTT Study Area because of their proximity to Naval Base San Diego, Naval Air Station North Island, Naval Base Point Loma, and Marine Corps Base Camp Pendleton; proximity to established ranges such as the Southern California Anti-Submarine Warfare Range, Tactical Maneuvering Areas, minefields; and shallow, near shore bathymetry. Avoiding the blue whale feeding areas by relocating activities is not likely to significantly reduce impacts on blue whale feeding behavior given that research indicates that observed feeding blue whales persisting in areas where the Navy have been conducting activities for long periods of time provides evidence that the Navy's activities have not caused blue whales to abandon or avoid that habitat (Calambokidis et al., 2015; Mate et al., 2016).

Furthermore, the dynamic presence or absence of prey in any one area and the associated response of blue whales to prey location, the seasonal avoidance of a statically bounded Blue Whale Feeding Area may not reflect the actual presence of feeding blue whales at any specific time. As a result, time-area avoidance mitigation may not account for the short-term dynamic presence or absence of species such as blue whales and may be unlikely to be effective at reducing impacts. On the day of training or testing event, when environmental conditions are different than the aggregate averaged conditions used in delimiting a biologically important area, avoidance of the area could inadvertently shift the Navy event exposures to locations outside the designated biologically important area and into areas where blue whales happen to be feeding. To account for the dynamic and variable presence of prey and feeding blue whales in the Southern California Range Complex, the most effective mitigation measures are those

based on the immediate and actual detected presence of the species in the location where an event will be taking place or while it is occurring, as currently implemented in accordance with Navy established procedural mitigation measures.

While the Navy will continue to implement procedural mitigation measures that account for actual detected presence of blue whales in the location where an event will be taking place or while it is occurring, the Navy also recognizes some areas within the Southern California portion of the HSTT Study Area as areas where concentrations of blue whales have been detected and feeding behavior has been observed (Calambokidis et al., 2015), such as the San Diego (Arc) Blue Whale Feeding Area. This area due to typical oceanographic conditions resulting in coastal upwelling that increases phytoplankton nutrients as a strong driver for increased prey concentration (i.e., krill) is more likely to support opportunist blue whale foraging. The Navy determined that by establishing the following proposed mitigation areas, there was the potential to further avoid or reduce the number and level of impacts to feeding blue whales and other species or stocks occurring within the biologically important area without compromising military readiness by reducing the effectiveness of training and testing or decreasing the safety of personnel:

1. The Navy proposes to establish three mitigation areas (Figure K.2-1) where the Navy would limit the amount of surface ship hull-mounted, mid-frequency active sonar used per season from June 1 through October 31. The Navy would not exceed 200 hours of combined MF1 use in the San Diego Arc, Santa Monica/Long Beach, and San Nicolas Island Mitigation Areas.
2. The Navy would not use explosives used in gunnery (lg. caliber), torpedo, bombing, and missile exercises (including 2.75-inch rockets) during testing, unit-level training and major training exercises in the San Diego Arc or Santa Monica/Long Beach Mitigation Areas (Figure K.2-1) from June 1 to October 31. In addition, the Navy would not use explosives used in gunnery (lg. caliber), torpedo, bombing, and missile exercises (including 2.75-inch rockets) during unit-level training and major training exercises in the San Nicolas Island Mitigation Area (does not apply to testing events).

There is no evidence of adverse impacts to the population and predicted effects on individuals in the population are expected to be behavioral in response to Navy activities (see Appendix E, Estimated Marine Mammal and Sea Turtle Impacts from Exposure to Acoustic and Explosive Stressors Under Navy Training and Testing Activities) conducted within the Tanner-Cortes Bank Blue Whale Feeding Area. Establishing any additional mitigation areas within other Blue Whale Feeding Areas other than those proposed above and discussed in Section K.2.2 (Mitigation Areas to be Implemented) would either be impracticable to implement as they are adjacent to or within areas of high use and provide critical infrastructure or environmental conditions that are not easily replicated elsewhere, or are areas identified as low use by the Navy and adverse impacts to the feeding blue whales are not anticipated. Merely shifting the impacts on blue whales from the feeding areas to another area in relation would not necessarily be any more effective in reducing impacts. Over an annual or even seasonal basis, blue whales for instance integrate (i.e., forage, transit) the entire Southern California portion of the HSTT Study Area as documented in four years of tagging data as discussed in Sections K.4.1.1 (General Biological Assessment) and K.4.1.5 (Tanner-Cortes Bank Blue Whale Feeding Area, Settlement Area 4-C). Blue whales occur year-round throughout the Study Area.

The Tanner-Cortes Bank Feeding Area overlaps with strategically important training and testing areas the Navy has been using for over 40 years. For reasons noted below, implementing geographic or temporal mitigation measures would not be practicable to implement due to the areas unique and irreplaceable training capability for unit level through Strike Group training and certification in the Southern California Range Complex.

The complex bathymetry of Tanner-Cortes Bank, off shore shallow/very shallow areas proximate to steep gradients and very deep waters create a challenging acoustic environment and are not found elsewhere in the Southern California offshore region (Figure K.4-1). Tanner-Cortes Bank replicates many of the areas where our sailors will be called upon to serve, protecting freedom of navigation while defending against ultra-quiet diesel electric submarines.

The bathymetry provides submarine commanders a complex seascape in which they can sharpen their skills of maintaining stealth while achieving mission goals. Conversely, surface ships, aircrews, and submarines benefit from this same challenging sea space to sharpen their skills in utilizing all of the tools available to them, including mid-frequency active sonar to detect, locate, track, and prosecute submarine threats.

While blue whale feeding behavior has been shown to be affected by sonar, vessel noise, and explosives, blue whales resumed normal behavior quickly after the cessation of the exposure (Calambokidis et al., 2009c; Goldbogen et al., 2013b; Melcón et al., 2012). Furthermore, evidence from tagged blue whales has indicated blue whale foraging is generally and widely dispersed across the offshore waters of Southern California (Mate et al., 2016) and it is unlikely that blue whales are always feeding in the most optimal location. Blue whales are highly mobile, feed over large ranges and forage in bouts separated by many kilometers, with disturbed blue whales temporarily move to alternative foraging sites in the interim. Navy research and monitoring funding and the new science it supports continues within the HSTT Study Area under current NMFS MMPA and ESA permits, and is planned through the duration of any future permits.

The San Nicolas Island and Santa Monica Bay to Long Beach Blue Whale Feeding Area and California Coastal Commission 3 NM Shore Area are not part of the primary training areas within the Southern California portion of the HSTT Study Area. Given this, geographic mitigation measures would not be effective in reducing adverse impacts given these areas are not generally used in training involving sonar, explosives, or airguns.

Navy vessel strikes on whales are rare (see details presented in Appendix F, Military Expended Material and Direct Strike Impact Analyses) and none have occurred in the Blue Whale Feeding Areas or the area defined through negotiations with the California Coastal Commission. The measure simply restates the vigilance a ship's crew already applies to avoid a collision with any object (including a whale); there are no additional procedural measures or enhancements to existing procedures that would further reduce the potential for a vessel strike. Requiring Navy vessels to limit speeds to a pre-determined level would unacceptably impact mission readiness.

Furthermore, existing protection measures have been very effective in mitigating the potential for ship strikes both within the San Diego Arc as well as worldwide. All surface vessels use extreme caution and proceed at safe speeds so they can take proper and effective action to avoid a collision with any sighted object or disturbance, and that the vessel can be stopped within a distance appropriate to the prevailing circumstances and conditions. Unlike commercial vessels, Navy vessels are uniquely suited to detect marine mammals (forward bridge, dedicated lookouts) and are more likely to avoid strikes (highly

maneuverable) and Navy sailors receive training specifically intended to sharpen their ability to sight marine mammals. Accordingly, ship strikes by naval vessels are exceedingly rare events. There has never been a Navy ship strike to blue whales or any other large whale species within the San Diego Arc. Seasonal restrictions/limitations on vessel speed would unnecessarily complicate the Navy's ability to conduct routine activities and would prevent vessel commanders from operating as necessary to ensure safety of navigation.

Implementing the Navy's Marine Species Awareness Training, beginning in 2006, along with other existing Navy mitigation measures intended to ensure that vessels avoid whales, correlates well with the reduction of strikes on large whales by Navy vessels in the last decade. All Navy vessels already use extreme caution and proceed at a safe speed so they can take proper and effective action to avoid a collision with any sighted object or disturbance as standard operating procedures in addition to mitigation measures described in Chapter 5 (Mitigation) to limit the interaction between Navy vessels and marine mammals, further reducing the potential for disturbance and direct strike to Mysticetes.

As discussed in Section 3.0.3.3.4.1 (Vessels and In-Water Devices), large Navy ships typically operate at average speeds of between 10 and 15 knots, which for reference is slower than large commercial vessels, such as container ships that steam at approximately 24 knots during normal operations (Maloni et al., 2013). Operating vessels at speeds that are not optimal for fuel conservation or mission requirements would be unsustainable due to increased time on station and increased fuel consumption. Each ship has a limited amount of time that it can be underway based on target service requirements and ship schedules. Ship schedules are driven largely by training cycles, scheduled maintenance periods, certification schedules, and deployment requirements. Because of the complex logistical considerations involved with maintaining ship schedules, the Navy does not have the flexibility to extend the amount of time that ships are underway, which would result from vessel speed restriction mitigation. If the Navy were to incorporate vessel speed restrictions into event planning for approximately 3–6 months out of the year, ships would be unable to meet all of their requirements during their limited time available to be underway. This would hold true even if the restrictions only applied to transits to and from training or testing event locations and not during the events themselves. Therefore, it would not be practicable for the Navy to implement speed restrictions within the biologically important areas.

As described in Section 5.3.4.1 (Vessel Movement), additional vessel speed restrictions would prevent vessel operators from gaining handling proficiency, would prevent the Navy from properly testing vessel capabilities, and would increase required the time on station during training or testing events to build skill proficiency or properly test vessel capabilities (which would significantly increase fuel consumption); therefore, the proposed mitigation would have significant impacts on the Navy's ability to train and test, and would prevent the Navy from meeting its mission requirements.

As mentioned above, issuing cautionary alerts such as seasonal notices informing vessels that certain species may be present in higher concentrations for feeding or may be migrating through an area may afford for a general heightened level of awareness. This measure is likely to be effective in reducing behavioral impacts or vessel strikes on marine mammal species or stocks not only within a delimited biologically important feeding area but also in the surrounding region where the behavior is also likely to occur and would be practical to implement without reducing the effectiveness of the military readiness activity or compromising personnel safety. The Navy proposes to issue seasonal large whale awareness notification messages to remind ships and aircraft to maintain extra vigilance during transit and to maintain safe speeds commensurate with operational timelines, training requirements, or logistic needs, and for safety of navigation to avoid interactions with large whales that may be vulnerable to vessel

strikes, especially during seasonal, large concentrations of blue whales in the near shore area out to 20 NM from the Southern California mainland from June to October, see Section K.2.3.4 (Awareness Notification Messages) for more details.

K.4.2 Gray Whale Migration and Potential Presence Areas

Calambokidis et al. (2015) identified a gray whale migration area off Southern California and overlapping with all the Southern California portion of the HSTT Study Area north of the border with Mexico (Figure K.4-6). This migration area covers approximately 22,300 km^2 of water space within the HSTT Study Area. In the vicinity of San Nicolas Island and San Clemente Island, this migration area's western boundary is located up to 150 km from mainland shoreline, which is farther offshore and to the west of the HSTT Study Area boundary. As a result, all of the Southern California portion of the HSTT Study Area that is north of the U.S.–Mexico border has been designated as a migration area or a potential presence area for gray whales during 10 months of the year (October through July).

The migration area and potential presence area overlap with the provisional Settlement Areas 3-A through 3-C, Settlement Areas 4-A through 4-D, California Coastal Commission 3 NM Area, California Coastal Commission Channel Island Area, California Coastal Commission San Diego Arc, the portion of the Channel Islands National Marine Sanctuary within the Southern California portion of the HSTT Study Area, and two areas identified during the scoping process. Discussion of these overlapping areas is presented in Section K.1.1.2 (Provisional 2015 Prohibited or Restricted Areas within HSTT Study Area), Section K.1.1.3 (Areas Identified by the California Coastal Commission), and K.1.1.4 (Areas Identified During the NEPA Public Involvement Process).

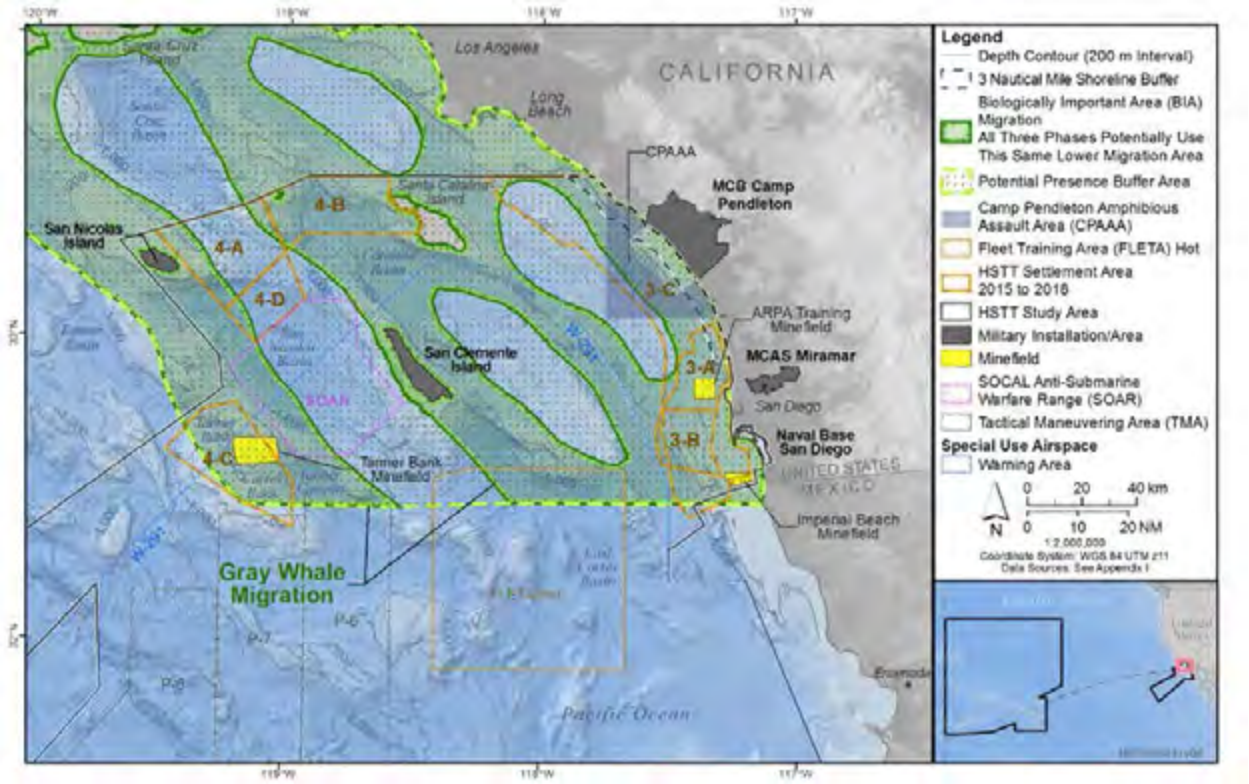


Figure K.4-6: Gray Whale Migration Area off the Southern California Coast

Notes: MCB = Marine Corps Base; MCAS = Marine Corps Air Station

K.4.2.1 General Biological Assessment

For a thorough description of the gray whale species, see Section 3.7.2.3.4, (Gray Whale [*Eschrichtius robustus*]; Eastern North Pacific Stock) and Section 3.7.2.2.5 (Gray Whale [*Eschrichtius robustus*]; Western North Pacific stock). The Western subpopulation is listed as endangered under the ESA. The Eastern North Pacific stock (also known as the eastern north Pacific or the California-Chukchi population) appears to have recovered from exploitation and was removed from listing under the ESA in 1994 (Swartz et al., 2006).

Most gray whales occurring along the U.S. West Coast are from the Eastern subpopulation, with only a few individuals from the Western subpopulation thought to migrate along the coast to Mexico. In general, gray whales found along the west coast of North America migrate annually from their winter breeding grounds in nearshore Mexican waters to their summer feeding grounds off northern California, Oregon, Washington, Canada, and Arctic waters including the Okhotsk Sea off the coast of Russia's Sakhalin Island (for additional details see Section 3.7.2.2.5.2, Habitat and Geographic Range).

Given the importance of the gray whale migration behavior to the species, areas along the U.S. west coast were deemed to be biologically important for gray whale migration and were designated as such to help inform regulatory and management decisions and to minimize the impacts of anthropogenic activities on gray whale migration (Calambokidis et al., 2015; Ferguson et al., 2015b). As presented by Calambokidis et al. (2015) the spatial and temporal parameters of the gray whale migratory corridor along the U.S. west coast (including Alaska and Canada) are relatively well defined based on tagging studies, dedicated line-transect ship and aerial surveys for marine mammals, land-based counts, and observations from whale-watching operations and recreational and commercial fishermen. The timing of the migration and the routes these gray whales take have been described as the "Southbound Phase," "Northbound Phase A," and "Northbound Phase B" and are shown Calambokidis et al. (2015). Each of the three migration area corridors also include an additional migration area potential presence buffer that extends 47 km from the U.S. west coast (Calambokidis et al., 2015). The gray whale migration corridors (Southbound, Northbound Phase A, Northbound Phase B, and the potential presence area) are cumulatively in use from October through July (Calambokidis et al., 2015; Ferguson et al., 2015b), 10 months annually spanning the entire U.S. west coast. The timing of migration along U.S. coast and when the whales are present in the lower migration area that overlaps with the HSTT Study Area is variable, and the three phases are not always distinct, with factors such as climate change and the amount of sea ice cover in northern latitudes influencing migration periods (Calambokidis et al., 2015; Salvadeo et al., 2015).

K.4.2.1.1 Biological Considerations Applicable to the Gray Whale Migration Area

The Gray Whale Migration Area (Calambokidis et al., 2015) overlapping with the Southern California portion of the HSTT Study Area are shown on Figure K.4-6. Characterizing the gray whale migration distance from the U.S. west coast, Bonnell and Dailey (1993) concluded that "about one-half" of all sightings occur within 15 km of the coast while Calambokidis et al. (2015) provide that "most gray whales" migrate within 10 km of the coast. This characterization and the designated separate migration corridors associated with phases of migration along the U.S. West Coast do not, however, apply to the ocean area consisting of the Southern California Bight south of Point Conception, which includes the Southern California portion of the HSTT Study Area. Gray whales have been observed migrating through the offshore portion of the Southern California Bight as far as 200 km offshore (Bonnell & Dailey, 1993) and far to the west of San Nicolas Island and San Clemente Island (Carretta et al., 2000; Jefferson et al., 2014; Sumich & Show, 2011). Calambokidis et al. (2015) cite Bonnell and Dailey (1993) for the Southern

California Bight portion of the Identified migration area, which described the migration "pathway" in the Southern California portion of the HSTT Study Area as "broad and rather diffuse." Sumich and Show (2011) note substantial year-to-year variability in the use of migration corridors in the Southern California Bight. Sumich and Show (2011) also report on unpublished data indicating "about 24 percent" of migrating gray whales use a nearshore migration route and indicated their survey results suggested an offshore preference by larger, presumably older whales, leaving fewer and apparently younger whales using that nearshore migration route.

As presented in Calambokidis et al. (2015) on Figure K.4-6. for the identified gray whale migration corridor, all three phases of migration "potentially use this lower migration area." In the vicinity of San Nicolas Island and San Clemente Island, this lower migration area's western boundary is located approximately up to 150 km from mainland shoreline, which is farther offshore and to the west of the HSTT Study Area boundary. All the water space between the lower migration area's corridors in Southern California portion of the HSTT Study Area are otherwise covered by the potential presence buffer area. As a result, all the Southern California portion of the HSTT Study Area that is north of the U.S./Mexico border has been designated by NMFS as a migration area for gray whales during 10 months of the year (October through July).

While the Identified migration area has a southern boundary ending at a line drawn seaward from the border with Mexico, Navy recognizes that gray migration routes extend beyond the currently identified areas and continue on outside of the U.S. Exclusive Economic Zone (Aquatic Mammals, 2015a, 2015b, 2015c; Ferguson et al., 2015b; Van Parijs et al., 2015) regarding the limits to the designated biologically important areas. Survey data indicates that whales passing San Clemente Island head southeast in the direction of the mainland shore of Baja California in Mexican waters (Bonnell & Dailey, 1993; Sumich & Show, 2011). For the offshore migration corridors, Sumich and Show (2011) note substantial year-to-year variability between the number of whales using the offshore Santa Catalina corridor and the San Clemente corridor. Information provided by De Jesus et al. (2014) for waters off Ensenada, Mexico (approximately 40 NM south of the U.S./Mexico border) indicated the migration corridor extending beyond 20 km (during very limited sampling, gray whales were observed at 22 km) from the coast but that most gray whales traveled within approximately 10 km of the shore. Although this suggests the migration corridor south of the border may be narrowing down from approximately 150 km in width to the south of San Clemente Island to as broad as 22 km in width at Ensenada, this is insufficient information to accurately determine where a representative migration corridor would be drawn. The migration areas were intended to be defined as "areas and times within a substantial portion of a species is known to migrate; the corridor is spatially restricted," (Ferguson et al., 2015b; Van Parijs, 2015). Since sufficient information is not known and a migration corridor has not been designated for waters south of the U.S./Mexico border within the Southern California portion of the HSTT Study Area, given the broad and rather diffuse lower migration area at the border lacking any spatially restriction, the year-to-year variability in the use of the corridors to the north, and absent any science to support further speculation, Navy cannot assume to create a spatially restricted corridor reflecting the areas and times within which a substantial portion of gray whales may migrate when south of the border.

For the gray whale migration corridors along the U.S. west coast, southbound whales are expected from October–March, northbound Phase A from January to July (peaking April–July), northbound Phase B from March–July, and the potential presence during the cumulative October-July period (Calambokidis et al., 2015). Bonnell and Dailey (1993) report that gray whales are not present in the Southern California Bight from August through November. More recent aerial surveys have encountered gray

whales in the Southern California portion of the Study Area as early as January (Carretta et al., 2000; Graham & Saunders, 2015; Smultea, 2014) and as late as June (Graham & Saunders, 2015). Passive acoustic monitoring in offshore sites within the Southern California Range Complex portion of the HSTT Study Area have detected gray whale calls in the months of December through May (Debich et al., 2015a; Hildebrand et al., 2011). Monitoring in waters off Ensenada, Mexico indicate gray whales are present migrating south from the beginning of December and overlapping (in February and March) with the start of the northbound migration in which ends in the third week of May (De Jesus et al., 2014). The National Oceanic and Atmospheric Administration's website containing data records for marine mammals from the Cetacean Density and Distribution Mapping Working Group (see Ferguson et al. (2015b)) shows the recorded presence of gray whales in the Southern California Bight in every month of the year except June, October and November. As a result of the Cetacean Density and Distribution Mapping Working Group records and area specific findings, Navy assumes that gray whales could be migrating through the Southern California portion of the HSTT Study Area between the months of December through September; 10 months of the year.

K.4.2.1.2 Stressor Analysis

K.4.2.1.2.1 Sonar and Other Transducers

Sonar and active acoustic transducers create underwater non impulsive energy potentially impacting gray whales and their migration behavior.

Quantitative modeling of acoustic effects as detailed in Section 3.7.3.1.2 (Impacts from Sonar and Other Transducers), estimates behavioral effects and TTS to gray whales, with very few PTS estimated for this species from exposure to sonar and other transducers. Behavioral reactions are unlikely to rise to the level of significant under NEPA nor would they be sustained for a duration long enough that it caused an animal to be outside of normal daily variations in feeding, reproduction, resting, migration/movement, or social cohesion. Any TTS in the biologically important areas would be minor to moderate, from which the individual whale would fully recover quickly. This assessment is based on a general short-term presence of any individual gray whale within the Southern California portion of the HSTT Study Area as the animal migrates back and forth from North Pacific or Arctic waters to Mexico. Any PTS is limited to a couple individuals, causing residual hearing loss with minor long-term consequences for an individual; however, it is unlikely to have any long-term consequences for the species or stocks.

Any exposure to sonar and other transducers would be highly infrequent given the small number of surface ships with hull-mounted sonar systems homeported in the HSTT Study Area. Furthermore, multiple years of Navy-funded passive acoustic monitoring (Debich et al., 2014) has documented low encounter rates between these vessels and marine mammals.

Villegas-Amtmann et al. (2015) have noted that there are no significant energetic costs associated with gray whale migration, but speculate that disturbance along the migratory corridor due to increased human activities might increase migration costs. Navy assumes that such a disturbance along the migration corridor would have to be sustained over a long period or dramatically alter the migration path of a whale to have other than a negligible effect on a gray whale's energy reserves, given they are sufficient for a migration that may cover as much as approximately 10,000 km over about two months.

In addition to potential masking of distant Navy sound sources by commercial vessel transit noise, the Navy's stand-off distance of 500 yards (457 m) and mitigation procedures (see Chapter 5, Mitigation, for details) are likely to further reduce the potential for any significant impact on gray whale migration should those animals be present and detected during a Navy training or testing activity.

Additionally, the same hull-mounted active sonar systems present on ships homeported in the HSTT Study Area and elsewhere have been in common use for over 40 years. Gray whales have been migrating directly through the Southern California portion of the HSTT Study Area twice a year during the past 40 years and there has been no evidence of any disruption to gray whale migration caused by Navy training and testing activities. Additionally and during that time, gray whales in the Eastern North Pacific Stock have recovered to the point where they are no longer listed under the ESA. In short, there has been no evidence to suggest any effect, let alone any significant impact, to gray whale migration activity resulting from decades of Navy training and testing in Southern California involving the involving the use of sonar and other transducers. Reducing or avoiding use of active sonar and other transducers in the Southern California portion of the HSTT Study Area that is north of the U.S/Mexico border (the identified migration area) or reducing use during the December through September (10 months of the year) timeframe when gray whales may be present in that area, would not be effective at further reducing impacts given the absence of any known science demonstrating an impact on gray whale migration activity from these acoustic stressors. In short, gray whale reactions to sonar are most likely to be short-term and mild to moderate. Therefore, significant impacts to gray whale migration behaviors from training with sonar and other transducers are unlikely to occur within the gray whale migration area.

K.4.2.1.2.2 Explosives

Quantitative modeling of acoustic effects detailed in Section 3.7.3.2.2 (Impacts from Explosives) estimates there may be TTS and a few PTS exposures to gray whales. Any TTS in the biologically important areas would be minor to moderate, from which the individual whale would fully recover quickly. PTS would be limited to a couple individuals, causing residual hearing loss with minor long-term consequences for an individual; however, it is unlikely to have any long-term consequences for the species or stocks. In the Southern California portion of the Study Area that overlaps with the gray whale migration area there should, however, be no significant impact to gray whale populations from these explosive stressors. This assessment is based on the following: a general short-term presence of any individual gray whale within the Southern California Range Complex portion of the HSTT Study Area as the animal migrates back and forth from North Pacific or Arctic waters to Mexico; any exposure to an explosive stressor would be highly infrequent as documented from multiple years of Navy-funded passive acoustic monitoring (Debich et al., 2014); variable individual unit level training schedules with prolonged periods of absence at sea between successive events; and the implementation of Navy mitigation measures for marine mammals sighted within prescribed mitigation zones from the location of the explosive stressor. See Chapter 5 (Mitigation) for details on mitigation measures already in place.

K.4.2.1.2.3 Vessel Strike

Vessel strikes have been documented for almost all of the mysticetes (Van der Hoop et al., 2015), including gray whales (Laist et al., 2001). Most training activities and many testing activities involve the use of vessels. Vessel strikes to marine mammals have not been associated with any specific training or testing activity in the past but were rather a limited, sporadic, and accidental result of Navy vessel movements within the HSTT Study Area. Vessel movements can be widely dispersed throughout the HSTT Study Area but are concentrated near Naval Base San Diego; Silver Strand Training Complex; and Pearl Harbor, HI. Refer to Section 3.0.3.3.4.1 (Vessels and In-Water Devices) for the estimated vessel use by range complex.

There would be a higher likelihood of vessel strikes over sections of the continental shelf in the Southern California portion of the HSTT Study Area than in the Hawaii or transit corridor because of a higher

concentration of vessel traffic and higher densities of some marine mammal species off Southern California. No predictable seasonal variation in Navy vessel traffic is expected; therefore, impacts from vessels, including physical disturbance and potential for strike, would depend on gray whale migration patterns in the Southern California portion of the HSTT Study Area. As indicated any physical disturbance from vessel transit is not expected to result in more than a momentary behavioral response.

K.4.2.1.2.4 Air Guns

No training activities use air guns. As discussed in Section 3.7.3.1.3 (Impacts from Air Guns), testing activities would include the use of single air guns in the Southern California portion of the HSTT Study Area. Single, small air guns are not capable of injuring marine mammals. Marine mammals engaged in activities such as migrating may be more likely to ignore or tolerate potential disturbance created by air gun use and continue their natural behavior patterns. Because noise from air gun activities is short-term and intermittent, it is unlikely that a marine mammal would be exposed to noise that would result in any more than a short-term and mild to moderate behavioral responses. Acoustic modeling predicts one gray whale behavioral reaction annually from the use of air guns during testing in the Southern California portion of the HSTT Study Area. It is unlikely that air gun noise would affect the migration behaviors of gray whales beyond short-term, minor behavioral responses.

K.4.2.1.3 Navy Requirements for Area-Specific Training and Testing

The portion of the Gray Whale Migration and Potential Presence Area within the HSTT Study Area extends over 100 mi. from the coastline and encompasses every primary training site within the Southern California portion of the HSTT Study Area. Spatially, migrating Gray whales may be present anywhere within Southern California. Temporally, Gray whales may be present most of the year, migrating north January through July and south October through March. While not illustrated or addressed in Ferguson et al. (2015b) it can also be assumed that these migration routes extend south of the U.S. border with Mexico regarding the geographic limits to the biologically important areas identification effort.

The training areas encompassed by the Gray whale area provide critical capabilities necessary to train naval forces. They include the following: the instrumented Southern California Anti-submarine Warfare Range; established helicopter sonar dipping areas, proximate to Naval Air Station North Island; Tanner Cortes Bank; a sonobuoy test area; three minefields; the Camp Pendleton Amphibious Assault Area; and other complex bathymetric features necessary to challenge anti-submarine skills. Further south of the U.S. border, the migration route overlaps the Tactical Maneuvering Areas and Missile Range Areas, given that the gray whales continue on these migration routes to their Baja California calving areas and return within the same areas.

The waters offshore of Southern California have supported naval training and testing for decades and are used almost daily by naval forces to conduct all phases of training, from basic unit level events to complex major training exercises. Navy readiness depends on access to the training areas in close proximity to Fleet concentration areas.

As discussed above in Section K.4.2.1.1 (Biological Considerations Applicable to all Gray Whale Migration Areas), gray whales are may be present in the Southern California portion of the HSTT Study Area during a 10-month timeframe (December through September). In addition, the migration area covers a significant portion of the Southern California portion of the Study Area. The Navy cannot avoid or reduce the use of the entire Southern California portion of the Study Area, nor over the entire 10-month time from without severely impacting military readiness activities across this portion of the Study Area. The

Navy's operating tempo is designed to balance with each unit's maintenance, material readiness, testing, and training with operational requirements. The scheduling of training and testing events in the HSTT Study Area are designed to maintain stability in cycles of training, testing, and maintenance in order to meet global force management presence requirements set forth by Congress while also complying with the statute (10 United States Code §991) mandating that military personnel are not deployed, or continued in a deployment, in excess of certain thresholds. As a result, deployment cycles drive timing of all certification training and major training exercises and are not coupled to specific time periods over an annual cycle. In a similar manner, the testing schedules are driven by a number of factors including system development requirements, system upgrade timing, funding cycles, and additional factors which drive variable scheduling across any given year.

Given the operating tempo requirements for maintaining continual cycles of training and testing in the Southern California portion of the Study Area, rescheduling activities outside of the 10 months of the gray whale migration or reducing the number of training or testing activities during that migration season would not allow Navy to meet its readiness requirements. Similarly, Navy offshore instrumented ranges are typically used and scheduled for most of the year. There are no alternative instrumented ranges in the Southern California Range Complex and there is insufficient excess capacity to avoid or reschedule training and testing cycles at these locations to occur outside the 10-months of the year when gray whales are migrating through the area.

K.4.2.2 Gray Whale Migration Area Geographic Mitigation Assessment

As discussed in Section 3.7.3.1 (Acoustic Stressors), acoustic effects modeling indicates that exposure to acoustic stressors (sonar and other transducers, and airguns) or exposure to explosive stressors is not likely to significantly impact the migration of gray whales. Scientific data does not support a conclusion that significant impacts on gray whale migratory behavior are occurring from Navy activities, therefore halting, reducing, or otherwise limiting the use of sonar and other transducers in the area when gray whales may be generally present would not be effective at reducing impacts on gray whale migration. Navy training and testing require the use of the Southern California portion of the HSTT Study Area throughout the year. Restricting use of that area when gray whales are present would have significant impacts on the Navy mission and readiness requirements. Geographic mitigation would not be effective at reducing significant impacts on gray whale migration within the Southern California portion of the HSTT Study Area since none are occurring regardless of implementing mitigation. No additional mitigation requirements are reasonable or practicable given the absence of significant impacts on gray whale migration behavior in this area and considering the impact these requirements would have on the Navy's mission and readiness requirements.

There are no indications that Navy activities would significantly affect the migration behavior of individuals, which was the purpose for the designation of the biologically important area. The gray whale migration area covers the entire Southern California portion of the HSTT Study Area north of the border with Mexico during a 10-month timeframe (December through September). The Navy cannot avoid or reduce the use of this large portion of Southern California waters without significant impact on Navy readiness and mitigation measures for that area would not be effective at reducing adverse impacts to the gray whale population.

While gray whales are reported to be one of the most commonly struck species in California (National Marine Fisheries Service, unpublished data), there have been no known Navy ship strikes to gray whales in over 15 years. Implementing the Navy's Marine Species Awareness Training in 2006, along with other

existing Navy mitigation measures intended to ensure that vessels avoid whales, is likely responsible for the reduction of strikes to large whales by Navy vessels in the last decade. Existing protection measures have been very effective in mitigating the potential for ship strikes both within the Southern California portion of the Study Area as well as worldwide. All surface vessels use extreme caution and proceed at safe speeds so they can take proper and effective action to avoid a collision with any sighted object or disturbance, and so that the vessel can be stopped within a distance appropriate to the prevailing circumstances and conditions. Unlike commercial vessels, Navy vessels are uniquely suited to detect marine mammals (forward bridge, dedicated lookouts) and are more likely to avoid strikes (highly maneuverable) and Navy sailors receive training specifically intended to sharpen their ability to sight marine mammals. Accordingly, ship strikes by naval vessels are exceedingly rare events. Seasonal restrictions/limitations on vessel speed would unnecessarily complicate the Navy's ability to conduct routine activities and would prevent vessel commanders from operating as necessary to ensure safety of navigation.

Issuing cautionary alerts, such as seasonal notices informing vessels that certain species may be present in higher concentrations and may be migrating through an area, may afford for a general heightened level of awareness. This measure is likely to be effective in reducing behavioral impacts on marine mammal species or stocks not only within a delimited biologically important feeding area but also in the surrounding region where the behavior is also likely to occur. Furthermore, this measure is likely to be effective where it is most practical to implement without reducing the effectiveness of the military readiness activity or compromising personnel safety. The Navy proposes to issue seasonal large whale awareness notification messages to remind ships and aircraft to maintain extra vigilance during transit and to maintain safe speeds commensurate with operational timelines, training requirements, or logistic needs, and for safety of navigation to avoid interactions with gray whales that may be vulnerable to vessel strikes, especially during seasonal migration in the near shore area out to 10 NM from the Southern California mainland from November to March, see K.2.3.4 (Awareness Notification Messages).

K.5 Provisional 2015 Prohibited or Restricted Areas within HSTT Study Area

As discussed above in Section K.1.1.2, the Navy agreed to certain temporary prohibitions or restrictions for some activities within the HSTT Study Area as a result of a settlement agreement and order signed in 2015. Many of these settlement areas overlap with biologically important areas for certain species' behavior to some extent, as discussed in Sections K.3 and K.4. Where there is overlap between these settlement areas and an area which was designated as biologically important for certain species' behavior, they are discussed and assessed above within the biologically important area assessment in which they overlap in order to reduce any redundancies and to provide context of the settlement areas when applicable. For prohibited or restricted areas within the HSTT Study Area that do not overlap with the biologically important areas assessed above in Sections K.3 and K.4, those area assessments are addressed separately below in this section.

K.5.1 Settlement Areas Within the Hawaii Portion of the HSTT Study Area

Within the HSTT Study Area there are 16 locations (9 in Hawaii and 7 in Southern California) established as part of a 2015 settlement agreement and are analyzed and considered for their effectiveness in further reducing or avoiding environmental impacts to the species/stock or its habitat from a biological standpoint and are practicable to continue implementing.

As noted previously and under the terms of the settlement agreement in September 2015, the Navy agreed to prohibit or restrict certain hull-mounted active sonar and underwater explosives use and implement other operational requirements within defined areas in Hawaii during training and testing. These measures from the agreement were provisional until the December 24, 2018 expiration of the current HSTT MMPA Final Rule or the issuance of any superseding environmental compliance documents before that expiration date. These provisional settlement measures therefore form part of the baseline environmental conditions that exist within the Hawaii portion of the HSTT Study Area. To understand the restrictions and prohibitions on activities incorporated into the settlement agreement, it is necessary to review the following set of definitions that apply to the terms of the agreement:

- "In-Water Explosive" means a weapon containing an explosive-filled warhead or demolition charge purposefully detonated below the water's surface. This definition specifically excludes devices employing explosives with 5 lb. net explosive weight or less for non-weapon functions such as launch or ejection, or to actuate or perform internal functions.
- "Mid-Frequency Active Sonar" means hull-mounted, mid-frequency active sonar (a sonar source producing signals from 1 to 10 kHz) on Navy surface vessels.
- "Military Training Exercise" means a coordinated or strike group major training exercise that, for purposes of the Settlement Agreement, consists of: Integrated Anti-Submarine Warfare Course, Composite Training Unit Exercise, Joint Task Force Exercise, Sustainment Exercise; Undersea Warfare Exercise; Independent Deployer Certification Exercise; and Rim of the Pacific Exercise. Military training exercises include Unit-Level Training that may be conducted by military training exercise participants when an military exercise training is ongoing.
- "System Checks" means the non-tactical use of mid-frequency active sonar for pre-operational testing, preventive or corrective maintenance, and during inspections by the Board of Inspection and Survey.
- "Unit-Level Training" means single surface vessel training, or a combination of surface vessels and submarines or aircraft training, with the use of surface ship mid-frequency active sonar.

K.5.2 Settlement Areas Within the Hawaii Portion of the HSTT Study Area

Within the Hawaii portion of the HSTT Study Area there are nine locations that were part of the provisional settlement agreement as noted in the following sections. References to other sections of this appendix are provided where geographic overlap occurs between the settlement area and a previously described biologically important area. Table K.1-1 also indicates which biologically important areas overlap spatially with settlement areas.

The nine settlement areas subdivided into five areas surrounding the Island of Hawaii: 1-A, 1-B, 1-C, 1-D, and 1-E, and four areas located between the islands of Maui, Lanai, and Molokai (Figure K.5-1).

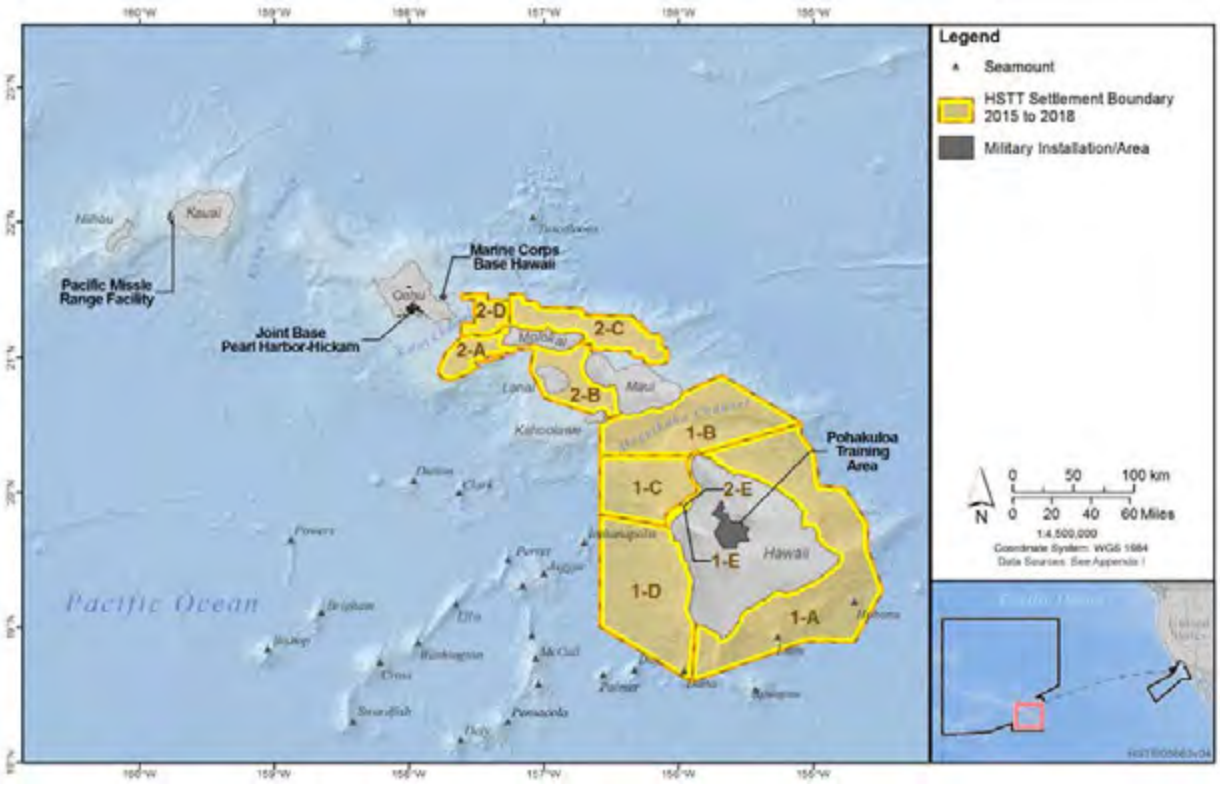


Figure K.5-1: Settlement Areas Within the Hawaii Portion of the HSTT Study Area

K.5.2.1 Settlement Area 1-A

Settlement Area 1-A overlaps with the following biologically important areas as discussed in Section K.3:

- False Killer Whale Small and Resident Population Area: Main Hawaiian Islands Insular Stock (see Section K.3.3)
- Pygmy Killer Whale Small and Resident Population Areas (see Section K.3.3.1.3)
- Hawaii Island Short-finned Pilot Whales Small and Resident Population Area (see Section K.3.5)
- Common Bottlenose Dolphin Small and Resident Population Area (see Section K.3.7)
- Spinner Dolphin Small and Resident Population Area (see Section K.3.8.5)
- Cuvier's Beaked Whale Small and Resident Population Area (see Section K.3.11)
- Blainville's Beaked Whale Small and Resident Population Area (see Section K.3.12)

Please refer to those sections for a full assessment of Settlement Area 1-A.

K.5.2.2 Settlement Area 1-B

Settlement Area 1-B overlaps with the following biologically important areas as discussed in Section K.3:

- Northwest Hawaiian Island Humpback Whale Reproduction Area (see Section K.3.1.7)
- False Killer Whale Small and Resident Population Area: Main Hawaiian Islands Insular Stock (see Section K.3.3)
- Hawaii Island Short-finned Pilot Whales Small and Resident Population Area (see Section K.3.5)

- Kohala Resident Melon-headed Whales Small and Resident Population Area (see Section K.3.6)
- Common Bottlenose Dolphin Small and Resident Population Area (see Section K.3.7)
- Spinner Dolphin Small and Resident Population Area (see Section K.3.8.5)
- Cuvier's Beaked Whale Small and Resident Population Area (see Section K.3.11)
- Blainville's Beaked Whale Small and Resident Population Area (see Section K.3.12)

Please refer to those sections for a full assessment of Settlement Area 1-B.

K.5.2.3 Settlement Area 1-C

Settlement Area 1-C overlaps with the following biologically important areas as discussed in Section K.3:

- Northwest Hawaiian Island Humpback Whale Reproduction Area (see Section K.3.1.7)
- False Killer Whale Small and Resident Population Area: Main Hawaiian Islands Insular Stock (see Section K.3.3)
- Dwarf Sperm Whale Small and Resident Population Area (see Section K.3.2)
- Pygmy Killer Whale Small and Resident Population Areas (see Section K.3.3.1.3)
- Hawaii Island Short-finned Pilot Whales Small and Resident Population Area (see Section K.3.5)
- Common Bottlenose Dolphin Small and Resident Population Area (see Section K.3.7)
- Pantropical Spotted Dolphin Small and Resident Population Area (see Section K.3.8)
- Spinner Dolphin Small and Resident Population Area (see Section K.3.8.5)
- Hawaii Island Rough-toothed Dolphin Small and Resident Population Area (see Section K.3.10)
- Cuvier's Beaked Whale Small and Resident Population Area (see Section K.3.11)
- Blainville's Beaked Whale Small and Resident Population Area (see Section K.3.12)

Please refer to those sections for a full assessment of Settlement Area 1-C.

K.5.2.4 Settlement Area 1-D

Settlement Area 1-D overlaps with the following biologically important areas as discussed in Section K.3:

- Dwarf Sperm Whale Small and Resident Population Area (see Section K.3.2)
- Pygmy Killer Whale Small and Resident Population Areas (see Section K.3.3.1.3)
- Hawaii Island Short-finned Pilot Whales Small and Resident Population Area (see Section K.3.5)
- Common Bottlenose Dolphin Small and Resident Population Area (see Section K.3.7)
- Pantropical Spotted Dolphin Small and Resident Population Area (see Section K.3.8)
- Spinner Dolphin Small and Resident Population Area (see Section K.3.9)
- Hawaii Island Rough-toothed Dolphin Small and Resident Population Area (see Section K.3.10)
- Cuvier's Beaked Whale Small and Resident Population Area (see Section K.3.11)
- Blainville's Beaked Whale Small and Resident Population Area (see Section K.3.12)

Please refer to those sections for a full assessment of Settlement Area 1-D.

K.5.2.5 Settlement Area 1-E and 2-E

Settlement Area 1-E and 2-E are located in nearshore waters along the northwest coastline of Hawaii Island. They are considerably smaller than the other settlement areas and overlaps with the nearshore portions of settlement areas 1-B and 1-C (Figure K.5-1). Settlement Area 1-E overlaps with the following biologically important areas as discussed in Section K.3:

- Dwarf Sperm Whale Small and Resident Population Area (see Section K.3.2)
- False Killer Whale Small and Resident Population Area: Main Hawaiian Islands Insular Stock (see Section K.3.3)
- Pygmy Killer Whale Small and Resident Population Areas (see Section K.3.3.1.3)
- Kohala Resident Melon-headed Whales Small and Resident Population Area (see Section K.3.6)
- Common Bottlenose Dolphin Small and Resident Population Area (see Section K.3.7)
- Pantropical Spotted Dolphin Small and Resident Population Area (see Section K.3.8)
- Spinner Dolphin Small and Resident Population Area (see Section K.3.9)
- Hawaii Island Rough-toothed Dolphin Small and Resident Population Area (see Section K.3.10)
- Blainville's Beaked Whale Small and Resident Population Area (see Section K.3.12)

Settlement Area 2-E overlaps with the following biologically important areas as discussed in Section K.3:

- Dwarf Sperm Whale Small and Resident Population Area (see Section K.3.2)
- False Killer Whale Small and Resident Population Area: Main Hawaiian Islands Insular Stock (see Section K.3.3)
- Pygmy Killer Whale Small and Resident Population Areas (see Section K.3.3.1.3)
- Kohala Resident Melon-headed Whales Small and Resident Population Area (see Section K.3.6)
- Common Bottlenose Dolphin Small and Resident Population Area (see Section K.3.7)
- Pantropical Spotted Dolphin Small and Resident Population Area (see Section K.3.8)
- Spinner Dolphin Small and Resident Population Area (see Section K.3.9)
- Blainville's Beaked Whale Small and Resident Population Area (see Section K.3.12)

Please refer to those sections for a full assessment of Settlement Area 1-E and 2-E.

K.5.2.6 Settlement Area 2-A

Settlement Area 2-A overlaps with the following biologically important areas as discussed in Section K.3:

- Southeast Oahu and Penguin Bank Humpback Whale Reproduction Area (see Section K.3.1.6)
- False Killer Whale Small and Resident Population Area: Main Hawaiian Islands Insular Stock (see Section K.3.1.1)
- Oahu Common Bottlenose Dolphin Small and Resident Population Area (see Section K.3.7.3.2)
- Spinner Dolphin Small and Resident Population Area: Oahu and 4-Islands Region (see Section K.3.9.3.6)

Please refer to those sections for a full assessment of Settlement Area 2-A.

K.5.2.7 Settlement Area 2-B

Settlement Area 2-B overlaps with the following biologically important areas as discussed in Section K.3:

- 4-Islands Region and Penguin Bank Humpback Whale Reproduction Area (see Section K.3.1.6)
- 4-Islands Region Common Bottlenose Dolphin Small and Resident Population Area (see Section K.3.7.4)
- 4-Islands Region Pantropical Spotted Dolphin Small and Resident Population Area (see Section K.3.8.3)
- Oahu and 4-Islands Region Spinner Dolphin Small and Resident Population Area (see Section K.3.9.3.6)

Please refer to those sections for a full assessment of Settlement Area 2-B.

K.5.2.8 Settlement Area 2-C

Settlement Area 2-C overlaps with the following biologically important areas as discussed in Section K.3:

- False Killer Whale Small and Resident Population Area: Main Hawaiian Islands Insular Stock (see Section K.3.1.1)
- 4-Islands Region Common Bottlenose Dolphin Small and Resident Population Area (see Section K.3.7.4)
- Oahu and 4-Islands Region Spinner Dolphin Small and Resident Population Area (see Section K.3.9.3.6)

Please refer to those sections for a full assessment of Settlement Area 2-C.

K.5.2.9 Settlement Area 2-D

Settlement Area 2-D overlaps with the following biologically important areas as discussed in Section K.3:

- False Killer Whale Small and Resident Population Area: Main Hawaiian Islands Insular Stock (see Section K.3.1.1)
- Oahu Common Bottlenose Dolphin Small and Resident Population Area (see Section K.3.7.3.2)
- Oahu and 4-Islands Region Spinner Dolphin Small and Resident Population Area (see Section K.3.9.3.6)

Please refer to those sections for a full assessment of Settlement Area 2-D.

K.5.3 Navy Requirements for Area-Specific Training and Testing in the Hawaii Portion of the HSTT Study Area

Navy training and testing requirements for the Hawaiian Islands settlement areas are described in the referenced biologically important area descriptions above. For example, for a description of training and testing requirements overlapping with Settlement Area 2-D, please refer to the following subsections of the false killer whale biologically important area description: Section K.3.3.1.4, Section K.3.3.1.7, and Section K.3.3.2.1. The same or additional Navy training and testing requirements are described in the biologically important area descriptions for common bottlenose dolphin and spinner dolphin, as noted above for Settlement Area 2-D.

K.5.4 Proposed Mitigation Areas that Overlap the Hawaii Portion of the HSTT Settlement Agreement areas

The Navy proposes to establish mitigation areas based on informed scientific data and are balanced with the operational training and testing needs of the Navy. These proposed mitigation areas are more protective of species than the 2015 HSTT Settlement Agreement areas. See Section K.2.2 (Mitigation Areas to be Implemented) for details on these proposed mitigation areas.

K.5.5 Settlement Areas Within the Southern California Portion of the HSTT Study Area

Within the Southern California portion of the HSTT Study Area there are seven locations that were part of the provisional settlement agreement as noted in the following sections. References to other sections of this appendix are provided where geographic overlap occurs between the settlement area and a previously described biologically important area. Table K.1-1 also indicates which biologically important areas overlap spatially with settlement areas.

The seven settlement areas are subdivided into two geographically distinct areas. Settlement areas 3-A, 3-B, and 3-C are adjacent to the coast and extend seaward approximately 20 km from shore (Figure K.5-2). Settlement areas 4-A, 4-B, 4-C, and 4-D are located farther offshore in areas with varying bathymetry.

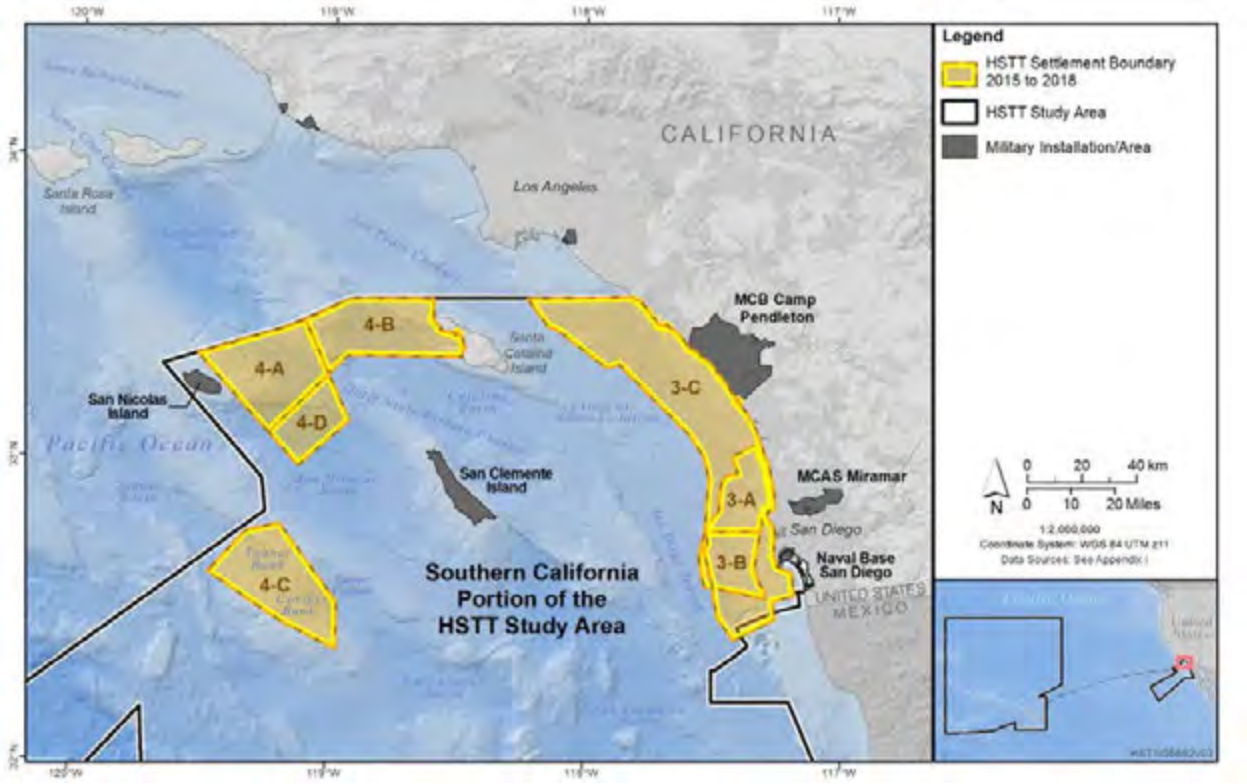


Figure K.5-2: Settlement Areas Within the Southern California Portion of the HSTT Study Area

Notes: MCB = Marine Corps Base, MCAS = Marine Corps Air Station

K.5.5.1 Settlement Area 3-A

Settlement Area 3-A overlaps with the following biologically important areas as discussed in Section K.4 (Biologically Important Areas within the Southern California Portion of the HSTT Study Area):

- San Diego Arc Blue Whale Feeding Area (see Section K.4.1.6)
- Gray Whale Migration Areas (see Section K.4.2)

Please refer to those sections for a full assessment of Settlement Area 3-A.

K.5.5.2 Settlement Area 3-B

Settlement Area 3-B overlaps with the following biologically important areas as discussed in Section K.4:

- San Diego Arc Blue Whale Feeding Area (see Section K.4.1.6)
- Gray Whale Migration Areas (see Section K.4.2)

Please refer to those sections for a full assessment of Settlement Area 3-B.

K.5.5.3 Settlement Area 3-C

Settlement Area 3-C overlaps with the following biologically important areas as discussed in Section K.4:

- Santa Monica Bay to Long Beach Blue Whale Feeding Area (see Section K.4.1.3)
- Gray Whale Migration Areas (see Section K.4.2)

Please refer to those sections for a full assessment of Settlement Area 3-C.

K.5.5.4 Settlement Area 4

K.5.5.4.1 Settlement Area 4-A

Settlement Area 4-A overlaps with the following biologically important areas as discussed in Section K.4:

- San Nicolas Island Blue Whale Feeding Area (see Section K.4.1.4)
- Gray Whale Migration Areas (see Section K.4.2)

Settlement Area 4-A also overlaps with beaked whale habitat assessed in Section K.7.2

Please refer to those sections for a full assessment of Settlement Area 4-A.

K.5.5.4.2 Settlement Area 4-B

Settlement Area 4-B overlaps with the following biologically important areas as discussed in Section K.4:

- Gray Whale Migration Areas (see Section K.4.2)

Settlement Area 4-B also overlaps with beaked whale habitat assessed in Section K.7.2

Please refer to those sections for a full assessment of Settlement Area 4-B.

K.5.5.4.3 Settlement Area 4-C

Settlement Area 4-C overlaps with the following biologically important areas as discussed in Section K.4:

- Tanner-Cortes Bank Blue Whale Feeding Area (See Section K.4.1.5)
- Gray Whale Migration Areas (see Section K.4.2)

Settlement Area 4-C also overlaps with beaked whale habitat assessed in Section K.7.2

Please refer to those sections for a full assessment of Settlement Area 4-C.

K.5.5.4.4 Settlement Area 4-D

Settlement Area 4-D overlaps with the following biologically important areas as discussed in Section K.4:

Gray Whale Migration Areas (see Section K.4.2)

Settlement Area 4-D also overlaps with beaked whale habitat assessed in Section K.7.2

Please refer to this section for a full assessment of Settlement Area 4-D.

K.5.6 Navy Requirements for Area-Specific Training and Testing in the Southern California Portion of the HSTT Study Area

Navy training and testing requirements for the Southern California settlement areas are described in Section K.4.1.3.1, Section K.4.1.4.1, Section K.4.1.5.1, and Section K.4.1.6.1 in the blue whale biologically important area description and in Section K.4.2.1.3 in the gray whale biologically important area description.

K.5.7 Proposed Mitigation Areas that Overlap the Southern California Settlement Agreement Areas

The Navy proposes to establish mitigation areas based on informed scientific data and are balanced with the operational training and testing needs of the Navy. These proposed mitigation areas are more protective of species than the 2015 HSTT Settlement Agreement areas. See Section K.2.2 (Mitigation Areas to be Implemented) for details on these proposed mitigation areas.

K.6 Areas Identified by the California Coastal Commission

As discussed in Section K.1.1.3, the Navy agreed in 2016 to recognize three areas within the California coastal zone (3 NM from shore) (Table K.1-1; Figure K.6-1) as low use areas for hull-mounted mid-frequency sonar during major training events and to provide annual notice to the California Coastal Commission of such usage. The Navy also agreed that for training in the Southern California portion of the HSTT Study Area that involves a single underwater detonation greater than 20 pounds net explosive weight occurring between sunset and sunrise, the Navy shall provide California Coastal Commission post-event notice within 72 hours of the event. Many of these agreement areas overlap with biologically important areas for certain species' behavior as discussed in Section K.4 (Biologically Important Areas within the Southern California Portion of the HSTT Study Area). Where there is overlap between the areas identified by the California Coastal Commission and an area which has been designated as biologically important for certain species' behavior in Calambokidis et al. (2015), the reader is directed to the description of the area presented in Section K.4 (Biologically Important Areas within the Southern California Portion of the HSTT Study Area) to reduce redundancy and to put the development of the identified areas in the appropriate context. In May 2018, a California Coastal Commission staff report provided additional conditions for the Navy to consider implementing within the Southern California portion of the HSTT Study Area; those are discussed below.

There are no reasonably foreseeable coastal effects on populations or stocks of marine mammals that may inhabit the California coastal zone. This finding for marine mammals in the coastal zone is consistent with the previous findings from NMFS concluding that Navy training and testing activities do not create conditions of chronic, continuous underwater noise and are unlikely to lead to more than temporary changes in habitat selection or are unlikely to lead to long-term hormonal or physiological stress responses in marine mammals (National Marine Fisheries Service, 2015). This conclusion has been

supported by research conducted since 2006 by the Navy, non-Navy marine mammal scientists, and research institutions undertaking scientific monitoring and research in the Atlantic and Pacific where the Navy has been and proposes to continue training and testing. These same training and testing activities are similar if not identical to activities that have been occurring in the same locations for decades. There is no direct evidence in the Pacific suggesting Navy training and testing has had or may have any long-term consequences to blue whale populations, which is consistent with findings from NMFS (National Marine Fisheries Service, 2015). Research efforts and monitoring before, during, and after training and testing events have been implemented Navy-wide since 2006. The results of these efforts support the Navy's and NMFS' assessment that it is unlikely any impacts on populations of marine mammals, including blue whales, would have any long-term consequences as a result of continuing training and testing as described under the Proposed Action in the HSTT Study Area, including in the coastal zone.

This assessment is based on four indicators from areas in the Pacific where Navy training and testing has been ongoing for decades: (1) evidence documenting or suggesting that the number of marine mammals in these locations has been increasing, (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) eight 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.

Given that long-term consequences to blue whale populations are not reasonably foreseeable anywhere within the HSTT Study Area, including in the California coastal zone, it is not reasonably foreseeable that blue whales, which may periodically inhabit the California coastal zone during part of their lifecycle, would be subject to any significant adverse effects within the coastal zone. As a result, prohibitions or restrictions to Navy training and testing activities within the 3 NM coastal zone are not likely to further reduce effects on species and stocks of blue whales or their habitat.

K.6.1 Intended Species and Impacts Mitigated

The intention of the areas identified within the California coastal zone is to protect marine mammal species including coastal bottlenose dolphins (*Tursiops truncatus*), blue whales, fin whales, and gray whales, as well as other species protected by Marine Protected Areas (Figure K.6-1). The 3 NM areas overlaps with the nearshore northern portion of the biologically important area for blue whale feeding; and the northbound, southbound, and potential presence biologically important areas for gray whale migration. A discussion on fin whales in the context of biologically important habitat off Southern California is provided in Section K.7.2.8 (Waters Just off the Mainland Shelf, Between the 200 m and 1,000 m Isobaths).

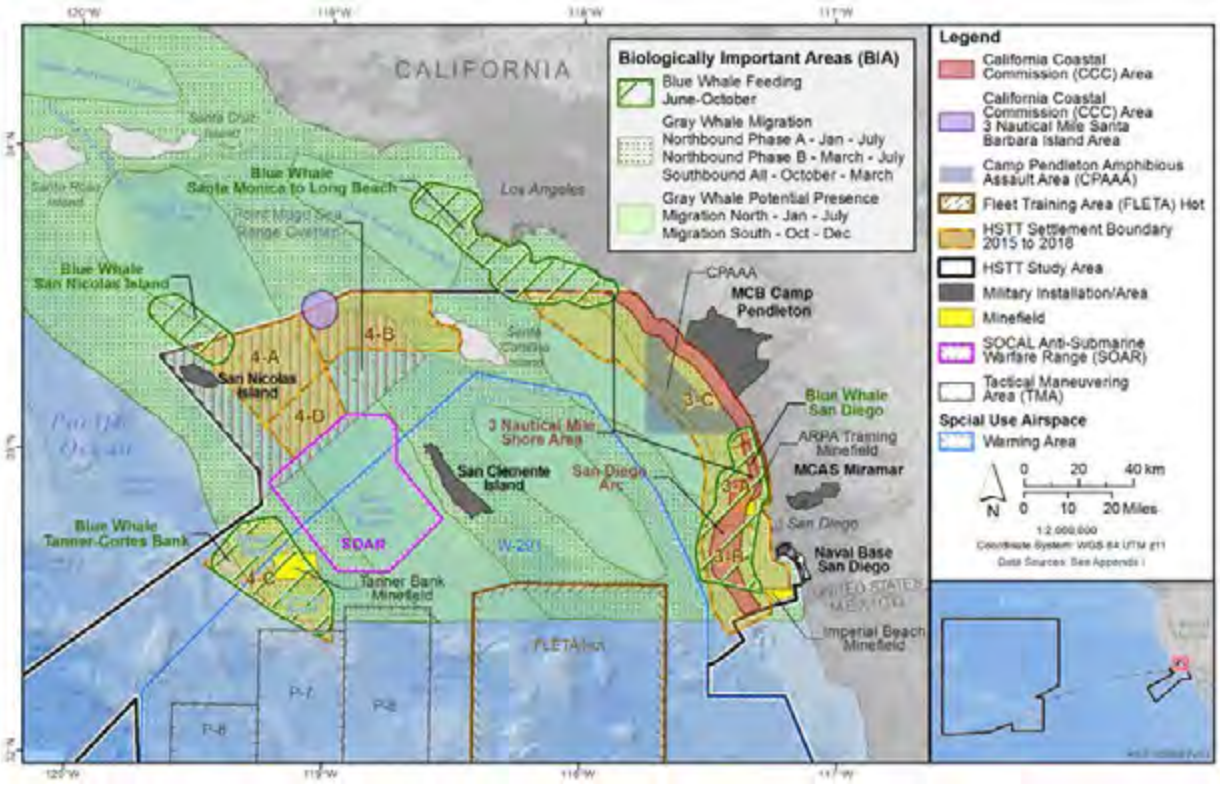


Figure K.6-1: California Coastal Commission Areas and Biologically Important Areas Within the Southern California Portion of the HSTT Study Area

Notes: MCB = Marine Corps Base; MCAS = Marine Corps Air Station; ARPA = Advanced Research Project Agency

K.6.2 San Diego Arc: Area Parallel to the Coastline from the Gulf of California Border to just North of Del Mar

This is an area proposed during the 2016 negotiated agreement with the California Coastal Commission and also submitted to the Navy for consideration in the May 2018 Commission staff report. The 2018 staff report included a recommendation to include all four designated blue whale feeding areas in addition to the San Diego Arc. San Diego Arc overlaps with the following biologically important areas for feeding blue whales as well as the gray whale migration area, as discussed in Section K.4 (Biologically Important Areas within the Southern California Portion of the HSTT Study Area):

- San Diego Blue Whale Feeding Areas (see Section K.4.1)
- Gray Whale Migration and Potential Presence Areas (see Section K.4.2.1.1)

The Navy will implement three mitigation areas that overlap with four of the blue whale feeding areas (San Diego Arc, Santa Monica/Long Beach, and San Nicolas Island Mitigation Areas). For details on these proposed mitigation areas, see Section K.2.2 (Mitigations Areas to be Implemented) and Section K.6.7 (Proposed Mitigation Areas within Areas Identified by the California Coastal Commission). For reasons why the blue whale feeding area within Tanner-Cortes Bank cannot be carried forward as a mitigation area, please see Section K.2.3 (Mitigation Areas Considered but not Carried Forward) and Section K.4.1.5.2 (Tanner-Cortes Bank Blue Whale Feeding Areas Mitigation Assessment). Navy training and testing requirements in the San Diego Arc Area are described in Section K.4.1.6.1 and Section K.4.2.1.3.

K.6.3 3 NM Santa Barbara Island Area: Area within 3 NM Around Santa Barbara Island within the Channel Islands National Marine Sanctuary

Similar to the San Diego Arc, the 3 NM area surrounding Santa Barbara Island was included in the 2016 negotiated agreement with the California Coastal Commission and submitted again to the Navy for consideration in the May 2018 Commission staff report. The area overlaps with the following biologically important area as discussed in Section K.4 (Biologically Important Areas within the Southern California Portion of the HSTT Study Area):

- Gray Whale Migration and Potential Presence Areas (see Section K.4.2.1.1.)

The Channel Islands National Marine Sanctuary consists of an area of 1,109 NM2 around Anacapa Island, Santa Cruz Island, Santa Rosa Island, San Miguel Island and, Santa Barbara Island to the south. Only 92 NM2 of Santa Barbara Island, or about 8 percent of the sanctuary, occurs within the Southern California portion of the HSTT Study Area. For more information on the Channel Islands National Marine Sanctuary refer to Section 6.1.2.7.2 (Channel Islands National Marine Sanctuary) in Chapter 6 (Other Regulatory Considerations) of the EIS/OEIS.

The Navy will continue to implement a mitigation area out to 6 NM of Santa Barbara Island, which includes a portion of the Channel Island National Marine Sanctuary and a marine protected area where the Navy will restrict the use of MF1 sonar sources and some explosive during training. For details on the Santa Barbara Island Mitigation Area, please see Section K.2.2 (Mitigation Areas to be Implemented).

K.6.4 3 NM Shore Area: Area within 3 NM from the Mainland California Shoreline Between Del Mar Northward to the Northern Boundary of the Southern California Portion of the HSTT Study Area

This is a similar measure proposed in the California Coastal Commission staff report of May 23, 2018. The staff report proposed a condition that would impose restrictions on MF1 sonar (surface ship hull-mounted, mid-frequency active sonar) and other sonar sources within a 1 km from shore area to protect coastal bottlenose dolphins. The 1 km shore area would also include a buffer with a corresponding distance depending on source (up to 4 km), to reduce exposure levels. The condition also included a prohibition on explosives from Bins E-6 through B-13 within the area. For more information on Biologically Important Areas that overlap with these areas, see the following sections:

- San Diego Blue Whale Feeding Areas (see Section K.4.1)
- Gray Whale Migration and Potential Presence Areas (see Section K.4.2.1.1)

For reasons why this 1 km area along the California shoreline cannot be carried forward as mitigation, please see Section K.2.3 (Mitigation Areas Considered but not Carried Forward).

K.6.5 State and Federal Marine Protected Areas

The May 2018 California Coastal Commission staff report included a recommendation for the Navy to consider a condition that would impose restrictions on MF1 sonar (surface ship hull-mounted, mid-frequency active sonar) and other sonar sources within MPAs (Catalina Island MPA, Mainland California Coast MPAs, including Orange County and northern San Diego County but excluding the MPA portion in the San Diego Arc Mitigation Area, and any MPA in or adjacent to the Silver Strand Training Complex). The staff report also included conditions to include a prohibition on all explosives and to impose vessel speed restrictions within the areas. These conditions are similar to those that the Commission provided

during the 2016 negotiated agreements, where the Navy agreed to place restrictions on certain activities in a portion of the Channel Island National Marine Sanctuary and MPA around Santa Barbara Island within the HSTT Study Area. As stated in the Chapter 6 (Regulatory Considerations) of the EIS/OEIS, none of the proposed activities associated with sonar or explosives are conducted in the majority of the Southern California MPAs (see Table 6.1-2 from the EIS/OEIS and Appendix A, Navy Activity Descriptions). For more information on biologically important areas that overlap with these MPAs, see the following section:

- Gray Whale Migration and Potential Presence Areas (Section K.4.2.1.1)

MPAs, as discussed in Chapter 6 (Regulatory Consideration) (Figure 6.1-2), are areas already with some level of federal, state, or local management or protection. MPAs vary widely in purpose, managing agencies, management approaches, level of protection, and restrictions on human uses. They have been designated to achieve objectives ranging from the conservation of biodiversity, to the preservation of sunken historic vessels, to the protection of spawning species important to commercial and recreational fisheries. The levels of protection provided by these marine protected areas range from fully protected reserves (i.e., no take of any species is permitted) to sites allowing multiple uses including fishing, recreation, and industrial uses (National Marine Protected Areas Center, 2008).

For reasons why these conditions cannot be carried forward fully as mitigation in all MPAs, please see Section K.2.3 (Mitigation Areas Considered but not Carried Forward).

K.6.6 San Nicolas basin Fin Whale and Beaked Whale Habitat

Similar to other areas discussed above, the California Coastal Commission staff report of May 2018 provided a recommended condition for the Navy to avoid the use of MF1 sonar and other sonar sources, to include a buffer with a corresponding distance depending on source (up to 4 km) to reduce exposure levels. The condition also included a prohibition on explosives from Bins E-6 through B-13 within the San Nicolas Basin, considered as an area of high fin and beaked whale concentrations. This is an area recommended previously during the 2016 negotiated agreement process. Discussions on fin whales and beaked whales in the context of biologically important habitat off Southern California are provided in:

- Section K.2.9 (Waters Just off the Mainland Shelf, Between the 200 m and 1,000 m Isobaths) for fin whales
- Section 7.2.1 (San Nicolas Basin) for Cuvier's beaked whales.

For reasons why these conditions cannot be carried forward, please see Section K.2.3 (Mitigation Areas Considered but not Carried Forward) and Section K.7.2.7 (Cuvier's Beaked Whale Habitat Areas Mitigation Assessment) and Section K.7.2.9 (Fin Whale Area Mitigation Assessment).

K.6.7 Navy Requirements for Area-Specific Training and Testing within Areas Identified by the California Coastal Commission

- Navy training and testing requirements in the San Diego Arc blue whale feeding area are described in Section K.4.1.6.1.
- Navy training and testing requirements in the Santa Monica/Long Beach blue whale feeding area are described in Section K.4.1.3.1.
- Navy training and testing requirements in the San Nicolas Island blue whale feeding area are described in Section K.4.1.4.1.

- Navy training and testing requirements in the Tanner-Cortes Bank blue whale feeding area are described in Section K.4.1.5.1.
- Navy training and testing requirements in the Santa Barbara Island area are described in Section K.4.2.1.3.

Navy training and testing requirements in the San Nicolas Basin are described in Sections K.7.2.1.2 and K.7.2.9.1.

K.6.8 Proposed Mitigation Areas Within Areas Identified by the California Coastal Commission

The San Diego Arc overlaps a San Diego Blue Whale Feeding Area biologically important area as discussed in Section K.4.1 (Blue Whale Feeding Areas). The Navy proposes to establish San Diego Arc, Santa Monica/Long Beach, and San Nicolas Island Mitigation Areas that overlap these biologically important areas (Figure K.2-1). The Navy proposes to limit the amount of surface ship hull-mounted, mid-frequency active sonar (MF1) and some explosives used during specific training and testing within these proposed mitigation areas. See Section K.2.2 (Mitigation Areas to be Implemented) for details on these proposed mitigation areas.

In addition, the Navy is proposing to establish a Santa Barbara Island Mitigation Area (Figure K.2-1) surrounding Santa Barbara Island out to 6 NM, to restrict the use of surface ship hull-mounted mid-frequency active sonar (MF1) during training and testing and explosives used in gunnery (all caliber), torpedo, bombing, and missile exercises (including 2.75-inch rockets) during unit-level training and major training exercises year round. This measures to prohibit explosives in the Santa Barbara Island or San Nicolas Island Mitigation Areas do not apply to testing events.

K.7 Areas Identified During the NEPA Public Involvement Process

Comments received during the HSTT EIS/OEIS public scoping and draft public comment period included suggestions that the Navy avoid conducting activities in locations identified in comments as important marine mammal habitat or areas that should otherwise no longer be used during Navy training and testing activities because of the presence of particular marine mammals in the vicinity of the area. The comments identified locations in both the Hawaii and Southern California portions of the HSTT Study Area. A review and evaluation of the areas identified in the scoping comments is organized by geographic area in sections K.7.1 (Hawaii Public Comment Area Assessment) and K.7.2 (Southern California Public Comment Areas). The comment areas are evaluated below.

K.7.1 Hawaii Public Comment Mitigation Area Assessment

For the Hawaii Range Complex, the comments present the generalization that seamounts are associated with productive fishing grounds, alter prey distributions and abundances, and therefore represent "important foraging habitat for top predators" including marine mammals. The scoping comment recommends that, "… the EIS assess the designation of a year-round management area to protect the seamount," and particularly as it represents habitat for various beaked whale species. However, it is worth noting that none of the Navy's proposed training or testing activities were identified as threats to seamount biodiversity or ecosystems by researchers as suggested in the comments. In general, seamount research considers the primary threats to seamount ecosystems to include (1) pollution; (2) habitat destruction, degradation, and fragmentation; (3) fisheries overexploitation; and (4) invasive alien species (United Nations Development Project 2013).

K.7.1.1 General Biological Assessment of Seamounts in the Hawaii Portion of the Study Area

Seamounts have been traditionally defined as any extinct or active underwater volcano rising more than 1 km above the seafloor (Kennett, 1982). With advances in ocean surveying, bathymetric features rising only 50–100 m above the seafloor may now be included as seamounts in some classifications (Kim & Wessel, 2011). Kvile et al. (2014) report on a comprehensive effort to assess current knowledge of the world's seamounts with the ultimate goal of collecting standardized data on seamounts and characterizing their ecological functions (Seamount Ecosystem Evaluation Framework, 2013). Their analysis shows that seamounts are numerous, found throughout the world's oceans, and that only a small percentage have been scientifically analyzed. The limited data highlights a general lack of knowledge and understanding of why some seamounts aggregate marine fauna and others do not.

In Hawaiian waters, the physical characteristics of seamounts mentioned in the comments have recently been measured with a relatively high degree of accuracy using multi-beam sonar; however, with the exception of Cross Seamount, no research has been conducted to characterize the ecological productivity at these seamounts. Morphological characteristics as shown in Table K.7-1 and other physical oceanographic conditions are critical to a seamount's influence on biological productivity. In particular, the depth of the summit and surrounding area of a seamount is an important indicator of the potential for sustained primary production (i.e., photosynthesis by plants) and support for higher trophic level species (e.g., marine mammals).

With regard to marine mammals, researchers have focused on seamounts having a summit that is within or near the euphotic zone (Hann et al., 2016; Morato et al., 2008). Of the seamounts listed in Table, only the summit of Cross Seamount approaches the height of the euphotic zone; although (McDonald et al., 2009) note that only sunlight sufficient for vision actually reaches the summit. Seventeen other named seamounts were also identified for consideration given they, "… exhibit levels of productivity capable of supporting commercial fisheries," according to the comment. However, the summits of these seamounts are much deeper (631 m to in excess of 3,000 m) and far below the depth considered by the Western Pacific Regional Fishery Management Council to sustain ground fish fisheries (Western Pacific Regional Fishery Management Council, 2009). Seamounts in the vicinity of biologically important areas identified for Cuvier's beaked whales are shown in Figure K.3-19.

While the physical characteristics of some seamounts have been linked to localized increases in biodiversity, which can aggregate pelagic predators and their prey (Baumann-Pickering et al., 2016b), the focus on seamounts generically as a generic class of bathymetric feature is simplistic relative to the level of analysis needed to adequately evaluate seamounts and their association with productivity; see for example (Pitcher et al., 2007; Pitcher et al., 2010). In Hawaii, the Western Pacific Regional Fishery Management Council has designated all escarpments and slopes between approximately 40 m and 280 m as habitat areas of particular concern for fisheries (Western Pacific Regional Fishery Management Council, 2009).

Many bathymetric features (e.g., an escarpment, ridge, slope, bank, or seamount) have the potential to influence productivity, biodiversity, and potentially the presence of fishery resources or marine mammals; however, the complementary oceanographic conditions (e.g., ocean fronts) must also be present for biological production (for example the escarpment off Hawaii Island's Keahole Point (Heenehan et al., 2017a; Norris & Dohl, 1980). Therefore, a blanket generalization expressing the need to protect seamounts, or any similar type of generic bathymetric feature, is not amenable to analysis or feasible given the wide variation in the morphological characteristics of these features and their limited

and poorly understood potential to support biological productivity and biodiversity (Hann et al., 2016; Morato et al., 2008). The conditions necessary to support productivity in the ocean is also temporally dynamic and results from the complex interaction of seasonal temperature fluctuations as well as the variable occurrence of oceanic fronts, which, themselves, may be the oceanographic feature driving biological productivity above or near a seamount rather than the bathymetric feature (Morato et al., 2015). A brief, general description of seamounts is therefore helpful for putting these comments and the ecological role of seamounts into context. Furthermore, and given the extreme variation in features generically referred to as seamounts, any analysis of potential impacts on seamount ecosystems and the marine life that they support, must first take into account the inherent variation between different types of seamounts.

Table K.7-1: Seamounts Identified in HSTT EIS/OEIS Public Comment

Seamount Name	Height of Seamount Above Seafloor (meters)	Depth of Summit (meters)	Depth around seamount (meters)	Area (km^2)	Max Width (km)	Max Length (km)
Cross	3,936	346	4,282	667	25	28
Pensacola	3,572	631	4,203	611	23	31
Bishop	4,020	756	4,776	720	27	31
McCall	3,535	877	4,412	1,634	29	60
Washington	3,077	929	4,006	488	21	25
Swordfish	3,875	969	4,844	892	32	27
Finch	3,830	1,026	4,856	747	27	30
Daly	3,362	1,243	4,605	397	23	24
Ellis	2,869	1,455	4,324	676	15	51
Jagger	3,083	1,555	4,638	930	25	46
Brigham	2,825	1,713	4,538	647	37	22
Perret	1,696	2,130	3,826	187	6	24
Palmer	2,354	2,168	4,522	259	16	16
Day	2,000	2,300	4,300	255	18	14
Dutton	1,933	2,592	4,525	267	16	23
Clark	1,268	2,705	3,973	93	20	8
Powers	1,545	2,883	4,428	109	15	10
Indianapolis	1,592	3,152	4,744	303	21	18

Source: 50 m Bathymetry Grid at http://www.soest.hawaii.edu/HMRG/multibeam/bathymetry.php

K.7.1.2 Cross Seamount

The acoustic detections of beaked whales at Cross Seamount (Baumann-Pickering et al., 2014; McDonald et al., 2009) are part of the rationale stated in the comments for recommending the designation of a year-round management area to protect seamounts. The comment identified the location of Cross Seamount simply by a set of coordinates, "… approximately 18°40' North latitude and 158°1' West longitude." No bounded area or distance from this single geographic point was provided to characterize the biologically important habitat for which mitigation was recommended. Multi-beam sonar bathymetry data available from University of Hawaii indicates Cross Seamount extends over an

area of approximately 670 km^2, has an elevation of 3,936 m above the seafloor, and comes within 346 m of the surface. Baumann-Pickering et al. (2014) identify the location of Cross Seamount as 18° 43.343" North latitude and 158° 15.221" West longitude.

Beaked whales produce sounds that are frequency modulated echolocation pulses, which are species-specific. For beaked whales in Hawaii and the North Pacific, six of these species-specific echolocation pulses are classifiable to the species while four of these beaked whale sounds types cannot be assigned to a species (Baumann-Pickering et al., 2016a). Acoustic recording devices at Cross Seamount have documented the presence of sounds from beaked whales, and other marine mammal species-specific sounds at that location (Baumann-Pickering et al., 2010; Baumann-Pickering et al., 2014; Baumann-Pickering et al., 2016a; McDonald et al., 2009). Cross Seamount was highlighted in the comment as having "the greatest conservation priority" and as being particularly important for several species of beaked whales and possibly "a potentially rare or evolutionary distinct species of beaked whale." This concern over the beaked whales acoustically recorded at Cross Seamount as being "rare" or an "evolutionary distinct species" was based on speculation in an older reference (McDonald et al., 2009) that has been superseded by more recent analysis of that same data by a team that included many of the same authors from the original publication (Baumann-Pickering et al., 2014). The more up-to-date findings and hypothesis (Baumann-Pickering et al., 2014) is that the majority of beaked whale signals recorded at Cross Seamount from November 2005 to May 2006 (McDonald et al., 2009) were (the BWC pulse type) produced by ginkgo-toothed beaked whales. Ginkgo-toothed beaked whales have been found at various locations in the Indian Ocean and throughout the Pacific Ocean as far north as Japan and as far south as Southern Australia and New Zealand. As a result, ginkgo-toothed beaked whales should not be considered rare or an evolutionary distinct species. To the south of the Hawaii portion of the HSTT Study Area, acoustic recordings from a seamount near the equator in the Northern Line Islands also encountered this same signal (the BWC pulse type) assigned to ginkgo-toothed beaked whales at Cross Seamount (Baumann-Pickering et al., 2016b).

It is important to note that Cross Seamount is the only open ocean bathymetric feature in the area of the Hawaiian Islands where a passive acoustic monitoring device has been installed long-term for the purpose of detecting the presence of marine mammals. For example, some of the first acoustic sampling of bathymetrically featureless areas off Southern California detected many beaked whales over an abyssal plain and not associated with slope or seamount features, which counters a common misperception that beaked whales are primarily found over slope waters, in deep basins, or over seamounts (Griffiths & Barlow, 2016). Since the 2005-2006 Cross Seamount survey, a subsequent passive acoustic survey was conducted from December 11, 2014 and January 26, 2015 in the Hawaii Range Complex using an autonomous glider fitted with an acoustic receiver (Klinck et al., 2015). The survey began and ended approximately 120 km south of Honolulu, Oahu, navigating a circular track through deep ocean waters that intermittently crossed over or near multiple seamounts, including Cross Seamount, and relatively featureless areas in between. Sounds from Blainville's beaked whales were detected in the open ocean areas and at Brigham Seamount, but not at Cross Seamount or any of the other seamounts sampled along the glider's route. Sounds identified previously (Baumann-Pickering et al., 2014) as belonging to ginkgo-toothed beaked whales were detected at Cross Seamount but also at four other locations not associated with any seamount or other known bathymetric feature (Klinck et al., 2015).

In summary for Cross Seamount, the available science indicates that the bathymetric feature is used as habitat for at least one species of beaked whale that has been tentatively identified as the

ginkgo-toothed beaked whale. Data from acoustic sampling tracks in deep ocean areas indicate the species is also present in locations lacking bathymetric relief. Ginkgo-toothed beaked whales have been documented at various locations throughout the Pacific, and, although it is unlikely they are as numerous as Cuvier's beaked whales are in Southern California or Blainville's beaked whales are in Hawaii, ginkgo-toothed beaked whales should not be considered rare in the Pacific. The location of a bathymetric feature is not necessarily the driver for aggregating biological productivity and biodiversity, including the presence of marine mammals. At a seamount in the Northern Line Islands, researchers determined that sea surface temperature correlated with the seasonal presence or absence of particular beaked whale species (Baumann-Pickering et al., 2016b). The presence or behavior of other marine mammal species correlated with changes in oceanographic conditions, including surface salinity, sea surface height, and primary productivity (Baumann-Pickering et al., 2016b). While bathymetry can influence these conditions, changes in oceanographic conditions are not limited to fixed locations, such that a species influenced mainly by changes in sea surface temperature may or may not aggregate near a bathymetric feature, such as a seamount. Additional research including surveying for marine mammals in relation to a variety of oceanographic conditions, in areas with diverse bathymetry, and for longer durations that span seasons is needed to determine the range of habitat preferences for the species producing the BWC pulse type (most likely ginkgo-toothed beaked whales) and other beaked whales in Hawaii.

K.7.1.2.1 Navy Requirements for Area-Specific Training and Testing

The general area and the unique bathymetry features found in W-194 beyond 32 NM from the west side of Hawaii Island, replicates operationally significant bathymetry encountered during deployments to both the Western Pacific and Middle East. Cross Seamount is in the open ocean area portion of the Hawaii OPAREA. Activities that may occur anywhere in the Hawaiian OPAREA include (for activity details see Appendix A, Navy Activity Descriptions):

- Chaff Exercise
- Visit, Board, Search, and Seizure
- Air-to-Surface Gunnery Exercise
- Sea Bombing Exercise
- Sinking Exercise (will not occur on the Cross Seamount because Sinking Exercise requires depths of 6,000 ft. or greater)
- Surface Warfare and Anti-submarine Warfare Torpedo Exercise, Anti-submarine Warfare Tracking Exercise
- Anti-submarine Warfare major training exercises and Integrated/Coordinated Anti-submarine Warfare training (e.g., Rim of the Pacific, Undersea Warfare)
- Electronic warfare operations
- Mine Countermeasure exercise
- Personnel insertion/extraction

It is unlikely that Cross Seamount would be used for independent unit-level training because it is impractically far from port. This portion of the Hawaii OPAREA is used for larger coordinated events like Undersea Warfare Exercise where the bathymetry is important to challenge operators and increase the

realism and value of the training. For example, seamounts may represent fictional islands in a scenario to mimic real-world areas of interest. The relatively large group of seamounts in the open ocean south of the main Hawaiian Islands offers challenging bathymetry in the open ocean far away from civilian vessel traffic and air lanes where ships, submarines, and aircraft are completely free to maneuver. Sonar may be used by a variety of platforms in support of anti-submarine warfare events and torpedo exercises. Commanding Officers may always conduct a number of opportunistic unit-level training activities concurrent with major exercises.

Cross Seamount is in the Luna Central Air Traffic Control Assigned Airspace just south of Special Use Airspace W-193. Luna Central is available to extend the Special Use Airspace and is activated to provide more southern area airspace to W-193 when necessary. Major training events like Rim of the Pacific or Undersea Warfare Exercise may require activating Luna Central as an extension of W-193. Activities utilizing in-water explosives, such as underwater detonations, bombing exercises or torpedo exercises, will not usually be conducted in Luna Central unless it has been extended as Special Use Airspace.

Nearby seamounts include Indianapolis Seamount and Jagger seamount, located approximate 35 NM and 45.5 NM from the west side of Hawaii Island respectively, in W-194. As part of the arc of seamounts that include Cross Seamount they are important features for ships, air platforms, and submarines to execute realistic threat tactics. The loss of this geography could result in reduced training effectiveness for submarine, surface ship, and air crews. In order to effectively train in and around this unique bathymetry, operators must be able to freely search throughout the area surrounding the seamounts. In order to execute realistic anti-submarine warfare training, overlapping airspace and sea space is needed to simulate tactical prosecution.

K.7.1.3 Hawaii Public Comment Mitigation Area Assessment

At intensively used Navy instrumented ranges in waters surrounding Hawaii and off southern California, years of scientific findings have documented high densities of beaked whales and long-term (multi-year) residency by individual beaked whales (Baird et al., 2015b; Debich et al., 2015a; Debich et al., 2015b; Falcone et al., 2009; Falcone & Schorr, 2011, 2012, 2013, 2014a; Henderson et al., 2015b; Hildebrand et al., 2009; Lammers et al., 2015a; Manzano-Roth et al., 2013; Širović et al., 2016; Smultea, 2014). This long-term scientific record suggests that Navy training and testing activities, including those that use sonar and explosives, do not deter beaked whales from inhabiting an area where these activities have been occurring for decades, including within the Hawaii Range Complex where a number of seamounts identified in the comments are located.

Considering that other oceanographic features or conditions, such as changes in sea surface temperature, have been shown to influence the behavior of beaked whales and other odontocetes (Baumann-Pickering et al., 2016b) and that these features are not necessarily linked to a particular seamount or seamounts in general, mitigation that limits activities at seamounts is not likely to increase the effectiveness of the Navy's current mitigation measures.

This area was suggested for mitigation based on its rich pelagic biodiversity and high productivity and as foraging habitat for beaked whales. The recommendation also suggested that the Navy consider other nearby seamounts within the Hawaii Range Complex for habitat-based management measures given they are considered productive long-line fishing grounds for top predators. Cross Seamount is not in any way more important to Navy activities than any of the other surrounding seamounts, but it is centrally located in the middle of a group of seamounts, and potential mitigation restricting Navy activities (i.e., restricting vessel movement or the use of sonar) around Cross Seamount could inhibit free maneuver

and the full implementation of tactics, techniques, and procedures, reducing the realism of events in that portion of the Hawaii OPAREA. The collection of seamounts south of the main Hawaiian Islands is the only group of seamounts in the Hawaii OPAREA, making it unique. While this area was suggested for multiple species, this appendix will consider mitigation using beaked whales as a proxy because they were specifically highlighted in the proposal and are one of the most sensitive marine mammal groups to human-made sound studied to date.

Behavioral response research has demonstrated that beaked whales are sensitive to sound from sonars and usually avoid sound sources by 10 or more kilometers (see Chapter 3.7, Marine Mammals). These are well beyond the ranges to TTS for mid-frequency cetaceans such as beaked whales. Therefore, impacts on beaked whales are most likely to be behavioral reactions (they may startle, break off feeding dives, and avoid the area of the sound source). In research done at the Navy's fixed tracking range in the Bahamas and Hawaii, animals leave the immediate area of the anti-submarine warfare training exercise but return within a few days after the event ends. Significant behavioral reactions seem likely if beaked whales are exposed to anti-submarine sonar within a few tens of kilometers, especially for prolonged periods (a few hours or more). The types of coordinated anti-submarine warfare events and major training events that take places in this area involve multiple sonar systems and can last for a period of days, making significant responses more likely.

Cross Seamount only takes up a very small portion of the Hawaii Range Complex and sonar use in this area would be relatively infrequent (Rim of the Pacific typically only occurs every two years, Undersea Warfare is only one to three times per year, and this area is not always used). No species of beaked whale are known to be resident on Cross Seamount. Additionally, more recent acoustic sampling of bathymetrically featureless areas off Southern California with drifting hydrophones by NMFS detected many beaked whales over abyssal plains that were not always associated with slope or seamount features, which counters a common misperception that beaked whales are primarily found over slope waters, in deep basins, or over seamounts (Griffiths & Barlow, 2016). Some impacts on beaked whale natural behaviors could occur due to sonar and other transducers. However, abandonment of Cross Seamount by beaked whales is not expected to occur because the populations of beaked whales and other odontocetes on Navy fixed ranges that have been operating for decades appear to be stable.

Beaked whales currently number almost 17,000 individuals in the California, Oregon, and Washington and Hawaiian stocks. It is unlikely the same animal would have a significant behavioral response to sonar more than a few times per year due to exposure to sound from sonar. A few behavioral reactions in an individual animal within a given year, even if some are significant, are unlikely to have any long-term consequences for that individual. Considering these factors, long-term consequences for the species or stock would be unlikely. Therefore, it is not clear that additional mitigation for sonar or other transducers on Cross Seamount or other seamounts in the area would reduce impacts on beaked whales, or reduce the availability of prey for subsistence uses. Existing protective mitigation measures would likely reduce or avoid impacts on beaked whales feeding within this area.

Given the tens of kilometer ranges at which beaked whales avoid sonar, sound from sonar or other transducers nearby from outside a hypothetical mitigation zone could still expose animals foraging on Cross Seamount to acoustic stressors. A hypothetical mitigation zone[s] around Cross Seamount and possibly other nearby seamounts that would be large enough to preclude behavioral reactions could inappropriately segment the area available for realistic maneuvering and make training ineffective. Confining activities to only the portions of the area that lie outside hypothetical seamount mitigation zones could limit the sea space available to maneuver in a realistic way as required by tactics and to de-

conflict when multiple platforms are present. Ships require sea space for safety of navigation, appropriate stand-off ranges when deploying weapons, and to prevent mutual interference between sonar and electronic emissions. The Navy would not be able to stop training with sonar on all seamounts because Navy platforms must operate in a coordinated manner on similar bathymetry in the real world.

Based on the best available science, beaked whales that may exhibit a significant behavioral reaction due to sonar and other transducers; however, behavioral reaction would not result in long-term consequences for individuals or populations. However, because of a lack of scientific consensus regarding the causal link between sonar and stranding events, NMFS has stated in a letter to the Navy dated October 2006 that it "cannot conclude with certainty the degree to which mitigation measures would eliminate or reduce the potential for serious injury or mortality." Neither NMFS nor the Navy anticipates that marine mammal stranding or mortality will result from the operation of sonar during Navy activities within the Study Area. Additionally, through the MMPA process (which allows for adaptive management), NMFS and the Navy will determine the appropriate way to proceed in the event that a causal relationship was to be found between Navy activities and a future stranding.

Navy quantitative modeling does not estimate any non-auditory injury to beaked whales due to explosives across the HSTT Study area. Modeling estimates a single PTS across the HSTT Study Area due to exposure to sound and energy from explosions during training for each alternative. PTS could reduce an animal's ability to detect biologically important sounds; however, a small threshold shift due to low-frequency sound from an explosion is unlikely to affect the hearing range that beaked whales rely upon. Nevertheless, PTS could have minor long-term consequences for individuals.

Odontocetes overall have shown little responsiveness to impulsive sounds although it is likely that beaked whales are more reactive than most other odontocetes. It is reasonable to expect that animals may leave an area of more intense explosive activity for a few days; however, most explosive use during Navy activities is of short duration, consisting of only a single or few closely timed explosions with a limited footprint, and usually consisting of a single target or detonation point. Because noise from most activities using explosives is short term and intermittent and because detonations usually occur within a small area, behavioral reactions from beaked whales are likely to be short term and moderate severity. This minor consequence for individuals is unlikely to have any long-term consequences for the species or stocks. Given that this area is rarely used for in-water explosives training and testing, long-term consequences for the population would be unlikely.

While the Navy will continue to implement procedural mitigation measures throughout the Study Area, implementing new geographic based mitigation measures in addition to ongoing procedural mitigation measures within the vicinity of Cross Seamount would not be effective at reducing adverse impacts on beaked whales or other marine mammal populations. The Navy has been training and testing in the broad ocean area around Cross Seamount with the same basic systems for over 40 years and there is no evidence of any adverse impacts having occurred. In other locations and Navy ranges such as in Southern California and off the coast of Kauai where Navy training and testing is much more frequent and intense in comparison to Cross Seamount, beaked whales and other marine mammal populations are thriving. The broad ocean area around Cross Seamount and the seamounts to the north are unique in that there are no similar broad ocean areas in the vicinity of the Hawaiian Islands that are not otherwise encumbered by commercial vessel traffic and commercial air traffic routes. In addition to this safety consideration, reducing or limiting Navy training and testing at or around Cross Seamount other seamounts in Hawaiian waters would not be practicable and would reduce the effectiveness of training and testing if pieces of the ocean environment are unavailable for full tactical consideration during Navy

events. In summary, geographic mitigation would not reduce adverse impacts on any marine mammal population at Cross Seamount or other seamounts when balanced with the mitigation's practicality of implementing. The Navy alteration of ongoing activities in, or avoidance of, the area as suggested in the comment, is not warranted.

K.7.2 Southern California Public Comment Mitigation Area Assessment

The public comments suggested several geologic and oceanographic regions of the Southern California portion of the HSTT Study Area as potentially important for marine mammals (Table K.7-2). Each region and the species identified in the comments is discussed in the sections below.

Table K.7-2: Public Comment Areas for Consideration within the Southern California Portion of the Study Area

Area Name	Species and location summary	Seasonality
San Nicolas Basin	Cuvier's beaked whales - San Nicolas Basin; Tanner Canyon to the south and Santa Cruz Basin to the North	(not provided)
Catalina Basin	Cuvier's beaked whales - Catalina Basin	(not provided)
Southern California Bight	Beaked whales - Southernmost edge of California Current, west of Tanner-Cortes Bank (approx. lat/long of Site E 32.75N, 119.46W)	(not provided)
Northern Catalina Basin and San Clemente Basin	Perrin's beaked whales –"southern-central waters of the bight"; northern Catalina Basin, including south-east of Santa Catalina Island, and the San Clemente Basin	(not provided)
Southern California waters just off the mainland shelf, between the 200 meter and 1,000 meter isobaths	Fin whales - off Southern California between 200 m and 100 m isobaths	November through February

Notes: spp. = species, lat = latitude, long = longitude, N = North, W = West, HARP = High-frequency Acoustic Recording Package, m = meter(s).

San Nicolas Basin and Catalina Basin (Figure K.7-1) were suggested in public comments as areas that should receive special protection to limit or reduce impacts on Cuvier's beaked whales. Refer to Section K.7.2.1 (San Nicolas Basin) and Section K.7.2.2. (Santa Catalina Basin) for a brief description of each basin. Generally speaking, a basin can be described as a completely enclosed depression deeper than the surrounding seafloor, consequently basins are some of the deepest areas in the oceans (Kennett, 1982).

Cuvier's beaked whales have been encountered in almost all areas of the Pacific where surveys have occurred, including deep, open-ocean areas (Hamilton et al., 2009). The Cuvier's beaked whale is the most commonly encountered beaked whale off the west coast of the United States (Carretta et al., 2017). This species is found from Alaska to Baja California, Mexico, and there are no apparent seasonal changes in distribution(Mead, 1989; Pitman et al., 1988). Research involving tagged Cuvier's beaked whales in the Southern California Range Complex has documented movements in excess of hundreds of kilometers (Falcone et al., 2009; Falcone & Schorr, 2011, 2012, 2013, 2014a; Gassmann et al., 2015).

Schorr et al. (2014) reported that five out of eight tagged whales journeyed approximately 250 km from their tag deployment location and one of these five made an extra-regional excursion over 450 km to the south to Mexico and back.

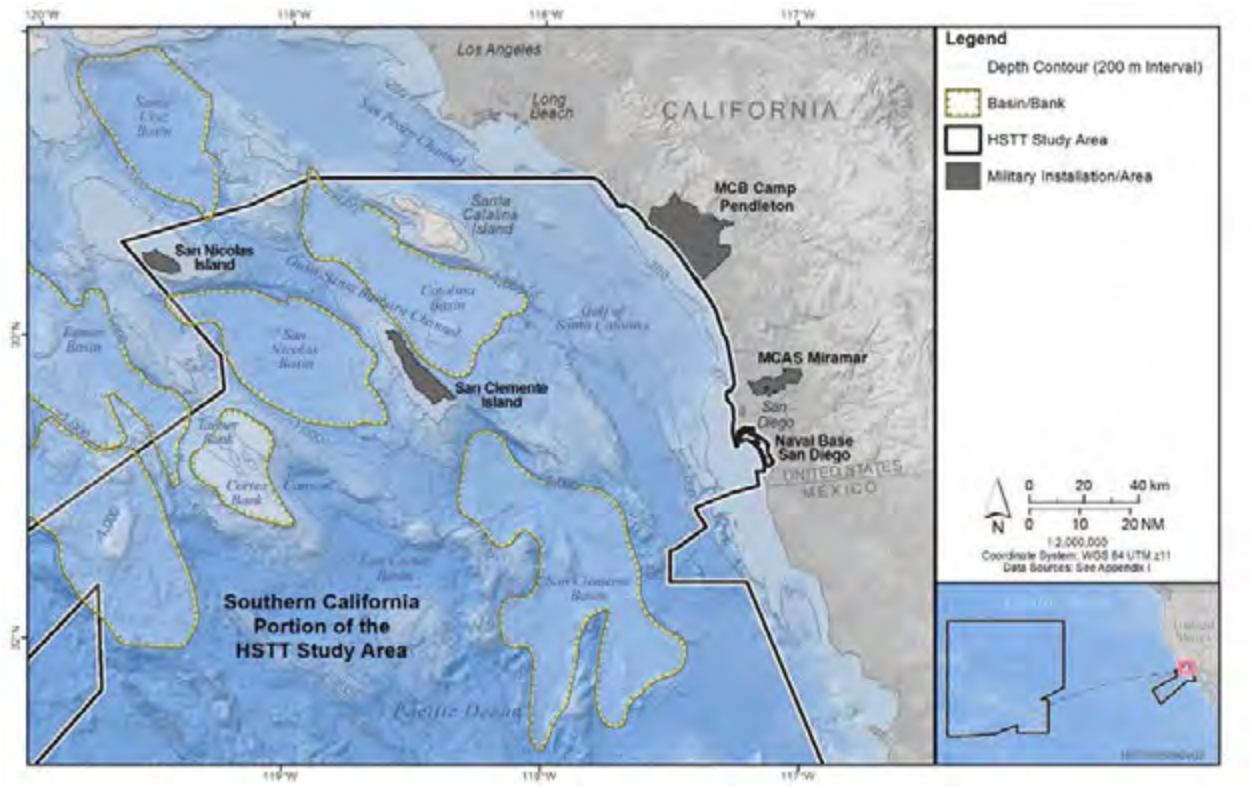


Figure K.7-1: Basins in the Southern California Bight Referred to in Public Comments

Notes: MCB = Marine Corps Base; MCAS = Marine Corps Air Station

During ship surveys conducted quarterly off Southern California from 2004 to 2008, there were only six beaked whale sightings; however, half of these were Cuvier's beaked whales (Douglas et al., 2014). During 18 aerial surveys conducted in the Southern California Range Complex from 2008 through 2013, Cuvier's beaked whales were sighted on two occasions (Jefferson et al., 2014). Repeated sightings of the same individuals have been reported off San Clemente Island in southern California, which indicates some level of site fidelity (Falcone et al., 2009). Cuvier's beaked whales have also frequently been heard on passive acoustic recording devices in the Southern California portion of the HSTT Study Area (Širović et al., 2016). In a series of surveys from 2006 to 2008, Falcone et al. (2009) proposed that the ocean basin west of San Clemente Island may be an important region for Cuvier's beaked whales. However this is not one of the areas designated as a "biologically important area" (Calambokidis et al., 2015). Acoustic sampling of bathymetrically featureless areas off Southern California detected many beaked whales over an abyssal plain and not associated with slope or seamount features, which counters a common misperception that beaked whales are primarily found over slope waters, in deep basins, or over seamounts (Griffins and Barlow 2016).

Documented multi-year residency by Cuvier's beaked whales at the Navy's instrumented Southern California Anti-Submarine Warfare Range, where sonar is frequently used (Falcone et al., 2009; Falcone & Schorr, 2012, 2014a), would seem to indicate a lack of individual impacts, and considering the multi-year span, population-level impacts. Photo identification studies in the Southern California Range

Complex have identified approximately 100 individual Cuvier's beaked whales, with 40 percent having been seen in one or more prior years, and re-sightings occurring up to 7 years apart (Falcone & Schorr, 2014a). Schorr et al. (2018) stated for the most recent field season from 2016 to 2017 that: "Identification photos of suitable quality were collected from 69 of the estimated 81 individual Cuvier's beaked whales encountered in 2016-2017. These represented 48 unique individuals, with eight of these whales sighted on two different days, and another three on three different days during the study period. Nineteen (39 percent) of these whales had been sighted in previous years. Many more whales identified in 2016 had been sighted in a previous year (16/28 individuals, 57 percent), compared to 2017 (5/22 individuals, 23 percent), though both years had sightings of whales seen as early as 2007. There were three adult females photographed in 2016 that had been sighted with calves in previous years, one of which was associated with her second calf. Additionally, a fourth adult female, first identified in 2015 without a calf, was subsequently sighted with a calf. The latter whale was sighted for a third consecutive year in 2017, this time without a calf, along with two other adult females with calves who had not been previously sighted. These sightings of known reproductive females with and without calves over time (n = 45) are providing critically needed calving and weaning rate data for Population Consequences of Disturbance (PCoD) models currently being developed for this species on SOAR" (Southern California Anti-submarine Warfare Range).

In 2018, an estimate of overall abundance of Cuvier's beaked whales at the Navy's instrumented range in San Nicolas Basin was obtained using new dive-counting acoustic methods and an archive of passive acoustic M3R data representing 35,416 hours of data (DiMarzio et al., 2018; Moretti, 2017). Over the 7-year interval from 2010 to 2017, there was no observed change and perhaps a slight increase in annual Cuvier's beaked whale abundance within San Nicolas Basin (DiMarzio 2018). There does appear to be a repeated dip in population numbers and associated echolocation clicks during the fall centered around August and September (DiMarzio et al., 2018; Moretti, 2017). A similar August and September dip was noted by researchers using stand-alone off-range bottom passive acoustic devices in Southern California (will cite some of the Scripps reports). This dip in abundance may be tied to some as yet unknown population dynamic or oceanographic and prey availability dynamics.

The area referred to as the "California Current" in the context of NMFS survey results for Cuvier's beaked whales includes all waters along the U.S. west coast out to 300 NM from the shoreline and extending from the Washington State–Canada border in the north to the California–Mexico border in the south. The comment suggested that "habitat-based management" for Cuvier's beaked whales is necessary, because "… beaked whale populations in the California Current have shown significant, possibly drastic declines in abundance over the last twenty years," with a citation to Moore and Barlow (2013). The authors of the cited study reporting the decline in the abundance over the years 1991-2008 also documented high densities of beaked whales at the instrumented training range off San Clemente Island (which includes the San Nicolas Basin). The authors continued to note that the high densities of beaked whales specifically where the Navy has been training and testing for decades are obviously not consistent with a hypothesis that declining abundance may be due to Navy activities (Moore & Barlow, 2013). Additionally, recent abundance estimates that include data from an additional survey conducted in 2014 suggest that there may be a change in the prior downward trend of beaked whale abundance off the U.S. west coast (Barlow, 2016). Moore and Barlow (2017) incorporated NMFS' latest U.S. west coast survey data through 2014. The authors commented that when including the 2014 data that "Cuvier's beaked whales appear to have decreased in abundance from high values in 1991-93, but that decline now appears to have leveled off." In addition, Moore & Barlow (2013, 2017) draw their Bayesian trend analysis from data along the entire U.S. west coast including a significant portion of the U.S.

Economic Exclusion Zone and coast where the Navy does not conduct in water training. While the population trend for the entire U.S. west coast may be uncertain, multiple studies have indicated that the abundance of beaked whales remains high in waters surrounding Navy training and testing areas off Southern California and specifically in areas where Navy has been training and testing for decades. Results from passive acoustic monitoring have estimated regional Cuvier's beaked whale densities in and around the Southern California Range Complex were higher than indicated by the NMFS's broad-scale visual surveys for the U.S. west coast (Debich et al., 2015a; Debich et al., 2015b; Falcone & Schorr, 2012, 2014a; Hildebrand et al., 2009; Širović et al., 2016; Smultea, 2014). In conclusion, within San Nicolas Basin, there is a documented, recurring number of Cuvier's beaked whales strongly indicating that the Navy is not having a population level impact to this species. This is supported by repeated visual re-sighting rates of individuals, sightings of calves and more importantly reproductive females, and passive acoustic assessments of steady vocalization rates and abundance over at least the most recent 7-year interval. Furthermore, the Navy will continue to fund this critical work on Cuvier's beaked whales for at least the next five years.

K.7.2.1 San Nicolas Basin and Areas North

San Nicolas Basin is the low-lying area separating San Clemente Island along the basin's southeast rim, Tanner Bank to the southwest, and San Nicolas Island located on the basin's north rim (Figure K.7-1). The area of the basin is approximately 2,300 km^2. Depth in the San Nicolas Basin ranges from approximately 1,800 m at its deepest point to 1,500 m along the rim of the basin(National Oceanic and Atmospheric Administration, 2013). The basin is approximately 10 NM off the southern coast of San Nicolas Island and 5 NM from San Clemente Island's west coast. The Navy's underwater instrumented training and testing range, established in the 1980s, overlaps with the San Nicolas Basin.

The public comment regarding San Nicolas ("Nicholas" [sic]) Basin expresses concern over impacts on the population of Cuvier's beaked whales that inhabit the area off southern California, including San Nicolas Basin. As noted above in Section K.7.2 (Southern California Public Comment Mitigation Area Assessment), current research and monitoring data indicate that the beaked whales have continued to inhabit the Navy's instrumented range and surrounding area where activities using sonar have occurred for decades.

K.7.2.1.1 Navy Requirements for Area-Specific Training and Testing

The Cuvier's beaked whale habitat within the San Nicholas Basin overlaps the entire Southern California Anti-submarine Warfare instrumented range and Laser Training Ranges 1-5. The Southern California Anti-submarine Warfare Range is the premier high value anti-submarine warfare training and testing area on the West Coast. Southern California Anti-submarine Warfare Range is the only instrumented range along the West Coast and is sited to support pre deployment training of San Diego (and Pacific Northwest) based units. Every deploying unit depends on the Southern California Anti-submarine Warfare Range to provide the highest level of training possible. The capability to record (score) training events provides the ability to "play back" the events after the exercise to indicate immediate feedback that greatly improves the value of the training to those participating.

As U.S. surface active sonar capabilities improve, the ability to train surface ship crews in submarine detection, location, tracking, and prosecution will increase. In addition, submarine crews need to train with surface vessels in these areas using mid-frequency active sonar as part of their anti-submarine warfare tactics and active sonar avoidance in shallow water and the adjacent deep water. Submarine commanders and crew train to meet certification objectives. Their requirements evolve as other nation's

surface active sonar technologies and capabilities improve and as those nations' active sonar employment increases.

K.7.2.2 San Nicolas Basin Cuvier's Beaked Whales Mitigation Considerations

Complete or even partial avoidance of the San Nicolas Basin and the relocation of Navy training and testing activities would curtail Navy use of this critical and unique bathymetric feature, reducing the realism and effectiveness of training and testing activities. Furthermore, avoiding the area by relocating activities is not likely to significantly reduce impacts on Cuvier's beaked whales since almost all suitable deep water habitats greater than 800 m in Southern California could conceivably contain detections of Cuvier's beaked whales if monitored. The species is widely distributed within Southern California and across the Pacific.

The Southern California Anti-submarine Warfare Range within the San Nicolas Basin has supported naval training for decades and is used routinely by naval forces to conduct valuable anti-submarine warfare training. The Navy depends on ready access to the Southern California Anti-submarine Warfare Range, making it unfeasible to limit access or activities within the Southern California Anti-submarine Warfare Range without impacting the effectiveness of the military readiness activities conducted in the Southern California portion of the HSTT Study Area. Relocating an instrumented range would be costly in addition to losing the unique bathymetric features the area offers along with its close proximity to San Clemente Island for collecting critical in-water track and communication data, and would result in degraded readiness and capability.

Beaked whales in the Southern California portion of the HSTT Study Area may be exposed to sonar or other transducer's used during training and testing activities throughout the year. However, the quantitative analysis estimates exposures resulting in behavioral reactions or TTS, and a single PTS exposure from sonar and other transducers under either Alternative for all beaked whale species in the overall Southern California portion of the HSTT Study Area. Significant impacts on beaked whale natural behaviors or abandonment/avoidance of habitat due to training and testing with sonar and other transducers are unlikely to occur within beaked whale habitat.

Beaked whales in the Southern California portion of the HSTT Study Area may be exposed to sound from explosives used during training and testing activities throughout the year. However, the quantitative analysis estimates few exposures resulting in behavioral reactions or TTS, and a single PTS exposure from explosives under either Alternative for all beaked whale species in the overall Southern California portion of the HSTT Study Area. PTS could have minor long-term consequences for an individual; however, it is unlikely to have any long-term consequences for the species or stocks.

While the Navy will continue to implement procedural mitigation measures throughout the Study Area, implementing new geographic based mitigation measures in addition to ongoing procedural mitigation measures within the vicinity of San Nicolas Basin would not be effective at reducing adverse impacts on beaked whales or other marine mammal populations. The Navy has been training and testing in and around the San Nicolas Basin with the same basic systems for over 40 years and there is no evidence of any adverse impacts having occurred. There are no indications that Navy training and testing has had any adverse impacts on populations of Cuvier's beaked whales in Southern California.

Navy ranges and infrastructure within the San Nicolas Basin are critical to the Navy's training and testing mission and so it is unfeasible to limit or reduce access or preclude activities within the Southern California portion of the HSTT Study Area. In summary, geographic mitigation would not effectively

balance a reduction of biological impacts with an acceptable level of impact on military readiness activities.

K.7.2.3 Catalina Basin

The Catalina Basin separates San Clemente Island and Santa Catalina Island (Figure K.7-1). The rim of the basin is at approximately the 1,000 m isobaths and the deepest parts near the center of the basin exceed 1,300 m (National Oceanic and Atmospheric Administration, 2013). The basin forms part of the Outer Santa Barbara Channel and leads into the Gulf of Santa Catalina. A vessel traffic separation scheme for northbound and southbound commercial vessels moving through the San Pedro Channel passes over the northeastern corner of the Santa Catalina Basin. The traffic separation scheme coordinates vessel traffic serving Los Angeles and Long Beach, which are two of the world's largest and busiest ports.

A stated concern for this population of Cuvier's beaked whale is "subject to regular acoustic disturbance due to the presence of the Shore Bombardment Area," which is not correct. The Shore Bombardment Area is a naval gun impact area located on land, at the southern end of San Clemente Island. Based on a figure provided in a comment on the DEIS/OEIS (labeled in part "SHOBA in red"), it is clear that the comment confuses the in-water administrative boundaries used for temporary exclusion of vessels for public safety, with the delineation of the area where Navy training and testing activity may occur. The in-water administrative boundary for the Shore Bombardment Area does not delineate the locations where a ship firing at the land target is located and does not represent where gunfire rounds are targeted. Therefore, the Shore Bombardment Area would not result in underwater acoustic disturbance to Cuvier's beaked whales located within the Catalina Basin.

Satellite telemetry data demonstrate a high degree of site fidelity to the Navy's training and testing range, but the stated concerns were not specific to the Catalina Basin and do not note the small sample of only two animals that were tagged in the Catalina Basin (Falcone & Schorr, 2014a). The researchers who did the tagging noted that movements of beaked whales into the Catalina Basin from elsewhere were "strikingly uncommon" (Falcone & Schorr, 2014a). Navy-funded passive acoustic monitoring within the HSTT Southern California Range Complex has been ongoing for over two decades, but not all areas are monitored continuously and devices have been deployed and removed from various locations. Santa Catalina Basin was only monitored under from August 2005 to July 2009 and has not been actively monitored since then, a period of eight years. For San Clemente Island, the single monitoring site "S" used in Baumann-Pickering et al. (2014) and cited as the source of the comment's claim for San Clemente Basin was only deployed for a limited time of approximately 1.5 years resulting in 409 days of data (Sep 2009-May 2011). For both sites combined, only 41 hours of BW43 signal types were detected over a cumulative approximately five and half years of monitoring. The 41 hours of BW43 detections therefore only represents a small fraction of overall recording time (less than 1 percent).

It also has to be cautioned that the beaked whale signal type detected called BW43 has been suggested as coming from Perrin's beaked whales (Baumann-Pickering et al., 2014), but not yet conclusively and scientifically confirmed.

A different Navy-funded single site south of San Clemente Island within the San Clemente Basin has had a passive acoustic device in place from July 2014 through current. Širović et al. (2016) and Rice et al. (2017) contain the most current results from San Clemente Basin site "N". While Širović et al. (2016) and Rice et al. (2017) do report periodic passive acoustic detections of Mesoplodon beaked whales thought to be Perrin's beaked whale in San Clemente Basin, the overall detection rate, periodicity, and

occurrence has not been high. Between May 2015 and June 2016 a period of little over a year of monitoring, there were only seven weeks in which potential Perrin's beaked whale echolocation clicks were detected with each week having less 0.14 hours per week of detections. Acoustic sampling of bathymetrically featureless areas off Southern California with drifting hydrophones by NMFS detected many beaked whales over abyssal plains and not always associated with slope or seamount features, which counters a common misperception that beaked whales are primarily found over slope waters, in deep basins, or over seamounts (Griffiths & Barlow, 2016). One of these devices deployed within the Southern California Range Complex of HSTT detected Cuvier's beaked whales, Baird's beaked whales, and unidentified Mesoplodon beaked whales. In addition, analysis of NMFS visual survey data from 2014, the most recent year available, showed an increase in Mesoplodon beaked whales along the entire US West Coast which the authors attributed to an influx of tropical species of Mesoplodon during the unusually warm water condition that year (Barlow, 2016; Moore & Barlow, 2017). Perrin's beaked whale, part of the Mesoplodon guild, could be part of these sightings. In summary, San Clemente Basin and Santa Catalina Basin with similar low passive acoustic detection rates are likely to be part of Perrin beaked whale's general distribution along the U.S. West Coast and in particular Southern California and Baja Mexico. This distribution is likely to be wide ranging for Perrin's beaked whales as a species and highly correlated to annual oceanographic conditions. Santa Catalina and San Clemente basins do have infrequent suspected Perrin's beaked whale passive acoustic detections from a limited number of devices, but these areas may not specifically represent unique high occurrence locations.

The frequent and nearly continuous transiting of larger commercial vessels through the shipping channel may explain why beaked whales do not routinely move between the Navy training and testing range and the Catalina Basin. It should also be noted that there was no indication in (Falcone & Schorr, 2014a) that it is, "…likely that a small and resident population of Cuvier's beaked whales also resides in the Santa Catalina Basin" as the comment incorrectly indicates.

As noted in Section K.7.2 (Southern California Public Comment Mitigation Area Assessment), a high degree of site fidelity to the Navy's training and testing range and long-term residency of many individuals, indicate that beaked whales have continued to inhabit areas where Navy activities using sonar have occurred for decades.

K.7.2.3.1 Navy Requirements for Area-Specific Training and Testing

The Cuvier's beaked whale habitat within the Catalina Basin is located between Santa Catalina Island and San Clemente Island and overlaps with Settlement Area 4-B.

The Catalina Basin remains a unique, critical training area used for strait transit training during integrated events incorporating surface, air, subsurface, and unmanned aerial systems. Sonobuoy quality assurance testing only occurs in a portion of this area because the in-water instrumentation extends to collecting and processing equipment located on San Clemente Island. The basin is important because of the extensive, long-term support infrastructure established on San Clemente Island.

The area overlaps three (of eight) sections of the federal Safety Zone (33 Code of Federal Regulations 165.1141). Safety zone rulemaking designations not easily altered. The area is also important for unit level training because of its proximity to San Diego Bay and Southern California Anti-submarine Warfare Range.

Situated between San Clemente Island and Santa Catalina Island, the Catalina Basin underlies a restricted path for surface vessel maneuver, while at the same time providing excellent bathymetric configurations for submarines to mask their presence during strait transit training. In addition, proximity

to the ultra-high-frequency relay stations on San Clemente Island is mandatory for operating unmanned aerial systems in conjunction with strait transit training.

K.7.2.3.2 Catalina Basin Cuvier's Beaked Whales Mitigation Considerations

Complete avoidance of the Catalina Basin would be unfeasible because it could result in excessive transit time and fuel costs to relocate the events and could severely degrade critical pre-deployment training in preparation for real world threats to naval personnel and assets. To move the activities to other locations could result in a greater concentration of activity in areas that already have heavy training schedules.

Avoiding the area by relocating activities is not likely to significantly reduce impacts on Cuvier's beaked whales since almost all suitable deep water habitats greater than 800 m in Southern California could conceivably contain Cuvier's beaked whales and there is no evidence that the Catalina Basin is home to any higher concentration of Cuvier's beaked whales than any other suitable habitat.

Beaked whales in the Southern California portion of the HSTT Study Area may be exposed to sonar or other transducer's used during training and testing activities throughout the year. However, the quantitative analysis estimates exposures resulting in behavioral reactions or TTS, and a single PTS exposure from sonar and other transducers for all beaked whale species in the overall Southern California portion of the HSTT Study Area. Significant impacts on beaked whale natural behaviors or abandonment/avoidance of habitat due to training and testing with sonar and other transducers are unlikely to occur within beaked whale habitat. Any TTS in the biologically important areas would be minor to moderate, from which the individual whale would fully recover quickly.

Beaked whales in the Southern California portion of the HSTT Study Area may be exposed to sound and energy from explosives used during training and testing activities throughout the year. However, the quantitative analysis estimates only a few exposures resulting in behavioral reactions or TTS, and a single PTS exposure from explosives under either Alternative for all beaked whale species in the overall Southern California portion of the HSTT Study Area. PTS could have minor long-term consequences for an individual; however, it is unlikely to have any long-term consequences for the species or stocks.

Despite the acknowledged difficulty in sighting beaked whales, Navy vessels are uniquely suited to detect marine mammals (forward bridge, dedicated lookouts) and are more likely to avoid strikes (highly maneuverable) and Navy sailors receive training specifically intended to sharpen their ability to sight marine mammals. Furthermore, all surface vessels use extreme caution and proceed at safe speeds so they can take proper and effective action to avoid a collision with any sighted object or disturbance, and that the vessel can be stopped within a distance appropriate to the prevailing circumstances and conditions (see Section 2.3.3, Standard Operating Procedures in Chapter 2, Description of Proposed Action and Alternatives).

While the Navy will continue to implement procedural mitigation measures throughout the Study Area, implementing new geographic based mitigation measures in addition to ongoing procedural mitigation measures within the vicinity of Catalina Basin would not be effective at reducing adverse impacts on beaked whales or other marine mammal populations. The Navy has been training and testing in and around the Catalina Basin with the same basic systems for over 40 years and there is no evidence of any adverse impacts having occurred. There are no indications that Navy training and testing has had any of adverse impacts on populations of Cuvier's beaked whales in Southern California. The main source of anthropogenic noise in the Catalina Basin is associated with commercial vessel traffic concentrated in

the San Pedro Channel that runs next to Catalina Island and leads to and from the ports of Los Angeles/Long Beach.

The Catalina Basin are critical to the Navy's training and testing mission and so it is unfeasible to limit or reduce access or preclude activities within that water space in the Southern California portion of the HSTT Study Area. Given there is no evidence of impacts to the population of beaked whales in the area, and low potential occurrence of Perrin's beaked whales in the Southern California portion of the HSTT Study Area, geographic mitigation would not effectively balance a reduction of biological impacts with an acceptable level of impact on military readiness activities. In summary, geographic mitigation would not effectively balance a reduction of biological impacts with an acceptable level of impact on military readiness activities.

K.7.2.4 Southernmost Edge of California Current, West of Tanner-Cortes Bank

This area, also referred to in the same public comments as "southern offshore waters, west of Southern California Anti-Submarine Warfare Range and Tanner and Cortes Banks," cannot be precisely delineated given the broad nature of the generalized area described in the comment. This general area being referred to is also assumed to contain the monitoring sites noted in the cited reference (Baumann-Pickering et al., 2015b) and described by the authors in the cited reference as well as related in related papers as, "… 17 sites across the region, from Point Conception to an area south of San Diego, in a variety of bathymetries and distances from shore" (Baumann-Pickering et al., 2014; Baumann-Pickering et al., 2015a; Baumann-Pickering et al., 2015b). Tanner Bank and Cortes Bank are located west of the San Nicolas Basin and south of San Nicolas Island (Figure K.7-1). Both banks rise to within 20 m of the surface depending on oceanographic conditions (e.g., tides, wave heights) and are a component of the biologically important areas designated for blue whale feeding (see Section K.4.1.5, Tanner-Cortes Bank Blue Whale Feeding Area) and overlap with Settlement Area 4-C (see Section K.5.3.4.9, Settlement Area 4-C). Between 60 and 90 km west of the two banks, the seafloor drops precipitously to nearly 4,000 m (National Oceanic and Atmospheric Administration, 2013).

The California Current is a large-scale oceanic current forming the eastern boundary of the North Pacific Gyre. The current can broadly be defined as extending along the U.S. west coast from the Washington State–Canada border in the north to the California–Mexico border in the south and from nearshore out to 300 NM. At its southern extent the California Current divides and feeds into the North Equatorial Current which flows west along the equator (Pickard & Emery, 1990). The position of the California Current, including the location of its southern boundary, changes seasonally as well as inter-annually with large scale phenomena like the El Niño Southern Oscillation and the Pacific Decadal Oscillation. The fluctuating nature of a current, which is often defined in terms of changes or gradients in ocean properties such as sea surface temperate and salinity, would make it very difficult to delineate a specific geographic area based on the position of the California Current.

The comments interprets the research findings of (Baumann-Pickering et al., 2015b), including the presence of acoustic detections, rates of acoustic detections, estimated "small" abundance, and daily averages, as support for designating the area as biologically important. The authors of the research cited in the comments specifically warned in a related publication that, "…caution should be used to not over-interpret the results" and that, "Relative site presence also should not be directly related to abundance" (Baumann-Pickering et al., 2014). Baumann-Pickering et al. (2014) and Baumann-Pickering et al. (2015b) did not specify this area as biologically important and the author's data only indicated there have been detections of the Cuvier's beaked whales within this area.

As described above in Section K.7.2 (Southern California Public Comment Mitigation Area Assessment), the Navy's monitoring program, which has been specifically focused on determining what impacts if any may be occurring to beaked whales, has supported a substantive research effort for many years in the Navy's Southern California Range Complex and coordinated with similar efforts in adjoining waters.

Almost all suitable deep water habitat >800 m in Southern California could conceivably contain detections of Cuvier's beaked whales. The species is widely distributed within Southern California and across the Pacific. Only limited population vital rates exist for beaked whales including numbers of animals, populations vs. subpopulations determination, and residency time for individual animals (Schorr et al., 2017; Schorr et al., 2018). The science of passive acoustic monitoring is positioned to answer some questions on occurrence and seasonality, but cannot as yet address all fundamental population parameters including individual residency time. Furthermore, while passive acoustic monitoring within Southern California has been ongoing for 28 years, with many sites funded by the Navy, not all sites have been consecutively monitored for each year. All of the single bottom-mounted passive acoustic devices used for the analysis by Baumann-Pickering et al. (2014) and Baumann-Pickering et al. (2015b) and used by the comment to support its argument are not continuous and have various periodicities for which data have been collected. Devices have been deployed and removed from various locations with some sites having multiple years of data, other significantly less with perhaps just a few months out of a year. For instance, Site E used to justify the area west of Tanner and Cortes Banks was not monitored over 28 years. Site E was only monitored for 322 days from September 2006 through July 2009 (slightly less than a full year's worth of data). Site E was also a test site for 63 days from December 2010 through February 2011. For this latest period deployed, Site E was therefore only monitored for approximately 18 percent of a single year between 2010 and 2011. During this test of a passive acoustic array capable of tracking at Site E (west of Tanner and Cortes Banks), Gassmann et al. (2015) reported detection of only three Cuvier's beaked whales over six separate encounter and time intervals of 10–33 minutes. As single point sources of data, these passive acoustic devices may not be indicative of Cuvier's beaked whale presence at other locations within Southern California without comparable devices. For example, more recent acoustic sampling of bathymetrically featureless areas off Southern California with drifting hydrophones by NMFS detected many beaked whales over abyssal plains and not always associated with slope or seamount features, which counters a common misperception that beaked whales are primarily found over slope waters, in deep basins, or over seamounts (Griffiths & Barlow, 2016).

Nor would older passive acoustic data prior to 2009 be indicative of current or future occurrence especially in terms of potential impact of climate change on species distributions. To summarize, this limited duration (less than three years prior to 2010 and 63 days prior to 2011) may or may not be reflective of current beaked whale distributions within Southern California and into the future. Furthermore, passive acoustic only detection of beaked whales without additional population parameters can only determine relative occurrence which could be highly variable over sub-regions and through time. The Navy continues to fund additional passive acoustic field monitoring for beaked whales in Southern California, as well as research advancements for density derivation from passive acoustic data (DiMarzio et al., 2018; Moretti, 2017; Rice et al., 2017; Schorr et al., 2017; Schorr et al., 2018; Širović et al., 2017).

K.7.2.4.1 Navy Requirements for Area-Specific Training and Testing

The seasonal Cuvier's beaked whale habitat within the southernmost edge of the California Current/Bight, west of Tanner-Cortes Bank, is located within the heavily used western portion of the

Southern California portion of the HSTT Study Area and west of the instrumented Southern California Anti-submarine Warfare Range, all of which are high value training venues for anti-submarine warfare training (See K.4.1.5.1 (Navy Requirements for Area Specific Training and Testing) for a complete discussion on the use of Tanner-Cortes Bank for training and testing requirements).

Naval units routinely use this area (similar to areas within the Santa Catalina Basin to the east and Tanner Canyon to the south) to set up complex anti-submarine warfare events prior to commencing into the Southern California Anti-submarine Warfare Range. Units also perform sonar maintenance and system checks prior to the event. Explosives are not routinely used in this area.

K.7.2.4.2 Southernmost Edge of California Current/Bight, West of Tanner-Cortes Bank Cuvier's Beaked Whales Mitigation Considerations

The area identified as the southernmost edge of the California Current, west of Tanner-Cortes Bank, is adjacent to the Navy's most important anti-submarine and mine warfare training venue for unit level through integrated training where year-round access cannot be compromised. Segmenting large areas, such as the southernmost edge of California Current/Bight, west of Tanner-Cortes Bank within the heavily utilized western portion of the Southern California Range Complex, would result in degrading high-value anti-submarine warfare training. This would also result in unnecessary crowding of inherently hazardous naval activities into ever decreasing available sea space, potentially increasing safety risks. Loss of these areas will result in lost training opportunities, reduced or loss of access to important range features such as complex bathymetry and range infrastructure, and ultimately degraded readiness and capability. It is unfeasible to limit access or activities within the southernmost edge of California Current, west of Tanner and Cortes Banks as Navy readiness would be impacted.

Furthermore, avoiding the area by relocating activities is not likely to significantly reduce impacts on Cuvier's beaked whales since almost all suitable deep water habitats greater than 800 m in Southern California could conceivably contain detections of Cuvier's beaked whales if monitored. The species is widely distributed within Southern California and across the Pacific.

Beaked whales in the Southern California portion of the HSTT Study Area may be exposed to sonar or other transducer's used during training and testing activities throughout the year. However, the quantitative analysis estimates exposures resulting in behavioral reactions or TTS, and a single PTS exposure from sonar and other transducers under either Alternative for all beaked whale species in the overall Southern California portion of the HSTT Study Area. Significant impacts on beaked whale natural behaviors or abandonment/avoidance of habitat due to training and testing with sonar and other transducers are unlikely to occur within beaked whale habitat.

Beaked whales in the Southern California portion of the HSTT Study Area may be exposed to sound from explosives used during training and testing activities throughout the year. However, the quantitative analysis estimates few exposures resulting in behavioral reactions or TTS, and a single PTS exposure from explosives under either Alternative for all beaked whale species in the overall Southern California portion of the HSTT Study Area. PTS could have minor long-term consequences for an individual; however, it is unlikely to have any long-term consequences for the species or stocks.

Despite the acknowledged difficulty in sighting beaked whales, Navy vessels are uniquely suited to detect marine mammals (forward bridge, dedicated lookouts) and are more likely to avoid strikes (highly maneuverable) and Navy sailors receive training specifically intended to sharpen their ability to sight marine mammals. Furthermore, all surface vessels use extreme caution and proceed at safe speeds so they can take proper and effective action to avoid a collision with any sighted object or disturbance, and

that the vessel can be stopped within a distance appropriate to the prevailing circumstances and conditions (see Section 2.3.3, Standard Operating Procedures).

While the Navy will continue to implement procedural mitigation measures throughout the Study Area, implementing new geographic based mitigation measures in addition to ongoing procedural mitigation measures within the southernmost edge of the California Current, west of Tanner-Cortes Bank would not be effective at reducing adverse impacts on beaked whales or other marine mammal populations. The Navy has been training and testing in and around the Catalina Basin with the same basic systems for over 40 years and there is no evidence of any adverse impacts having occurred. There are no indications that Navy training and testing has had any of adverse impacts on populations of Cuvier's beaked whales in Southern California.

The area identified as the southernmost edge of the California Current west of Tanner-Cortes Bank is adjacent to the Navy's most important anti-submarine and mine warfare training venue for unit level through integrated training where year-round access cannot be compromised. Geographic mitigation precluding, reducing or otherwise changing Navy's ongoing training and testing in this vital location would not reduce adverse impacts on any marine mammal population. Given that there is no evidence of significant impacts to the population of beaked whales anywhere in the Southern California portion of the HSTT Study Area and the uncertainty of current use by Cuvier's beaked whale of the area west of Tanner and Cortes Banks where general occurrence may not necessarily equate to biologically important areas. Furthermore, in consideration of the training and testing impact discussed above, additional geographic mitigation specifically for the area west of Tanner and Cortes Banks would not effectively balance a reduction of biological impacts with an acceptable level of impact on military readiness.

K.7.2.5 Tanner Canyon

K.7.2.5.1 Navy Requirements for Area Specific Training and Testing

The Cuvier's beaked whale habitat within the Tanner Canyon is located within the heavily used western portion of the HSTT Study Area, south of the instrumented Southern California Anti-submarine Warfare Range and Tanner-Cortes Bank and west of Fleet Training Area HOT, all of which are high value training venues.

Units routinely use this area (similar to areas within the Santa Catalina Basin to the east and the Santa Cruz Basin to the north) to set up complex anti-submarine warfare events prior to commencing into the Southern California Anti-submarine Warfare Range. Additionally:

- A shallow water minefield training range containing multiple surveyed bottomed and tethered mine shapes in shallow water is located adjacent to Tanner Canyon. Existing instrumentation includes submerged submarine positioning with Submerged Acoustic Navigation System buoys. Given the bathymetry of real world threats and the proximity to the Southern California Submarine Warfare Range deep water instrumented range (valued at $250M).
- An instrumented Shallow Water Training Range extension to the nearby Southern California Anti-submarine Warfare Range is planned for this area and has been approved by Deputy Assistant to the Secretary of the Navy and is supported by the 2009 Southern California Range Complex EIS/OEIS and Record of Decision. This Shallow Water Training Range extension supports U.S. Commander, Third Fleet long-standing requirement for a seamless deep-to-shallow water tracking and communication range. Installation is planned within the next decade.

- Aircraft, submarine and surface vessel assets train to protect a high value unit (carrier).
- Tanner Banks Mine Warfare Range is adjacent to this area.
- Anti-submarine warfare training and testing using active acoustic and explosive sonobuoys occurs in this area.

The bathymetry and bottom type provides a unique propagation environment in this area-shallow water surrounded by deep water basin- is similar to East China Sea, and provides as an analog to areas Navy assets would operate in when deployed.

K.7.2.5.2 Tanner Canyon Cuvier's Beaked Whales Mitigation Considerations

Tanner Canyon is adjacent to the Navy's most important anti-submarine and mine warfare training venue for unit level through integrated training where year-round access cannot be compromised. This area replicates areas encountered by surface ships in the Western Pacific today and includes areas they will be called on to operate in support of Pacific Command and Central Command in the future. There is no other area in the Southern California Range Complex with the bathymetry and sound propagation analog to seas where Navy conducts real operations that this training could relocate to.

Complete or even partial avoidance of Tanner Canyon would curtail Navy use of this critical and unique bathymetric feature, reducing the realism and effectiveness of training and testing activities. Furthermore, avoiding the area by relocating activities is not likely to significantly reduce impacts on Cuvier's beaked whales since almost all suitable deep water habitats greater than 800 m in Southern California could conceivably contain detections of Cuvier's beaked whales if monitored. The species is widely distributed within Southern California and across the Pacific.

Beaked whales in the Southern California portion of the HSTT Study Area may be exposed to sonar or other transducer's used during training and testing activities throughout the year. However, the quantitative analysis estimates exposures resulting in behavioral reactions or TTS, and a single PTS exposure from sonar and other transducers under either Alternative for all beaked whale species in the overall Southern California portion of the HSTT Study Area. Significant impacts on beaked whale natural behaviors or abandonment/avoidance of habitat due to training and testing with sonar and other transducers are unlikely to occur within beaked whale habitat.

Beaked whales in the Southern California portion of the HSTT Study Area may be exposed to sound from explosives used during training and testing activities throughout the year. However, the quantitative analysis estimates few exposures resulting in behavioral reactions or TTS, and a single PTS exposure from explosives under either Alternative for all beaked whale species in the overall Southern California portion of the HSTT Study Area. PTS could have minor long-term consequences for an individual; however, it is unlikely to have any long-term consequences for the species or stocks.

Despite the acknowledged difficulty in sighting beaked whales, Navy vessels are uniquely suited to detect marine mammals (forward bridge, dedicated lookouts) and are more likely to avoid strikes (highly maneuverable) and Navy sailors receive training specifically intended to sharpen their ability to sight marine mammals. Furthermore, all surface vessels use extreme caution and proceed at safe speeds so they can take proper and effective action to avoid a collision with any sighted object or disturbance, and that the vessel can be stopped within a distance appropriate to the prevailing circumstances and conditions (see Section 2.3.3, Standard Operating Procedures).

While the Navy will continue to implement procedural mitigation measures throughout the Study Area, implementing new geographic based mitigation measures in addition to ongoing procedural mitigation measures within Tanner Canyon would not be effective at reducing adverse impacts on beaked whales or other marine mammal populations. The Navy has been training and testing in and around the Tanner Canyon with the same basic systems for over 40 years and there is no evidence of any adverse impacts having occurred. There are no indications that Navy training and testing has had any of adverse impacts on populations of Cuvier's beaked whales in Southern California.

The area identified as Tanner Canyon is adjacent to the Navy's most important anti-submarine and mine warfare training venue for unit level through integrated training where year-round access cannot be compromised. In summary, geographic mitigation would not effectively balance a reduction of biological impacts with an acceptable level of impact on military readiness activities

K.7.2.6 Cuvier's Beaked Whale Habitat Areas Mitigation Assessment

Training and testing activities rely heavily on areas within the Southern California Range Complex because of their proximity to Naval Base San Diego, Naval Air Station North Island, Naval Base Point Loma, San Clemente Island, and Marine Corps Base Camp Pendleton as well as proximity to established ranges such as the Southern California Anti-Submarine Warfare Range, Tactical Maneuvering Areas, and minefields.

Avoiding the Cuvier's beaked whale habitat areas by relocating activities is not likely to significantly reduce impacts on Cuvier's beaked whale given almost all suitable deep water habitats greater than 800 m in Southern California could conceivably contain detections of Cuvier's beaked whales if monitored. The species is widely distributed within Southern California and across the Pacific. Furthermore, passive acoustic monitoring indicates that Cuvier's beaked whale are persisting in areas where the Navy has been conducting activities for long periods of time and provides evidence that the Navy's activities on the Southern California Anti-Submarine Warfare Range have not caused Cuvier's beaked whale to abandon or avoid that habitat (Falcone & Schorr, 2014b).

Only limited population information exists for beaked whales including numbers of animals, populations vs. subpopulations determination, and residency time for individual animals. The science of passive acoustic monitoring is perfectly positioned to answer some questions on occurrence and seasonality, but cannot as yet address all fundamental population parameters. Furthermore, while passive acoustic monitoring within Southern California has been ongoing for 28 years, with many sites funded by the Navy, not all sites have been consecutively monitored for each year. For instance, Site E was not monitored over 28 years. Site E was only monitored from September 2006 through July 2009 (slightly less than three years). During this period, only 14 percent of the monitoring days recorded had Cuvier's beaked whale detections (Baumann-Pickering et al., 2014). Site E was also a test site for 63 days from December 2010 through February 2011. For the latest period deployed, Site E was therefore only monitored for approximately 18 percent of a single year between 2010 and 2011. During this test of a passive acoustic array capable of tracking, Gassmann et al. (2015) reported detection of only three Cuvier's beaked whales over six separate encounter and time intervals of 10–33 minutes. In conclusion, this limited duration (< 3 years prior to 2010 and 63 days prior to 2011) may or may not be reflective of current beaked whale distributions within Southern California as of 2016 and into the future. Furthermore, using passive acoustic only for the detection of beaked whales without additional population parameters can only determine relative occurrence which could be highly variable over sub regions.

The Navy continues to fund additional passive acoustic field monitoring for beaked whales in Southern California, as well as research advancements for density derivation from passive acoustic data. Falcone et al. (2017) combined tagged data recorded from 16 tagged Cuvier's beaked whales during two different types of sonar. The tagged whales, in heavily used areas where the Navy is training and testing under current harassment authorizations, were opportunistically exposed to sonar throughout the tag deployments, lasting up to several months. The data included numerous exposures to ship and helicopter sonar at estimated source-to-whale distances as short as 1.8 km (horizontal distance). Whales responded primarily by extending the durations of their dives, surfacings, and foraging intervals, effects which increased with proximity. While deep dives, shallow dives, and intervals tended to be longer in association with mid-frequency active sonar, Falcone et al. (2017) reported no evidence of stranding or acute mortality. The tagged Cuvier's beaked whales did exhibit stronger behavior changes to helicopter sonar than to ship sonar at similar distances (and presumably much lower received levels), suggesting that source distance and usage context are likely as, if not more, important than received level alone for predicting effects. Cumulatively, considering all lines of evidence (population study, passive acoustic data) including parallel passive acoustic work that has not detected any change in beaked whale vocalizations rates across the past five years for the same group, while reacting to sonar, there are no indications of an overall significant individual risk or significant population risk. This study has been going on for almost 10 years now, and continues to be ongoing.

Beaked whales, including Cuvier's beaked whales, are challenging to observe at sea due to their cryptic, skittish behavior, low profile, and small, inconspicuous blow at the water's surface, making them barely visible to observers. While Navy vessels operate differently from commercial vessels in ways that are important to prevent whale collisions, observing beaked whales at the surface by personnel assigned to stand watch at all times, day and night, when a ship or surfaced submarine is moving through the water (underway), may be difficult—making beaked whales more vulnerable to vessel strikes than other large whales.

Despite the acknowledged difficulty in sighting beaked whales, Navy vessels are uniquely suited to detect marine mammals (forward bridge, dedicated lookouts) and are more likely to avoid strikes (highly maneuverable) and Navy sailors receive training specifically intended to sharpen their ability to sight marine mammals. Furthermore, all Navy vessels use extreme caution and proceed at a safe speed so they can take proper and effective action to avoid a collision with any sighted object or disturbance as standard operating procedures in addition to mitigation measures described in Chapter 5 (Mitigation) to limit the interaction between Navy vessels and marine mammals, further reducing the potential for disturbance and direct strike to marine mammals. Existing protection measures have been very effective in mitigating the potential for ship strikes both within the HSTT Study Area as well as worldwide. Accordingly, ship strikes by naval vessels are exceedingly rare events. Seasonal restrictions/limitations on vessel speed would unnecessarily complicate the Navy's ability to conduct routine activities and would prevent vessel commanders from operating as necessary to ensure safety of navigation.

Overall, geographic mitigation for beaked whales in Southern California would not be effective in reducing adverse impacts to beaked whale populations (given multiple indications that none are occurring) and would not be practicable to implement because of the significant impacts to safety and the effectiveness of Navy training and testing activities.

K.7.2.7 Northern Catalina Basin and the San Clemente Basin

This area, also characterized in the public comments as "southern-central waters of the Bight," was suggested as biologically important habitat for Perrin's beaked whale. Catalina Basin is described in Section K.7.2.2 (Catalina Basin). The northern portion of the basin is located west of Santa Catalina Island and the San Pedro Channel, which serves the ports of Long Beach and Los Angeles (Figure K.7-1). The San Clemente Basin extends south from San Clemente Island for approximately 60 km beyond the United States – Mexico border. The basin is deeper than 1,800 m in many places and is interrupted by several banks that rise to between 1,000 and 500 m from the surface (National Oceanic and Atmospheric Administration, 2013).

Perrin's beaked whale is known only from five stranded specimens along the California coastline from 1975 to 1997 (Dalebout et al., 2002; MacLeod et al., 2006) These strandings include two at U.S. Marine Corps Base Camp Pendleton (33°15' N, 117°26' W), and one each at Carlsbad, (33°07' N, 117°20' W), Torrey Pines State Reserve (32°55' N, 117°15' W), and Monterey (36°37' N, 121°55' W) (Dalebout et al., 2002; Mead, 1981). These stranded animals were previously identified as Hector's beaked whale but have been reclassified as Perrin's beaked whale (Dalebout et al., 2002; Mead, 1981, 1989). While this stranding pattern suggests an eastern North Pacific Ocean distribution, the actual extent of the Perrin's beaked whale distribution is unknown (Dalebout et al., 2002). It is likely the species occurs primarily in the eastern North Pacific where depths exceed 1,000 m (MacLeod & Mitchell, 2006). *Mesoplodon* beaked whales (to which the Perrin's beaked whale species belongs) were not detected during 15 aerial surveys conducted in the Southern California Range Complex from 2008 through 2012 (Smultea, 2014). Acoustic monitoring from devices located at seven sites in the Southern California Bight (across a broad area stretching of from Santa Cruz Island to an open ocean area south of San Clemente Island) documented the presence of a beaked whale-like frequency modulated pulse that may possibly be produced by Perrin's beaked whale since it is otherwise unidentified (Baumann-Pickering et al., 2015b; Debich et al., 2015b {Baumann-Pickering, 2014 #7339}).

The references provided in the comments (Baumann-Pickering et al., 2014; Baumann-Pickering et al., 2015b) do not mention the subject of "biologically important habitat" and referencing that research does not indicate that the findings provide support for the area as being "biologically important." Part of the rationale expressed in the comment for the area needing protection was that Perrin's beaked whale, "...has been found nowhere outside Southern California and may be unique to the region." The comments assertion fails to consider that there has been little if any research in the eastern North Pacific south of the Mexico border and outside of the areas where Navy-funded research in the Southern California Range Complex has provided most of the acoustic monitoring data from the Southern California Bight. The species is only known from strandings decades ago so there can be no certainty that the Southern California Bight or that the northern Catalina Basin and the San Clemente Basin represents remarkable or otherwise important habitat for the species. Furthermore, the public comments do not provide any identified impacts on the Perrin's beaked whales that the proposed "time-area management" and "restrictions" would be aimed to address.

K.7.2.7.1 Navy Requirements for Area-Specific Training and Testing

The Northern Catalina Basin and waters southeast of Santa Catalina Island are located within the heavily used eastern portion of the Southern California Range Complex. Anti-submarine warfare such as strait transits (transit within constricted space between two land masses, San Clemente and Santa Catalina Islands) occur here. As this area is in close proximity to San Diego and the instrumented Southern California Anti-submarine Warfare Range, it is an important venue for unit level training as well as more

complex anti-submarine warfare events, which migrate into the Southern California Anti-submarine Warfare Range or support amphibious landings at the Camp Pendleton Amphibious Assault Area. Range infrastructure on San Clemente Island, such as divert airfields, supports safe and effective training within this area. Explosives are not typically used within these areas.

- The Santa Catalina Basin remains a unique, critical training area used for strait transit training during integrated events incorporating surface, air, subsurface, and unmanned aerial systems.
- The basin is important because of the extensive, long-term support infrastructure established on San Clemente Island.
- The area overlaps three (of eight) sections of the federal Safety Zone (33 Code of Federal Regulations 165.1141). Safety zone rulemaking designations not easily altered.
- The area is important for unit level training because of its proximity to San Diego Bay and Southern California Anti-submarine Warfare Range.

Situated between San Clemente Island and Santa Catalina Island, the Santa Catalina Basin underlies a restricted path for surface vessel maneuver, while at the same time providing excellent bathymetric configurations for submarines to mask their presence during strait transit training. In addition, proximity to the UHF relay stations on San Clemente Island is mandatory for operating unmanned aerial systems in conjunction with strait transit training.

K.7.2.7.2 Northern Catalina Basin and Waters Southeast of Catalina Island Perrin's Beaked Whale Habitat Mitigation Considerations

Complete avoidance of any portion of the Santa Catalina Basin and the waters southeast Catalina Island would be unfeasible and could result in the expenditure of potentially up to an additional 40 NM transit time and fuel costs to relocate the events and could severely degrade critical pre-deployment training in preparation for real world threats to naval personnel and assets. To move the activities to other locations could result in a greater concentration of activity in areas that already have heavy training schedules.

Beaked whales in the Southern California portion of the HSTT Study Area may be exposed to sonar or other transducer's used during training and testing activities throughout the year. However, the quantitative analysis estimates exposures resulting in behavioral reactions or TTS, and a single PTS exposure from sonar and other transducers under either Alternative for all beaked whale species in the overall Southern California portion of the HSTT Study Area. Significant impacts on beaked whale natural behaviors or abandonment/avoidance of habitat due to training and testing with sonar and other transducers are unlikely to occur within beaked whale habitat.

Beaked whales in the Southern California portion of the HSTT Study Area may be exposed to sound from explosives used during training and testing activities throughout the year. However, the quantitative analysis estimates few exposures resulting in behavioral reactions or TTS, and a single PTS exposure from explosives under either Alternative for all beaked whale species in the overall Southern California portion of the HSTT Study Area. PTS could have minor long-term consequences for an individual; however, it is unlikely to have any long-term consequences for the species or stocks.

Beaked whales, including Perrin's beaked whales, are challenging to observe at sea due to their cryptic, skittish behavior, low profile, and small, inconspicuous blow at the water's surface, making them barely visible to observers. While Navy vessels operate differently from commercial vessels in ways that are

important to prevent whale collisions, observing beaked whales at the surface by personnel assigned to stand watch at all times, day and night, when a ship or surfaced submarine is moving through the water (underway), may be difficult—making beaked whales more vulnerable to vessel strikes than other large whales.

Despite the acknowledged difficulty in sighting beaked whales, Navy vessels are uniquely suited to detect marine mammals (forward bridge, dedicated lookouts) and are more likely to avoid strikes (highly maneuverable) and Navy sailors receive training specifically intended to sharpen their ability to sight marine mammals. Furthermore, all Navy vessels use extreme caution and proceed at a safe speed so they can take proper and effective action to avoid a collision with any sighted object or disturbance as standard operating procedures in addition to mitigation measures described in Chapter 5 (Mitigation) to limit the interaction between Navy vessels and marine mammals, further reducing the potential for disturbance and direct strike to marine mammals. Existing protection measures have been very effective in mitigating the potential for ship strikes both within the HSTT Study Area as well as worldwide. Unlike commercial vessels, ship strikes by naval vessels are exceedingly rare events. Seasonal restrictions/limitations on vessel speed would unnecessarily complicate the Navy's ability to conduct routine activities and would prevent vessel commanders from operating as necessary to ensure safety of navigation.

While the Navy will continue to implement procedural mitigation measures throughout the Study Area, implementing new geographic based mitigation measures within northern Catalina Basin and waters southeast of Catalina Island would not be effective at reducing adverse impacts on beaked whales or other marine mammal populations. The Navy has been training and testing in and around northern Catalina Basin and waters southeast of Catalina Island with the same basic systems for over 40 years and there is no evidence of any adverse impacts having occurred. There are no indications that Navy training and testing has had any of adverse impacts on populations of beaked whales in Southern California. The main source of anthropogenic noise in the northern Catalina Basin and waters southeast of Catalina Island is associated with commercial vessel traffic concentrated into the northbound and southbound lanes of the San Pedro Channel that runs next to Catalina Island and leads to and from the ports of Los Angeles/Long Beach.

The waters in and around northern Catalina Basin and waters southeast of Catalina Island are critical to the Navy’s training and testing mission and so it is unfeasible to limit or reduce access or preclude activities within that water space in the Southern California portion of the HSTT Study Area. In summary, geographic mitigation would not effectively balance a reduction of biological impacts with an acceptable level of impact on military readiness activities.

K.7.2.7.3 San Clemente Basin

K.7.2.7.3.1 Navy Requirements for Area Specific Training and Testing

The San Clemente Basin includes the largest concentration of air-to-surface live-fire/munitions training in the Southern California Range Complex which is scheduled in the Fleet Training Area HOT. The basin encompasses a significant portion of Fleet Training Area Hot and the Quick Draw Areas (QDA 1-4). Air-to-Surface Gunnery Exercises are conducted by Naval Air Station North Island rotary-wing aircraft against stationary targets because of the close proximity to the San Diego Fleet Concentration area. The San Clemente Basin is located within the W-291 area which provides aircraft separation, and the ability to de-conflict surface vessel with non-participating entities (military or civilian). Additionally, its close

location allows for rapid deployment of Naval Air Station North Island based search-and-rescue assets in the case of a downed helicopter.

K.7.2.7.4 San Clemente Basin Mitigation Considerations

Segmenting large areas, such as the San Clemente Basin, within the heavily utilized portion of the Southern California Range Complex for air-to-surface live-fire/munitions training would result in degrading high value training. This would also result in unnecessary crowding of inherently hazardous naval activities into ever decreasing available sea space, potentially increasing safety risks.

Complete or even partial avoidance of the San Clemente Basin would curtail Navy use of this critical training area. Furthermore, avoiding the area by relocating activities is not likely to significantly reduce impacts on beaked whales since almost all suitable deep water habitats greater than 800 m in Southern California could conceivably contain detections of beaked whales if monitored.

Beaked whales in the Southern California portion of the HSTT Study Area may be exposed to sonar or other transducer's used during training and testing activities throughout the year. However, the quantitative analysis estimates exposures resulting in behavioral reactions or TTS, and a single PTS exposure from sonar and other transducers under either Alternative for all beaked whale species in the overall Southern California portion of the HSTT Study Area. Significant impacts on beaked whale natural behaviors or abandonment/avoidance of habitat due to training and testing with sonar and other transducers are unlikely to occur within beaked whale habitat.

Beaked whales in the Southern California portion of the HSTT Study Area may be exposed to sound from explosives used during training and testing activities throughout the year. However, the quantitative analysis estimates few exposures resulting in behavioral reactions or TTS, and a single PTS exposure from explosives under either Alternative for all beaked whale species in the overall Southern California portion of the HSTT Study Area. PTS could have minor long-term consequences for an individual; however, it is unlikely to have any long-term consequences for the species or stocks.

Despite the acknowledged difficulty in sighting beaked whales, Navy vessels are uniquely suited to detect marine mammals (forward bridge, dedicated lookouts) and are more likely to avoid strikes (highly maneuverable) and Navy sailors receive training specifically intended to sharpen their ability to sight marine mammals. Furthermore, all surface vessels use extreme caution and proceed at safe speeds so they can take proper and effective action to avoid a collision with any sighted object or disturbance, and that the vessel can be stopped within a distance appropriate to the prevailing circumstances and conditions (see Section 2.3.3, Standard Operating Procedures).

While the Navy will continue to implement procedural mitigation measures throughout the Study Area, implementing new geographic based mitigation measures in addition to ongoing procedural mitigation measures within the San Clemente Basin would not be effective at reducing adverse impacts on beaked whales or other marine mammal populations. The Navy has been training and testing in and around the San Clemente Basin with the same basic systems for over 40 years and there is no evidence of any adverse impacts having occurred. There are no indications that Navy training and testing has had any of adverse impacts on populations of Cuvier's beaked whales in the San Clemente Basin or any of Southern California.

The area identified as San Clemente Basin is adjacent to the Navy's most important anti-submarine and mine warfare training venue for unit level through integrated training where year-round access cannot be compromised. Geographic mitigation precluding, reducing or otherwise changing Navy's ongoing

training and testing in this vital location would not reduce adverse impacts on any marine mammal population. In summary, geographic mitigation would not effectively balance a reduction of biological impacts with an acceptable level of impact on military readiness activities.

K.7.2.8 Waters Just off the Mainland Shelf, Between the 200 m and 1,000 m Isobaths

Public comments recommended that for the Southern California portion of the HSTT Study Area, "the waters between the 200 m and 1000 m isobaths[2] be assessed for time-area management so that, at minimum, ship-strike risk-reduction measures for fin whales can be implemented during the months of November through February." The area referred to is an expansive area including waters over much of the continental shelf and the seaward extension of the shelf referred to as the continental borderland where numerous islands and banks are interspersed resulting in a complex and irregular bathymetry (Figure K.7-1). Water depth ranges from 0 m along the shoreline of islands to well over 1,000 m in adjacent ocean basins (Kennett, 1982; National Oceanic and Atmospheric Administration, 2013). Delineating specific areas within the continental borderland that range from 200 m to 1,000 m in depth would create a disconnected array of areas isolated between islands, shallow banks, and deep water basins.

The comment's suggested use of depth as a metric to be considered for ship-strike risk-reduction measures is not supported by science. The basis for the suggested depth distribution was research where sampling of the outer waters of the Southern California Bight did not occur consistently in relationship to the nearshore waters (Falcone & Schorr, 2014a). Tagging and survey data have, however, shown fin whales to be present at distances of up to 356 km from the mainland coast (Falcone & Schorr, 2014a) and over a much broader range of depths than 200–1,000 m (Barlow, 2016; Falcone & Schorr, 2014a; Mate et al., 2015; Mate et al., 2016). This is consistent with a previous review of the scientific data regarding fin whale behavior and distribution, which did not establish any biologically important areas for fin whales in southern California or anywhere along the U.S. West Coast, "… due to limited or conflicting information" (Calambokidis et al., 2015).

One comment contends that fin whales are "at particular risk of ship-strike on the naval range" given they feed at shallow depths and "they have been known to be struck by vessels in the recent past." Rockwood et al. (2017) have suggested that death from vessel collisions may be a significant impediment to further population growth and recovery for blue whales, especially where the risk is highest on the U.S. west coast in the shipping lanes serving San Francisco and ports of Los Angeles/Long Beach. In general, there is nothing inherently different in the waters off the Southern California that would result in fin whales being "at particular risk" within the Southern California portion of the HSTT Study Area from Navy activities. There is, however, a traffic separation scheme that overlaps the northeastern corner of the Study Area and is used by commercial vessels to coordinate northbound and southbound travel through the San Pedro Channel and to the very busy ports of Long Beach and Los Angeles. The separation scheme concentrates commercial vessel traffic into designated lanes for safe transit. Fin whales that enter those lanes may be at higher risk of a vessel strike due to the concentration of large commercial vessels into a relatively confined route. Navy vessels engaged in

[2] Also referred to in the scoping comment as, "… waters just off the mainland shelf, between the 200 m and 1000 m isobaths."

training and testing activities do not use the traffic separation scheme and would not contribute to the concentration of large vessels in the area.

While fin whales do occur in the Southern California portion of the HSTT Study Area, their distribution is certainly not limited to Southern California. Between 2008 and 2015, 73 fin whales were satellite tagged to track movements over weeks to months (Falcone & Schorr, 2014a; Mate et al., 2015; Mate et al., 2016). The tagged fin whales ranged up the U.S. West Coast as far north as the Olympic Peninsula, Washington and south as far as Baja California, Mexico. For the southern California portion of the HSTT Study Area, the tagging data indicated that the whales spent more time in the northern portion of the Southern California Bight, to the north of the Southern California Range Complex, than in areas to the south (Falcone & Schorr, 2014a; Mate et al., 2015; Mate et al., 2016). This distribution pattern is consistent with survey-based estimates of fin whale densities off the Southern California coast, which indicate that the highest seasonal density occurs during summer and fall in the area south of the Channel Islands (San Miguel, Santa Rosa, and Santa Cruz islands) and west of San Nicolas Island, which is at the northern boundary of the Southern California portion of the HSTT Study Area (Becker et al., 2016; Calambokidis et al., 2015).

The same comment also specified a five-month timeframe (November through February) over which geographic-based measures should be considered. This timeframe seems out of synch with the seasonal distribution of fin whales off Southern California, as described in multiple studies (Debich et al., 2015a; Falcone & Schorr, 2014a; Širović et al., 2015; Širović et al., 2016; Smultea, 2014). Research and monitoring off Southern California indicates a year-round presence of fin whales in the region across seasons and years, with the highest densities occurring in summer and fall (Becker et al., 2016; Calambokidis et al., 2015). Between 1992 and 2012, 49 fin whales were re-sighted off southern California in up to five different years and across multiple seasons (Falcone et al., 2011; Falcone & Schorr, 2014a).

New research by Širović et al. (2017) supports a hypothesis that between the Gulf of California and Southern California, there could be up to four distinct sub-populations based on fin whale call types, including a Southern California resident population. There is also evidence that there can be both sub-population shifts and overlap within Southern California (Širović et al., 2017). Scales et al. (2017) also postulated two Southern California sub-populations of fin whales based on satellite tagging and habitat modeling. Scales et al. (2017) stated that some fin whales may not follow the typical baleen whale migration paradigm, with some individuals found in both warm, shallow nearshore waters < 500 m, and deeper cool waters over complex seafloor topographies. Collectively, the author's spatial habitat models with highest predicted occurrence for fin whales cover the entire core training and testing portion of the Southern California portion of the HSTT Study Area, not just areas between 200 and 1000 m. Results from Navy-funded long-term satellite tagging of fin whales in Southern and Central California still shows some individual fin whales engage in wide-ranging movements along the U.S. West Coast, as well as large daily movements well within subareas (Mate et al., 2017).

In support of further refining the science on Southern California fin whales, Falcone and Schorr (2014a) examined fin whale movements through photo ID and short-to-medium term (days-to-several weeks) satellite tag tracking under funding from the Navy. The authors conducted small boat surveys from June 2010 through January 2014, approximately three and a half years. Of interest in terms of the comment and the 200–1000 m isobaths occurrence, more fin whale tag locations were reported off the Palos Verdes Peninsula and off of the Los Angeles/Long Beach commercial shipping ports in fall, both areas north of and outside of the Navy's Southern California Range Complex. Compared to the above areas,

there were not as many tag locations in the similar isobaths region off San Diego associated with the Navy range area. Falcone and Schorr (2014) did document an apparent inshore-offshore distribution between winter-spring and summer-fall. Given the apparent resident nature of some fin whales in Southern California as discussed in Falcone and Schorr (2014a), Scales et al. (2017), and Širović et al. (2017), it remains uncertain if the inshore-offshore seasonal pattern as well as sub-population occurrence will persist into the future, or if fin whales will change distribution based on oceanographic impacts on available prey (e.g., El Nino, climate change). The efforts from Falconne and Schorr on fin whales began in 2010 and are planned to continue for the next several years under Navy monitoring funding to further refine fin whale population structure and occurrence within Southern California.

Based on a similar comment received on the Draft EIS/OEIS citing Širović et al. (2015)), it should be noted that the data from the various single bottom-mounted passive acoustic devices used in the analysis are not continuous and have various periodicities for which data have been collected. Many of these devices are purposely placed in 200-1000 m of water. Given these are point sources of data, they may or may not be indicative of fin whale calling or presence at other locations within Southern California without devices. Passive acoustic analysis is only useful for those individuals that are calling and may not indicate total population occurrence. Low-frequency fin whale calls by their very nature have relatively long underwater propagation ranges so detections at a single device could account for individuals 10 to 50 miles away if not further depending on local propagation conditions. Širović et al. (2015) acknowledge in discussing their data biases, that their use of "call index" may best indicated a period of peak calling. But fin whales produce multiple call types depending on behavioral state. Based on technology limitations, some fin whale call types were not included in Širović et al. (2015). Furthermore, the research used as the basis for the comment was funded by the Navy to develop baseline information for the areas where Navy trains and tests and was by no means designed to or otherwise intended as a representative sample of waters off California or the entire habitat of the fin whale population in the area. It is not correct to assume detected vocalizations (a "call index") reported in Širović et al. (2015) for fin whales equates with where fin whales are aggregated in the Southern California Bight. For example, the acoustic monitoring data did not pick up or otherwise correspond to the observed seasonal distribution shift of fin whales indicated by visual survey data covering the same time periods (Campbell et al., 2015; Douglas et al., 2014). Širović et al. (2015) make no such claim of aggregations during the winter months but instead compare call index rates and state that the purpose for the paper was to demonstrate that passive acoustics can be a powerful tool to monitor population trends, not relative abundances.

While fin whales may have been struck by commercial or other non-Navy vessels "in the recent past" (details regarding where, when, or by what kind of vessel resulted in the fin whale strike mentioned in the comment were not provided), there has not been a strike on a fin whale by a U.S. Navy vessel in the Southern California portion of the HSTT Study Area since 2009. Neither of these Navy fin whale strike locations were close to shore (both >50–60 NM from shore), or associated with coastal shipping lanes. Based on an analysis of Navy ship traffic in HSTT between 2011 and 2015, median speed of all Navy vessels within Southern California is typically already low, with median speeds between 5-12 knots (Mintz, 2016). This includes areas within and outside of 200-1000m within Southern California, and slowest speeds closer to the coast. And as presented in the EIS/OEIS, fin whales are present off all the waters of Southern California year-round (Širović et al., 2015; Širović et al., 2017); therefore implementing speed restrictions within 200–1000m is unwarranted given the wide range of fin whale movements along the U.S. West Coast including areas within and outside of 200-1000 m contours,

including some large scale daily movements within regional areas as documented from Navy-funded satellite tagging.

Even though there has been a documented increase in the fin whale population inhabiting the area (Barlow, 2016; Moore & Barlow, 2011; Smultea, 2014), there has been no increase in the number of whale strikes. Implementation of the Navy's Marine Species Awareness Training beginning in 2006, along with other existing Navy mitigation measures intended to ensure that vessels avoid whales, may have contributed to the reduction of strikes on large whales by Navy vessels in the last decade and to fin whales in the area since 2009.

K.7.2.8.1 Navy Requirements for Fin Whale Area-Specific Training and Testing

Portions of the area identified in the comment as fin whale habitat in the waters between the 200 m and 1,000 m isobaths, extend over heavily utilized areas within the Southern California portion of the HSTT Study Area and encompass many of the primary training sites within the Southern California Range Complex. Spatially, the training areas encompassed by the fin whale habitat areas with potential higher abundance provide critical capabilities necessary to train naval forces. They include the following: the instrumented Southern California Anti-submarine Warfare Range; established helicopter sonar dipping areas, proximate to Naval Air Station North Island, Tanner-Cortes Bank, a sonobuoy test area, a minefield, the Camp Pendleton Amphibious Assault Area, Fleet Training Area HOT, and other complex bathymetric features necessary to challenge anti-submarine warfare skills.

The waters offshore of Southern California have supported naval training and testing for decades and are used almost daily by naval forces to conduct all phases of training, from basic unit level events to complex major training exercises. Navy readiness depends on access to the training areas in close proximity to Fleet concentration areas. Segmenting large areas within the heavily utilized Southern California portion of the HSTT Study Area for training and testing would result in degrading high value training and testing. This would also result in unnecessary crowding of inherently hazardous naval activities into ever decreasing available sea space, potentially increasing safety risks.

K.7.2.9 Fin Whale Area Mitigation Assessment

Based on years of NMFS and Navy monitoring in Southern California, there appears to be a constant presence of fin whales in the region across seasons and years. Of interest, in terms of the 200-1,000 m isobaths, more tagged reporting locations occurred off the Palos Verdes Peninsula and the Los Angeles/Long Beach commercial shipping ports in fall, with both areas north of and outside of the Southern California portion of the HSTT Study Area. Compared to the fin whale habitat areas found north of the HSTT Study Area, there were not as many tag locations in the similar isobaths region off San Diego associated with the Navy range area.

The Navy will continue to implement procedural mitigation measures throughout the Study Area, although implementing new geographic based mitigation measures in addition to procedural mitigation measures within "waters just off the mainland shelf between the 200 m and 1,000 m isobaths" would not be practicable to implement without impeding military readiness. Mitigation area measures are not likely to be effective at reducing adverse impacts on the fin whale population given multiple lines of evidence that the population is thriving and no population level impacts are occurring (National Marine Fisheries Service, 2015). The Navy has been training and testing in the waters of Southern California with the same basic systems for over 40 years and there is no evidence of any adverse impacts having occurred. There has been a documented increase in the fin whale population inhabiting the area (Barlow, 2016; Moore & Barlow, 2011; Smultea, 2014). Moore and Barlow (2011) predicted continued

increases in fin whale numbers over the next decade, and suggested that fin whale densities are reaching "current ecosystem limits." Those findings and the continued trend in the population is consistent with the highest-yet abundances of fin whales in the most recent 2014 survey (Barlow, 2016).

The only Navy vessel strikes to any large whale species over the last ten years were two fin whales struck in 2009. Neither strike occurred close to shore. Each occurrence was <50 NM from shore and not within the 200 to 1,000 m isobaths, nor were they associated with coastal shipping lanes. There have been no Navy vessel strikes to fin whales in Southern California since those occurring in 2009 and since the Navy began implementing the Marine Species Awareness Training. Existing protection measures have been very effective in mitigating the potential for ship strikes both within the Southern California portion of the HSTT Study Area as well as worldwide. All surface vessels use extreme caution and proceed at safe speeds so they can take proper and effective action to avoid a collision with any sighted object or disturbance, and that the vessel can be stopped within a distance appropriate to the prevailing circumstances and conditions. Unlike commercial vessels, Navy vessels are uniquely suited to detect marine mammals (forward bridge, dedicated lookouts) and are more likely to avoid strikes (highly maneuverable) and Navy sailors receive training specifically intended to sharpen their ability to sight marine mammals. Accordingly, ship strikes by naval vessels are exceedingly rare events. Seasonal restrictions/limitations on vessel speed would unnecessarily complicate the Navy's ability to conduct routine activities and would prevent vessel commanders from operating as necessary to ensure safety of navigation.

All surface vessels use extreme caution and proceed at safe speeds so they can take proper and effective action to avoid a collision with any sighted object or disturbance, and that the vessel can be stopped within a distance appropriate to the prevailing circumstances and conditions (see Section 2.3.3, Standard Operating Procedures, in Chapter 2, Description of Proposed Action and Alternatives).

As discussed in Section K.2.3.4 (Awareness Notification Messages), the Navy will issue awareness notification messages from November to May to alert ships and aircraft to the possible presence of concentrations of fin whales out to 20 NM within the Southern California portion of the HSTT Study Area. In order to maintain safety of navigation and to avoid interactions with large whales during transits, vessels will be instructed to remain vigilant to the presence of this whale species, that when concentrated seasonally, may become vulnerable to vessel strikes. Lookouts will use the information from the awareness notification messages to assist their visual observations of mitigation zones and to aid in implementing procedural mitigation.

The Southern California portion of the HSTT Study Area is vital to Navy training and testing. Geographic mitigation precluding, reducing or otherwise changing Navy's ongoing training and testing in this broad portion off Southern California would have an unacceptable level of impact on military readiness activities when balanced against the effectiveness in reducing biological impacts to fin whales. However, fin whales occurring within the San Diego Arc Planning Awareness (Figure K.2-1) and Cautionary Areas (Figure K.2-1) from June 1 to October 31, would be afforded some additional protections from the limited use of surface ship hull-mounted mid-frequency active sonar or explosives during anti-submarine major training exercises, as discussed in Section K.2.2 (Mitigation Areas to be implemented).

K.7.2.10 Summary of Southern California Public Comment Mitigation Areas Assessment

There has been over a decade of research focused on investigating Navy impacts on beaked whales, particularly within the Navy's Southern California Range Complex. As noted in the sections above, several years of research indicate that beaked whales seem to occur at higher densities and have a

longer than expected residency on the Navy's training and testing areas off Southern California. Given that Cuvier's beaked whales routinely undertake extensive movements of several hundred kilometers, beaked whales reacting to and leaving the vicinity of a Navy training or testing activity would seem to be within the variation of their otherwise normal movements as documented by tagging data.

These results do not support the need for "habitat-based management" on the Navy's ranges to address impacts on the Cuvier's beaked whale population given that no population-level impacts from Navy training and testing activities are evident. Documented identification and multi-year residency by over 100 individual Cuvier's beaked whales in the Southern California Range Complex seems to counter the notion that the whales are affected by Navy activities and argues against the suggestion that implementing some type of habitat-based management would benefit the population of Cuvier's beaked whales in southern California waters. The continued presence of the whales supports an assessment that the Navy's ongoing mitigation measures are effective and that additional mitigation as suggested in the comments is not merited.

Navy vessels represent only a very small portion of the total amount of (primarily commercial) vessel traffic in the vicinity of the Catalina Basin, Santa Cruz Basin, and the San Pedro Channel transiting over these areas to access the ports of Los Angeles and Long Beach. Therefore, any additional mitigation by the Navy (beyond their ongoing mitigation measures) would likely be insignificant compared to the commercial stressors. In addition, most likely these species have become habituated to high levels of ambient sound within the vicinity of areas of high vessel traffic.

Perrin's beaked whale is known only from a few strandings spanning decades, so there can be no certainty that the Southern California Bight or the northern Catalina Basin and the San Clemente Basin represent biologically important habitat for the species. Without more data on the habitat preferences and seasonal occurrence of Perrin's beaked whales it is unreasonable to assume that some type of seasonal and geographic mitigation would be effective at protecting the species. There has not been a vessel strike on a fin whale by a U.S. Navy vessel in the Southern California portion of the HSTT Study Area since 2009. Even though there has been a documented increase in the fin whale population inhabiting the area (Barlow, 2016; Moore & Barlow, 2011; Smultea, 2014), there has been no increase in the number of whale strikes. Implementation of the Navy's Marine Species Awareness Training, along with other existing Navy mitigation measures intended to ensure that vessels avoid whales, correlates well with the reduction of strikes on large whales by Navy vessels in the last decade and to fin whales in the area since 2009. It is not clear how additional geographic and seasonal mitigation broadly covering areas where depths range from 200 m to 1,000 m would be implemented, nor is it clear how it would increase the effectiveness of ongoing mitigation measures.

Overall, the various suggested geographic mitigation areas in the waters of Southern California would not be effective in reducing impacts to marine species given that scientific data and research indicates there are no known adverse impacts on populations inhabiting those waters from Navy activities. The Navy balanced the need for these areas for training and testing with the importance of the areas for these species and determined that implementing migration areas across broad regions within the Southern California portion of the HSTT Study Area, would not be practicable to implement because of the existing Navy infrastructure and training areas in the vicinity of the adjacent Naval Base and other Department of Defense facilities in the Southern California area.

REFERENCES

Abramson, L., S. Polefka, S. Hastings, and K. Bor. (2011). *Reducing the Threat of Ship Strikes on Large Cetaceans in the Santa Barbara Channel Region and Channel Islands National Marine Sanctuary: Recommendations and Case Studies* (Marine Sanctuaries Conservation Series). Silver Spring, MD: U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Ocean Service, Office of Ocean and Coastal Resource Management, Office of National Marine Sanctuaries.

Aguilar, A. (2000). Population biology, conservation threats and status of Mediterranean striped dolphins (*Stenella coeruleoalba*). *Journal of Cetacean Research and Management, 2*(1), 17–26.

Albertson, G. R., M. Oremus, R. W. Baird, K. K. Martien, M. M. Poole, R. L. Brownell, F. Cipriano, and S. Baker. (2011). Staying close to home: Mitochondrial DNA analysis reveals insular population structure for the pelagic dolphin *Steno bredanensis*.

Ampela, K., J. R. Mobley, Jr., M. W. Richie, J. A. Rivers, and R. K. Uyeyama. (2015). *Aerial and Ground-based Shoreline Surveys for Marine Mammals and Sea Turtles in the Hawaii Range Complex: SCC 12-13 August 2013* (Prepared for Naval Facilities Engineering Command Pacific for Commander, U.S. Pacific Fleet under Contract No. N62470-10-D-3011, CTO KB22, issued to HDR, Inc.). Honolulu, HI: HDR, Inc.

Aquatic Mammals. (2015a). Supplemental tables: Biologically important areas for cetaceans within U.S. Waters – Hawaii region. *Aquatic Mammals, 41*(1), 33–44.

Aquatic Mammals. (2015b). Supplemental tables: Biologically important areas for selected cetaceans within U.S. Waters – West Coast region. *Aquatic Mammals, 41*(1), 30–32.

Aquatic Mammals. (2015c). Letter of Introduction to the Biologically Important Areas Issue. *Aquatic Mammals, 41*(1), 128.

Aschettino, J. M., R. W. Baird, D. J. McSweeney, D. L. Webster, G. S. Schorr, J. L. Huggins, K. K. Martien, S. D. Mahaffy, and K. L. West. (2012). Population structure of melon-headed whales (*Peponocephala electra*) in the Hawaiian Archipelago: Evidence of multiple populations based on photo identification. *Marine Mammal Science, 28*(4), 666–689.

Baird, R. (2013). Odontocete Cetaceans Around the Main Hawaiian Islands: Habitat Use and Relative Abundance from Small-Boat Sighting Surveys. *Aquatic Mammals, 39*(3), 253–269.

Baird, R. W., D. J. McSweeney, D. L. Webster, A. M. Gorgone, and A. D. Ligon. (2003). *Studies of odontocete population structure in Hawaiian waters: Results of a survey through the main Hawaiian Islands in May and June 2003*. Seattle, WA: National Oceanic and Atmospheric Administration.

Baird, R. W., D. J. McSweeney, A. D. Ligon, and D. L. Webster. (2004). *Tagging feasability and diving of Cuvier's beaked whales (Ziphius cavirostris) and Blainville's beaked whales (Mesoplodon densirostris) in Hawai'i*. La Jolla, CA: U.S. Department of Commerce.

Baird, R. W., D. L. Webster, D. J. McSweeney, A. D. Ligon, and G. S. Schorr. (2005). *Diving Behavior and Ecology of Cuvier's (Ziphius cavirostris) and Blainville's Beaked Whales (Mesoplodon densirostris) in Hawaii*. La Jolla, CA: U.S. Department of Commerce.

Baird, R. W., G. S. Schorr, D. L. Webster, D. J. McSweeney, and S. D. Mahaffy. (2006). *Studies of Beaked Whale Diving Behavior and Odontocete Stock Structure in Hawaii in March/April 2006*. Olympia, WA: Cascadia Research Collective.

Baird, R. W., D. L. Webster, S. D. Mahaffy, D. J. McSweeney, G. S. Schorr, and A. D. Ligon. (2008). Site fidelity and association patterns in a deep-water dolphin: Rough-toothed dolphins (*Steno bredanensis*) in the Hawaiian Archipelago. *Marine Mammal Science, 24*(3), 535–553.

Baird, R. W., A. M. Gorgone, D. J. McSweeney, A. D. Ligon, M. H. Deakos, D. L. Webster, G. S. Schorr, K. K. Martien, D. R. Salden, and S. D. Mahaffy. (2009a). Population structure of island-associated dolphins: Evidence from photo-identification of common bottlenose dolphins (*Tursiops truncatus*) in the Main Hawaiian Islands. *Marine Mammal Science, 25*(2), 251–274.

Baird, R. W., D. J. McSweeney, G. S. Schorr, S. D. Mahaffy, D. L. Webster, J. Barlow, M. B. Hanson, J. P. Turner, and R. D. Andrews. (2009b). Studies of beaked whales in Hawaii: Population size, movements, trophic ecology, social organization, and behaviour. In S. J. Dolman, C. D. MacLeod, & P. G. H. Evans (Eds.), *Beaked Whale Research* (pp. 23–25). San Sebastián, Spain: European Cetacean Society.

Baird, R. W., G. Schorr, D. L. Webster, D. J. McSweeney, B. Hanson, and R. D. Andrews. (2010a). *Movements and habitat use of Cuvier's and Blainville's beaked whales in Hawaii: results from satellite tagging in 2009/2010*. La Jolla, CA.

Baird, R. W., G. S. Schorr, D. L. Webster, D. J. McSweeney, M. B. Hanson, and R. D. Andrews. (2010b). Movements and habitat use of satellite-tagged false killer whales around the main Hawaiian Islands. *Endangered Species Research, 10*, 107–121.

Baird, R. W. (2011). Short Note: Open-Ocean Movements of a Satellite-Tagged Blainville's Beaked Whale (*Mesoplodon densirostris*): Evidence for an Offshore Population in Hawai'i? *Aquatic Mammals, 37*(4), 506–511.

Baird, R. W., G. S. Schorr, D. L. Webster, S. D. Mahaffy, J. M. Aschettino, and T. Cullins. (2011a). *Movements and spatial use of satellite-tagged odontocetes in the western main Hawaiian Islands: results of field work undertaken off Oahu in October 2010 and Kauai in February 2011* (Annual progress report under Grant No. N00244-10-1-0048). Olympia, WA: Cascadia Research Collective.

Baird, R. W., G. S. Schorr, D. L. Webster, S. D. Mahaffy, D. J. McSweeney, M. B. Hanson, and R. D. Andrews. (2011b). Open-ocean movements of a satellite-tagged Blainville's beaked whale (*Mesoplodon densirostris*): Evidence for an offshore population in Hawaii? *Aquatic Mammals, 37*(4), 506–511.

Baird, R. W., G. S. Schorr, D. L. Webster, D. J. McSweeney, M. B. Hanson, and R. D. Andrews. (2011c). Movements of two satellite-tagged pygmy killer whales (*Feresa attenuata*) off the island of Hawaii. *Marine Mammal Science, 27*(4), E332–E337.

Baird, R. W., M. B. Hanson, G. S. Schorr, D. L. Webster, D. J. McSweeney, A. M. Gorgone, S. D. Mahaffy, D. M. Holzer, E. M. Oleson, and R. D. Andrews. (2012). Range and primary habitats of Hawaiian insular false killer whales: Informing determination of critical habitat. *Endangered Species Research, 18*(1), 47–61.

Baird, R. W., E. M. Oleson, J. Barlow, A. D. Ligon, A. M. Gorgone, and S. D. Mahaffy. (2013a). Evidence of an Island-Associated Population of False Killer Whales (*Pseudorca crassidens*) in the Northwestern Hawaiian Islands. *Pacific Science, 67*(4), 513–521.

Baird, R. W., J. A. Shaffer, D. L. Webster, S. D. Fisher, J. M. Aschettino, A. M. Gorgone, B. K. Rone, S. D. Mahaffy, and D. J. Moretti. (2013b). *Odontocete Studies Off the Pacific Missile Range Facility in February 2013: Satellite-Tagging, Photo Identification, and Passive Acoustic Monitoring for Species Verification*. Olympia, WA and Newport, RI: U.S. Navy Pacific Fleet.

Baird, R. W., D. L. Webster, S. D. Mahaffy, G. S. Schorr, J. M. Aschettino, and A. M. Gorgone. (2013c). *Movements and Spatial Use of Odontocetes in the western Main Hawaiian Islands: Results of a Three-year Study off Oahu and Kauai*. Olympia, WA: Cascadia Research Collective.

Baird, R. W. (2014). *Movements and Habitat Use of Dwarf and Pygmy Sperm Whales using Remotely-Deployed LIMPET Satellite Tags*. Olympia, WA: Cascadia Research Collective.

Baird, R. W., S. M. Jarvis, D. L. Webster, B. K. Rone, J. A. Shaffer, S. D. Mahaffy, A. M. Gorgone, and D. J. Moretti. (2014a). *Odontocete Studies on the Pacific Missile Range Facility in July/August 2013: Satellite-Tagging, Photo Identification, and Passive Acoustic Monitoring*. Olympia, WA and Newport, RI: U.S. Navy Pacific Fleet.

Baird, R. W., M. S. W., D. L. Webster, and B. L. Southall. (2014b). *Assessment of Modeled Received Sound Pressure Levels and Movements of Satellite-Tagged Odontocetes Exposed to Mid-Frequency Active Sonar at the Pacific Missile Range Facility: February 2011 through February 2013*.

Baird, R. W., D. Cholewiak, D. L. Webster, G. S. Schorr, S. D. Mahaffy, C. Curtice, J. Harrison, and S. M. Van Parijs. (2015a). Biologically Important Areas for Cetaceans within U.S. waters—Hawaii region. In S. M. Van Parijs, C. Curtice, & M. C. Ferguson (Eds.), *Biologically Important Areas for Cetaceans within U.S. waters* (Vol. 41, pp. 54–64). Olympia, WA: Cascadia Research Collective.

Baird, R. W., A. N. Dilley, D. L. Webster, R. Morrissey, B. K. Rone, S. M. Jarvis, S. D. Mahaffy, A. M. Gorgone, and D. J. Moretti. (2015b). *Odontocete Studies on the Pacific Missile Range Facility in February 2014: Satellite-Tagging, Photo Identification, and Passive Acoustic Monitoring*. Pearl Harbor, HI: U.S. Navy Pacific Fleet.

Baird, R. W., S. D. Mahaffy, A. M. Gorgone, T. Cullins, D. J. McSweeney, E. M. Oleson, A. L. Bradford, J. Barlow, and D. L. Webster. (2015c). False killer whales and fisheries interactions in Hawaiian waters: Evidence for sex bias and variation among populations and social groups. *Marine Mammal Science, 31*(2), 579–590.

Baird, R. W., D. L. Webster, Z. Swaim, H. J. Foley, D. B. Anderson, and A. J. Read. (2016a). *Spatial Use by Odontocetes Satellite Tagged off Cape Hatteras, North Carolina in 2015. Final report*. Virginia Beach, VA: U.S. Fleet Forces Command.

Baird, R. W., D. L. Webster, S. Watwood, R. Morrissey, B. K. Rone, S. D. Mahaffy, A. M. Gorgone, D. B. Anderson, and D. J. Moretti. (2016b). *Odontocete Studies on the Pacific Missile Range Facility in February 2015: Satellite-Tagging, Photo-Identification, and Passive Acoustic Monitoring. Final Report*. Olympia, WA: HDR Environmental Inc.

Baird, R. W., S. W. Martin, R. Manzano-Roth, D. L. Webster, and B. L. Southall. (2017). *Assessing Exposure and Response of Three Species of Odontocetes to Mid-frequency Active Sonar during Submarine Commanders Courses at the Pacific Missile Range Facility: August 2013 through February 2015. Draft Report*. Honolulu, HI: HDR, Inc.

Barlow, J., S. Rankin, E. Zele, and J. Appler. (2004). *Marine Mammal Data Collected During the Hawaiian Islands Cetacean and Ecosystem Assessment Survey (HICEAS) Conducted Aboard the NOAA Ships McArthur and David Starr Jordan, July–December 2002*. Silver Spring, MD: National Oceanic and Atmospheric Administration.

Barlow, J. (2006). Cetacean abundance in Hawaiian waters estimated from a Summer–Fall survey in 2002. *Marine Mammal Science, 22*(2), 446–464.

Barlow, J., M. C. Ferguson, W. F. Perrin, L. Ballance, T. Gerrodette, G. Joyce, C. D. MacLeod, K. Mullin, D. L. Palka, and G. Waring. (2006). Abundance and densities of beaked and bottlenose whales (family Ziphiidae). *Journal of Cetacean Research and Management, 7*(3), 263–270.

Barlow, J., S. Rankin, A. Jackson, and A. Henry. (2008). *Marine Mammal Data Collected During the Pacific Islands Cetacean and Ecosystem Assessment Survey Conducted Aboard the NOAA Ship McArthur II, July–November 2005*. Silver Springs, MD: National Oceanic and Atmospheric Administration.

Barlow, J. (2010). *Cetacean Abundance in the California Current Estimated from a 2008 Ship-Based Line-Transect Survey* (NOAA Technical Memorandum NMFS-SWFSC-456). La Jolla, CA: Southwest Fisheries Science Center.

Barlow, J., J. Calambokidis, E. A. Falcone, C. S. Baker, A. M. Burdin, P. J. Clapham, J. K. B. Ford, C. M. Gabriele, R. LeDuc, D. K. Mattila, T. J. Quinn, II, L. Rojas-Bracho, J. M. Straley, B. L. Taylor, J. Urbán R, P. Wade, D. Weller, B. H. Witteveen, and M. Yamaguchi. (2011). Humpback whale abundance in the North Pacific estimated by photographic capture-recapture with bias correction from simulation studies. *Marine Mammal Science, 27*(4), 793–818.

Barlow, J. (2016). *Cetacean Abundance in the California Current Estimated from Ship-based Line-transect Surveys in 1991–2014.* (NOAA Administrative Report NMFS-SWFSC-LJ-1601). La Jolla, CA: Southwest Fisheries Science Center.

Baumann-Pickering, S., L. K. Baldwin, A. E. Simonis, M. A. Roche, M. L. Melcon, J. A. Hildebrand, E. M. Oleson, R. W. Baird, G. S. Schorr, D. L. Webster, and D. J. McSweeney. (2010). *Characterization of Marine Mammal Recordings from the Hawaii Range Complex*. Monterey, CA: Naval Postgraduate School.

Baumann-Pickering, S., M. A. Roch, R. L. Brownell, Jr., A. E. Simonis, M. A. McDonald, A. Solsona-Berga, E. M. Oleson, S. M. Wiggins, and J. A. Hildebrand. (2014). Spatio-temporal patterns of beaked whale echolocation signals in the north Pacific. *PLoS ONE, 9*(1), e86072.

Baumann-Pickering, S., J. A. Hildebrand, and T. Yack. (2015a). *Modeling of Habitat and Foraging Behavior of Beaked Whales in the Southern California Bight*.

Baumann-Pickering, S., J. S. Trickey, M. A. Roch, and S. M. Wiggins. (2015b). *Relative Densities and Spatial Distribution of Beaked Whales in Southern California*. La Jolla, CA: Scripps Institution of Oceanography – University of California San Diego and San Diego State University.

Baumann-Pickering, S., A. Širović, J. A. Hildebrand, J. S. Trickey, A. Meyer-Löbbecke, S. M. Wiggins, M. A. Roch, and M. A. McDonald. (2016a). *Progress Report on the Application of Passive Acoustic Monitoring Data for Assessing the Potential Impact of Mid-Frequency Active Sonar on Whales* (MPL Technical Memorandum #605). Honolulu, HI: Scripps Institute of Oceanography.

Baumann-Pickering, S., J. S. Trickey, S. M. Wiggins, and E. M. Oleson. (2016b). Odontocete occurrence in relation to changes in oceanography at a remote equatorial Pacific seamount. *Marine Mammal Science, 32*(3), 805–825.

Becker, E. A., K. A. Forney, D. G. Foley, and J. Barlow. (2012). *Density and Spatial Distribution Patterns of Cetaceans in the Central North Pacific based on Habitat Models* (NOAA Technical Memorandum NMFS-SWFSC-490). La Jolla, CA: Southwest Fisheries Science Center.

Becker, E. A., K. A. Forney, P. C. Fiedler, J. Barlow, S. J. Chivers, C. A. Edwards, A. M. Moore, and J. V. Redfern. (2016). Moving Towards Dynamic Ocean Management: How Well Do Modeled Ocean Products Predict Species Distributions? *Remote Sensing, 8*(2), 149.

Berman-Kowalewski, M., F. M. D. Gulland, S. Wilkin, J. Calambokidis, B. Mate, J. Cordaro, D. Rotstein, J. S. Leger, P. Collins, K. Fahy, and S. Dover. (2010). Association Between Blue Whale (*Balaenoptera musculus*) Mortality and Ship Strikes Along the California Coast. *Aquatic Mammals, 36*(1), 59–66.

Bettridge, S., C. S. Baker, J. Barlow, P. J. Clapham, M. Ford, D. Gouveia, D. K. Mattila, R. M. Pace, III, P. E. Rosel, G. K. Silber, and P. R. Wade. (2015). *Status Review of the Humpback Whale (Megaptera novaeangliae) under the Endangered Species Act* (NOAA Technical Memorandum NMFS-SWFSC-540). La Jolla, CA: Southwest Fisheries Science Center.

Bonnell, M. L., and M. D. Dailey. (1993). Marine Mammals. In M. D. Dailey, D. J. Reish, & J. W. Anderson (Eds.), *Ecology of the Southern California Bight: A Synthesis and Interpretation* (pp. 604–682). Los Angeles, CA: University of California Press.

Bradford, A. L., K. A. Forney, E. A. Oleson, and J. Barlow. (2013). *Line-transect abundance estimates of cetaceans in the Hawaiian EEZ* (PIFSC Working Paper WP-13-004, PSRG-2013-18). Honolulu, HI: Pacific Islands Fisheries Science Center.

Bradford, A. L., and E. Lyman. (2015). *Injury Determinations for Humpback Whales and Other Cetaceans Reported to NOAA Response Networks in the Hawaiian Islands During 2007–2012* (NOAA Technical Memorandum NMFS- PIFSC-45). Honolulu, HI: Pacific Islands Fisheries Science Center.

Bradford, A. L., and K. A. Forney. (2016). *Injury Determinations for Marine Mammals Observed Interacting with Hawaii and American Samoa Longline Fisheries During 2009–2013* (NOAA Technical Memorandum NMFS-PIFSC-50). Honolulu, HI: Pacific Islands Fisheries Science Center.

Bradford, A. L., K. A. Forney, E. M. Oleson, and J. Barlow. (2017). Abundance estimates of cetaceans from a line-transect survey within the U.S. Hawaiian Islands Exclusive Economic Zone. *Fishery Bulletin, 115*(2), 129–142.

Calambokidis, J., E. A. Falcone, T. J. Quinn, A. M. Burdin, P. J. Clapham, J. K. B. Ford, C. M. Gabriele, R. LeDuc, D. Mattila, L. Rojas-Bracho, J. M. Straley, B. L. Taylor, J. Urbán R., D. Weller, B. H. Witteveen, M. Yamaguchi, A. Bendlin, D. Camacho, K. Flynn, A. Havron, J. Huggins, and N. Maloney. (2008). *SPLASH: Structure of Populations, Levels of Abundance and Status of Humpback Whales in the North Pacific*. Olympia, WA: Cascadia Research.

Calambokidis, J., J. Barlow, J. K. B. Ford, T. E. Chandler, and A. B. Douglas. (2009a). Insights into the population structure of blue whales in the Eastern North Pacific from recent sightings and photographic identification. *Marine Mammal Science, 25*(4), 816–832.

Calambokidis, J., E. Falcone, A. Douglas, L. Schlender, and J. Huggins. (2009b). *Photographic Identification of Humpback and Blue Whales off the U.S. West Coast: Results and Updated Abundance Estimates from 2008 Field Season*. La Jolla, CA: U.S. Department of Commerce.

Calambokidis, J., E. M. Oleson, M. F. McKenna, and J. A. Hildebrand. (2009c). *Blue whale behavior in shipping lanes and response to ships.* Paper presented at the 2009 Office of Naval Research Marine Mammal Program Review, Alexandria, VA.

Calambokidis, J. (2012). *Summary of Ship-Strike Related Research on Blue Whales in 2011*. Olympia, WA: Cascadia Research.

Calambokidis, J., and J. Barlow. (2013). *Updated Abundance Estimates of Blue and Humpback Whales off the U.S. West Coast Incorporating Photo-Identifications from 2010 and 2011* (PSRG-2013-13R). Olympia, WA and La Jolla, CA: Cascadia Research and Southwest Fisheries Science Center.

Calambokidis, J., G. H. Steiger, C. Curtice, J. Harrison, M. C. Ferguson, E. Becker, M. DeAngelis, and S. M. Van Parijs. (2015). Biologically Important Areas for Selected Cetaceans Within U.S. Waters – West Coast Region. *Aquatic Mammals (Special Issue), 41*(1), 39–53.

Campbell, G. S., L. Thomas, K. Whitaker, A. B. Douglas, J. Calambokidis, and J. A. Hildebrand. (2015). Inter-annual and seasonal trends in cetacean distribution, density and abundance off southern California. *Deep Sea Research Part II: Topical Studies in Oceanography, 112*, 143–157.

Carretta, J. V., M. S. Lowry, C. E. Stinchcomb, M. S. Lynn, and R. E. Cosgrove. (2000). *Distribution and abundance of marine mammals at San Clemente Island and surrounding offshore waters: Results from aerial and ground surveys in 1998 and 1999*. La Jolla, CA: U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service, Southwest Fisheries Science Center.

Carretta, J. V., K. A. Forney, E. Oleson, K. Martien, M. M. Muto, M. S. Lowry, J. Barlow, J. Baker, B. Hanson, D. Lynch, L. Carswell, R. L. Brownell, J. Robbins, D. K. Mattila, K. Ralls, and M. C. Hill. (2011). *U.S. Pacific Marine Mammal Stock Assessments: 2010* (NOAA Technical Memorandum NMFS-SWFSC-476). La Jolla, CA: Southwest Fisheries Science Center.

Carretta, J. V., E. Oleson, D. W. Weller, A. R. Lang, K. A. Forney, J. Baker, B. Hanson, K. Martien, M. M. Muto, A. J. Orr, H. Huber, M. S. Lowry, J. Barlow, D. Lynch, L. Carswell, R. L. B. Jr., and D. K. Mattila. (2014). *U.S. Pacific Marine Mammal Stock Assessments: 2013* (NOAA Technical Memorandum NMFS-SWFSC-532). La Jolla, CA: U.S. Department of Commerce, NOAA Technical Memorandum.

Carretta, J. V., E. Oleson, D. W. Weller, A. R. Lang, K. A. Forney, J. Baker, M. M. Muto, B. Hanson, A. J. Orr, H. Huber, M. S. Lowry, J. Barlow, J. Moore, D. Lynch, L. Carswell, and R. L. Brownell. (2015). *U.S. Pacific Marine Mammal Stock Assessments: 2014* (NOAA Technical Memorandum NMFS-SWFSC-549). La Jolla, CA: Southwest Fisheries Science Center.

Carretta, J. V., M. M. Muto, S. Wilkin, J. Greenman, K. Wilkinson, M. DeAngelis, J. Viezbicke, D. Lawson, and J. Jannot. (2016a). *Sources of Human-Related Injury and Mortality for U.S. Pacific West Coast Marine Mammal Stock Assessments, 2010–2014* (NOAA-TM-NMFS-SWFSC-554). La Jolla, CA: Southwest Fisheries Science Center.

Carretta, J. V., E. M. Oleson, J. Baker, D. W. Weller, A. R. Lang, K. A. Forney, M. M. Muto, B. Hanson, A. J. Orr, H. Huber, M. S. Lowry, J. Barlow, J. E. Moore, D. Lynch, L. Carswell, and R. L. Brownell Jr. (2016b). *U.S. Pacific Marine Mammal Stock Assessments: 2015* (NOAA Technical Memorandum NMFS-SWFSC-561). Silver Spring, MD: U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service.

Carretta, J. V., E. M. Oleson, J. Baker, D. W. Weller, A. R. Lang, K. A. Forney, M. M. Muto, B. Hanson, A. J. Orr, H. Huber, M. S. Lowry, J. Barlow, J. E. Moore, D. Lynch, L. Carswell, and R. L. Brownell, Jr. (2017). *U.S. Pacific Marine Mammal Stock Assessments: 2016* (NOAA Technical Memorandum NMFS-SWFSC-561). La Jolla, CA: Southwest Fisheries Science Center.

Clark, C. W., and K. M. Fristrup. (2001). Baleen whale responses to low-frequency human-made underwater sounds. *The Journal of the Acoustical Society of America, 110*(5), 2751.

Courbis, S., R. W. Baird , F. Cipriano, and D. Duffield. (2014). Multiple Populations of Pantropical Spotted Dolphins in Hawaiian Waters. *Journal of Heredity, 105*(5), 627–641.

Cox, T. M., T. J. Ragen, A. J. Read, E. Vox, R. W. Baird, K. Balcomb, J. Barlow, J. Caldwell, T. Cranford, L. Crum, A. D'Amico, G. D'Spain, A. Fernandez, J. Finneran, R. Gentry, W. Gerth, F. Gulland, J. Hildebrand, D. Houser, T. Hullar, P. D. Jepson, D. Ketten, C. D. MacLeod, P. Miller, S. Moore, D. C. Mountain, D. Palka, P. Ponganis, S. Rommel, T. Rowles, B. Taylor, P. Tyack, D. Wartzok, R. Gisiner, J. Mead, and L. Benner. (2006). Understanding the impacts of anthropogenic sound on beaked whales. *Journal of Cetacean Research and Management, 7*(3), 177–187.

Croll, D. A., C. W. Clark, J. Calambokidis, W. T. Ellison, and B. R. Tershy. (2001). Effect of anthropogenic low-frequency noise on the foraging ecology of *Balaenoptera* whales. *Animal Conservation, 4*, 13–27.

Dalebout, M. L., J. G. Mead, C. S. Baker, A. N. Baker, and A. L. van Helden. (2002). A new species of beaked whale *Mesoplodon perrini* sp. n. (Cetacea: Ziphiidae) discovered through phylogenetic analyses of mitochondrial DNA sequences. *Marine Mammal Science, 18*(3), 577–608.

Davis, R. W., G. S. Fargion, N. May, T. D. Leming, M. Baumgartner, W. E. Evans, L. J. Hansen, and K. Mullin. (1998). Physical habitat of cetaceans along the continental slope in the north-central and western Gulf of Mexico. *Marine Mammal Science, 14*(3), 490–507.

De Jesus, M., G. Heckel, J. M. Breiwick, and S. B. Reilly. (2014). Migration timing and distance from shore of southbound eastern Pacific gray whales (*Eschrichtius robustus*) off Ensenada, Baja California, Mexico. *Marine Mammal Science, 30*(2), 674–690.

Deakos, M. H., and M. F. Richlen. (2015). *Vessel-Based Marine Mammal Survey on the Navy Range off Kauai in Support of Passive Acoustic Monitoring and Satellite-Tagging Efforts: 1–9 February 2014*. Honolulu, HI: HDR Inc.

Debich, A. J., S. Baumann-Pickering, A. Širović, J. A. Hildebrand, A. L. Alldredge, R. S. Gottlieb, S. Herbert, S. C. Johnson, L. K. Roche, B. Thayre, J. S. Trickey, and S. M. Wiggins. (2014). *Passive Acoustic Monitoring for Marine Mammals in the Northwest Training Range Complex 2012–2013*. La Jolla, CA: Marine Physical Laboratory, Scripps Institution of Oceanography, University of California San Diego.

Debich, A. J., S. Baumann-Pickering, A. Širović, J. A. Hildebrand, A. L. Alldredge, R. S. Gottlieb, S. T. Herbert, S. C. Johnson, A. C. Rice, L. K. Roche, B. J. Thayre, J. S. Trickey, L. M. Varga, and S. M. Wiggins. (2015a). *Passive Acoustic Monitoring for Marine Mammals in the SOCAL Naval Training Area Dec 2012–Jan 2014* (MPL Technical Memorandum #552). La Jolla, CA: Marine Physical Laboratory, Scripps Institution of Oceanography.

Debich, A. J., S. Baumann-Pickering, A. Širović, J. A. Hildebrand, S. T. Herbert, S. C. Johnson, A. C. Rice, J. S. Trickey, and S. M. Wiggins. (2015b). *Passive Acoustic Monitoring for Marine Mammals in the SOCAL Range Complex January–July 2014* (MPL Technical Memorandum #554). La Jolla, CA: Marine Physical Laboratory, Scripps Institution of Oceanography, University of California San Diego.

DeRuiter, S. L., I. L. Boyd, D. E. Claridge, C. W. Clark, C. Gagon, B. L. Southall, and P. L. Tyack. (2013a). Delphinid whistle production and call matching during playback of simulated military sonar. *Marine Mammal Science, 29*(2), E46–59.

DeRuiter, S. L., B. L. Southall, J. Calambokidis, W. M. Zimmer, D. Sadykova, E. A. Falcone, A. S. Friedlaender, J. E. Joseph, D. Moretti, G. S. Schorr, L. Thomas, and P. L. Tyack. (2013b). First

direct measurements of behavioural responses by Cuvier's beaked whales to mid-frequency active sonar. *Biology Letters, 9*(4), 20130223.

DiMarzio, N., B. Jones, D. Moretti, L. Thomas, and C. Oedekoven. (2018). *M3R Monitoring on the Southern California Offshore Range (SCORE) and the Pacific Missile Range Facility (PMRF)*. Newport, RI: Naval Undersea Warfare Center.

Douglas, A. B., J. Calambokidis, L. M. Munger, M. S. Soldevilla, M. C. Ferguson, A. M. Havron, D. L. Camacho, G. S. Campbell, and J. A. Hildebrand. (2014). Seasonal distribution and abundance of cetaceans off Southern California estimated from CalCOFI cruise data from 2004 to 2008. *Fishery Bulletin, 112*(2–3), 198–220.

Dunlop, R. A., D. H. Cato, and M. J. Noad. (2010). Your attention please: Increasing ambient noise levels elicits a change in communication behaviour in humpback whales (*Megoptera novaeangliae*). *Proceedings of the Royal Society B: Biological Sciences, 277*, 2521–2529.

Dunlop, R. A. (2016). The effect of vessel noise on humpback whale, *Megaptera novaeangliae*, communication behaviour. *Animal Behaviour, 111*, 13–21.

Dyndo, M., D. M. Wisniewska, L. Rojano-Donate, and P. T. Madsen. (2015). Harbour porpoises react to low levels of high frequency vessel noise. *Scientific Reports, 5*, 11083.

Erbe, C., R. Williams, D. Sandilands, and E. Ashe. (2014). Identifying modeled ship noise hotspots for marine mammals of Canada's Pacific region. *PLoS ONE, 9*(3), e89820.

Falcone, E. A., G. S. Schorr, A. B. Douglas, J. Calambokidis, E. Henderson, M. F. McKenna, J. Hildebrand, and D. Moretti. (2009). Sighting characteristics and photo-identification of Cuvier's beaked whales (*Ziphius cavirostris*) near San Clemente Island, California: A key area for beaked whales and the military? *Marine Biology, 156*, 2631–2640.

Falcone, E. A., B. Diehl, A. Douglas, and J. Calambokidis. (2011). *Photo-Identification of Fin Whales (Balaeanoptera physalus) along the US West Coast, Baja California, and Canada*. Olympia, WA: Cascadia Research Collective.

Falcone, E. A., and G. S. Schorr. (2011). *Distribution and Demographics of Marine Mammals in SOCAL Through Photo-Identification, Genetics, and Satellite Telemetry: A Summary of Surveys Conducted 15 July 2010 – 24 June 2011*. Monterey, CA: U.S. Navy Postgraduate School.

Falcone, E. A., and G. S. Schorr. (2012). *Distribution and Demographics of Marine Mammals in SOCAL Through Photo-Identification, Genetics, and Satellite Telemetry: A Summary of Surveys Conducted 1 July 2011 – 15 June 2012*. Monterey, CA: Naval Postgraduate School.

Falcone, E. A., and G. S. Schorr. (2013). *Distribution and Demographics of Marine Mammals in SOCAL Through Photo-Identification, Genetics, and Satellite Telemetry: A Summary of Surveys Conducted 1 July 2012 – 30 June 2013*. Monterey, CA: U.S. Navy Postgraduate School.

Falcone, E. A., and G. S. Schorr. (2014a). *Distribution and Demographics of Marine Mammals in SOCAL through Photo-Identification, Genetics, and Satellite Telemetry* (Prepared for Chief of Naval Operations Energy and Environmental Readiness Division: NPS-OC-14-005CR). Monterey, CA: Naval Postgraduate School.

Falcone, E. A., and G. S. Schorr. (2014b). *Distribution and Demographics of Marine Mammals in SOCAL through Photo-Identification, Genetics, and Satellite Telemetry: A Summary of Surveys Conducted 1 July 2012 – 30 June 2013*. Olympia, WA: Cascadia Research Collective.

Falcone, E. A., G. S. Schorr, S. L. Watwood, S. L. DeRuiter, A. N. Zerbini, R. D. Andrews, R. P. Morrissey, and D. J. Moretti. (2017). Diving behaviour of Cuvier's beaked whales exposed to two types of military sonar. *Royal Society Open Science, 4*(170629), 1–21.

Farak, A. M., M. W. Richie, J. A. Rivers, and R. K. Uyeyama. (2011). *Cruise Report, Marine Species Monitoring and Lookout Effectiveness Study Submarine Commanders Course 11-1 and Undersea Warfare Exercise February 2011, Hawaii Range Complex*. Washington, DC: Commander, U.S. Pacific Fleet.

Ferguson, M. C., C. Curtice, and J. Harrison. (2015a). Biologically important areas for cetaceans within U.S. waters – Gulf of Alaska region. *Aquatic Mammals (Special Issue), 41*(1), 65–78.

Ferguson, M. C., C. Curtice, J. Harrison, and S. M. Van Parijs. (2015b). Biologically important areas for cetaceans within U.S. waters – Overview and rationale. *Aquatic Mammals (Special Issue), 41*(1), 2–16.

Forestell, P. H., and J. Urban R. (2007). Movement of a humpback whale (*Megaptera novaeangliaeI*) between the Revillagigedo and Hawaiian Archipelagos within a winter breeding season. *Latin American Journal of Aquatic Mammals, 6*(1), 97–102.

Forney, K. A., E. A. Becker, D. G. Foley, J. Barlow, and E. M. Oleson. (2015). Habitat-based models of cetacean density and distribution in the central North Pacific. *Endangered Species Research, 27*, 1–20.

Frankel, A. S., and C. W. Clark. (2000). Behavioral responses of humpback whales (*Megaptera novaeangliae*) to full-scale ATOC signals. *The Journal of the Acoustical Society of America, 108*(4), 1930–1937.

Frantzis, A., J. C. Goold, E. K. Skarsoulis, M. I. Taroudakis, and V. Kandia. (2002). Clicks from Cuvier's beaked whales, *Ziphius cavirostris* (L). *The Journal of the Acoustical Society of America, 112*(1), 34.

Frisk, G. V. (2012). Noiseonomics: The relationship between ambient noise levels in the sea and global economic trends. *Scientific Reports, 2*(437).

Fristrup, K. M., L. T. Hatch, and C. W. Clark. (2003). Variation in humpback whale (*Megaptera novaeangliae*) song length in relation to low-frequency sound broadcasts. *The Journal of the Acoustical Society of America, 113*(6), 3411–3424.

Gannier, A., and K. L. West. (2005). Distribution of the rough-toothed dolphin (*Steno bredanensis*) around the Windward Islands (French Polynesia). *Pacific Science, 59*, 17–24.

Gassmann, M., S. M. Wiggins, and J. A. Hildebrand. (2015). Three-dimensional tracking of Cuvier's beaked whales' echolocation sounds using nested hydrophone arrays. *The Journal of the Acoustical Society of America, 138*(4), 2483–2494.

Gedamke, J., M. Ferguson, J. Harrison, L. Hatch, L. Henderson, M. B. Porter, B. L. Southall, and S. Van Parijs. (2016). Predicting Anthropogenic Noise Contributions to U.S. Waters. *Advances in Experimental Medicine and Biology, 875*, 341–347.

Goldbogen, J. A., A. S. Friedlaender, J. Calambokidis, M. F. McKenna, M. Simon, and D. Nowacek. (2013a). Integrative Approaches to the Study of Baleen Whale Diving Behavior, Feeding Performance, and Foraging Ecology. *BioScience, 63*(2), 90–100.

Goldbogen, J. A., B. L. Southall, S. L. DeRuiter, J. Calambokidis, A. S. Friedlaender, E. L. Hazen, E. A. Falcone, G. S. Schorr, A. Douglas, D. J. Moretti, C. Kyburg, M. F. McKenna, and P. L. Tyack.

(2013b). Blue whales respond to simulated mid-frequency military sonar. *Proceedings of the Royal Society B: Biological Sciences, 280*(1765), 20130657.

Goldbogen, J. A., A. K. Stimpert, S. L. DeRuiter, J. Calambokidis, A. S. Friedlaender, G. S. Schorr, D. J. Moretti, P. L. Tyack, and B. L. Southall. (2014). Using accelerometers to determine the calling behavior of tagged baleen whales. *The Journal of Experimental Biology, 217*(Pt 14), 2449–2455.

Gordon, J., D. Gillespie, J. Potter, A. Frantzis, M. P. Simmonds, R. Swift, and D. Thompson. (2003). A review of the effects of seismic surveys on marine mammals. *Marine Technology Society Journal, 37*(4), 16–34.

Graham, S. E., and B. Saunders. (2015). *Occurrence, Distribution, and Population Estimates of Marine Mammals near Silver Strand Training Complex and San Diego Bay, CA* (Prepared for Commander, Pacific Fleet. Submitted to Naval Facilities Engineering Command [NAVFAC] Southwest, California, February 2015). San Diego, CA: Space and Naval Warfare Systems Command Center Pacific.

Griffiths, E. T., and J. Barlow. (2016). Cetacean acoustic detections from free-floating vertical hydrophone arrays in the southern California Current. *The Journal of the Acoustical Society of America Express Letters, 140*(5), EL399.

Hamilton, T. A., J. V. Redfern, J. Barlow, L. T. Ballance, T. Gerrodette, R. S. Holt, K. A. Forney, and B. L. Taylor. (2009). *Atlas of Cetacean Sightings for Southwest Fisheries Science Center Cetacean and Ecosystem Surveys: 1986–2005* (National Oceanic and Atmospheric Administration Technical Memorandum NMFS-SWFSC-440). La Jolla, CA: Southwest Fisheries Science Center.

Hann, C. H., T. D. Smith, and L. G. Torres. (2016). A sperm whale's perspective: The importance of seasonality and seamount depth. *Marine Mammal Science, 32*(4), 1470–1481.

Harris, C., and L. Thomas. (2015). *Status and Future of Research on the Behavioral Responses of Marine Mammals to U.S. Navy Sonar* (Centre for Research into Ecological & Environmental Modelling Technical Report 2015-3). St. Andrews, United Kingdom: University of St. Andrews.

Harris, C. M., D. Sadykova, S. L. DeRuiter, P. L. Tyack, P. J. O. Miller, P. H. Kvadsheim, F. P. A. Lam, and L. Thomas. (2015). Dose response severity functions for acoustic disturbance in cetaceans using recurrent event survival analysis. *Ecosphere, 6*(11), art236.

Harris, C. M., L. Thomas, E. A. Falcone, J. Hildebrand, D. Houser, P. H. Kvadsheim, F.-P. A. Lam, P. J. O. Miller, D. J. Moretti, A. J. Read, H. Slabbekoorn, B. L. Southall, P. L. Tyack, D. Wartzok, V. M. Janik, and J. Blanchard. (2018). Marine mammals and sonar: Dose-response studies, the risk-disturbance hypothesis and the role of exposure context. *Journal of Applied Ecology, 55*(1), 396–404.

Hartel, E. F., R. Constantine, and L. G. Torres. (2015). Changes in habitat use patterns by bottlenose dolphins over a 10-year period render static management boundaries ineffective. *Aquatic Conservation: Marine and Freshwater Ecosystems, 25*(5), 701–711.

HDR. (2010). *RIMPAC 2010 Marine Species Monitoring*. Pearl Harbor, HI: U.S. Navy Pacific Fleet.

HDR. (2011). *Koa Kai-11 Marine Species Monitoring Surveys* (Vessel-and Aerial-based monitoring surveys). Honolulu, HI: U.S. Navy Marine Species Monitoring Program.

Heenehan, H. L., D. W. Johnston, S. M. Van Parijs, L. Bejder, and J. A. Tyne. (2016a). *Acoustic response of Hawaiian spinner dolphins to human disturbances.* Paper presented at the Meetings on Acoustics. Dublin, Ireland.

Heenehan, H. L., J. A. Tyne, L. Bejder, S. M. Van Parijs, and D. W. Johnston. (2016b). Passive acoustic monitoring of coastally associated Hawaiian spinner dolphins, *Stenella longirostris*, ground-truthed through visual surveys. *The Journal of the Acoustical Society of America, 140*(1), 206.

Heenehan, H. L., S. M. Van Parijs, L. Bejder, J. A. Tyne, and D. W. Johnston. (2017a). Using acoustics to prioritize management decisions to protect coastal dolphins: A case study using Hawaiian spinner dolphins. *Marine Policy, 75*, 84–90.

Heenehan, H. L., S. M. Van Parijs, L. Bejder, J. A. Tyne, B. L. Southall, H. Southall, and D. W. Johnston. (2017b). Natural and anthropogenic events influence the soundscapes of four bays on Hawaii Island. *Marine Pollution Bulletin, 124*(1), 9–20.

Henderson, E. E., R. Manzano-Roth, S. W. Martin, and B. Matsuyama. (2015a). *Behavioral Responses of Beaked Whales to Mid-Frequency Active Sonar on the Pacific Missile Range Facility, Hawaii*. Paper presented at the Society for Marine Mammalogy 20th Biennial Conference. Dunedin, New Zealand.

Henderson, E. E., R. A. Manzano-Roth, S. W. Martin, and B. Matsuyama. (2015b). *Impacts of U.S. Navy Training Events on Beaked Whale Foraging Dives in Hawaiian Waters: Update*. San Diego, CA: Space and Naval Warfare Systems Command Systems Center Pacific.

Henderson, E. E., S. W. Martin, R. Manzano-Roth, and B. M. Matsuyama. (2016). Occurrence and habitat use of foraging Blainville's beaked whales (*Mesoplodon densirostris*) on a U.S. Navy range in Hawai'i. *Aquatic Mammals, 42*(4), 549–562.

Hermannsen, L., K. Beedholm, J. Tougaard, and P. T. Madsen. (2014). High frequency components of ship noise in shallow water with a discussion of implications for harbor porpoises (*Phocoena phocoena*). *The Journal of the Acoustical Society of America, 136*(4), 1640–1653.

Hildebrand, J., H. Bassett, S. Baumann, G. Campbell, A. Cummins, S. Kerosky, M. Melcon, K. Merkens, L. Munger, M. A. Roch, L. Roche, A. Simonis, and S. Wiggins. (2011). *High Frequency Acoustic Recording Package Data Summary Report January 31, 2010 - March 26, 2010 SOCAL 37, Site N,* (Scripps Whale Acoustics). La Jolla, CA: Scripps Marine Physical Laboratory.

Hildebrand, J. A., S. Baumann-Pickering, and M. A. McDonald. (2009). *Beaked Whale Presence, Habitat, and Sound Production in the North Pacific* (Approved for public release; distribution unlimited). La Jolla, CA: University of California San Diego, Scripps Institution of Oceanography.

Hill, M., E. Oleson, and K. Andrews. (2010). *New Island-Associated stocks for Hawaiian Spinner Dolphins (Stenella longirostris longirostris): Rationale and New Stock Boundaries*. Honolulu, HI: National Oceanic and Atmospheric Administration's Pacific Islands Fisheries Science Center.

Irvine, L. M., B. R. Mate, M. H. Winsor, D. M. Palacios, S. J. Bograd, D. P. Costa, and H. Bailey. (2014). Spatial and temporal occurrence of blue whales off the U.S. west coast, with implications for management. *PLoS ONE, 9*(7), e102959.

Jefferson, T. A., M. A. Webber, and R. L. Pitman. (2008). *Marine Mammals of the World: A Comprehensive Guide to Their Identification*. London, United Kingdom: Elsevier.

Jefferson, T. A., M. A. Smultea, and C. E. Bacon. (2014). Southern California Bight marine mammal density and abundance from aerial survey, 2008–2013. *Journal of Marine Animals and Their Ecology, 7*(2), 14–30.

Jefferson, T. A., M. A. Webber, and R. L. Pitman. (2015). *Marine Mammals of the World: A Comprehensive Guide to Their Identification* (2nd ed.). Cambridge, MA: Academic Press.

Jensen, A. S., and G. K. Silber. (2004). *Large Whale Ship Strike Database* (NOAA Technical Memorandum NMFS-OPR-25). Silver Springs, MD: National Marine Fisheries Service, Office of Protected Resources.

Johnston, D. W., M. E. Chapla, L. E. Williams, and D. K. Matthila. (2007). Identification of humpback whale Megaptera novaeangliae wintering habitat in the Northwestern Hawaiian Islands using spatial habitat modeling. *Endangered Species Research, 3*, 249–257.

Kennett, J. P. (1982). *Marine Geology*. New York, NY: Prentice-Hall.

Ketten, D. R., J. Lien, and S. Todd. (1993). Blast injury in humpback whale ears: Evidence and implications. *The Journal of the Acoustical Society of America, 94*(3), 1849–1850.

Ketten, D. R. (1998). *Marine Mammal Auditory Systems: A Summary of Audiometric and Anatomical Data and Its Implications for Underwater Acoustic Impacts*. La Jolla, CA: U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service, Southwest Fisheries Science Center.

Kim, S.-S., and P. Wessel. (2011). New global seamount census from altimetry-derived gravity data. *Geophysical Journal International, 186*(2), 615–631.

Klinck, H., S. L. Nieukirk, S. Fregosi, D. K. Mellinger, S. Lastuka, G. B. Shilling, and J. C. Luby. (2015). *Cetacean Studies on the Hawaii Range Complex in December 2014–January 2015: Passive Acoustic Monitoring of Marine Mammals using Gliders. Final Report* (Prepared for Naval Facilities Engineering Command Pacific under HDR Environmental, Operations and Construction, Inc.). Honolulu, HI: HDR Inc.

Klinck, H., and S. L. Nieukirk (2016). [Personal Communication: Question about humpbacks in glider data].

Klinck, H., S. L. Nieukirk, S. Fregosi, K. Klinck, D. K. Mellinger, S. Lastuka, G. B. Shilling, and J. C. Luby. (2016). *Cetacean Studies on the Kona Coast in March 2010: Passive Acoustic Monitoring of Marine Mammals Using Gliders–Results from an Engineering Test. Final Report* (Prepared for Naval Facilities Engineering Command Pacific under HDR Environmental, Operations and Construction, Inc.). Honolulu, HI: HDR Inc.

Kvile, K. O., G. H. Taranto, T. J. Pitcher, and T. Morato. (2014). A global assessment of seamount ecosystems knowledge using an ecosystem evaluation framework. *Biological Conservation, 173*, 108–120.

Laggner, D. (2009). *Blue whale (Baleanoptera musculus) ship strike threat assessment in the Santa Barbara Channel, California.* (Unpublished master's thesis). The Evergreen State College, Olympia, WA. Retrieved from http://archives.evergreen.edu.

Laist, D. W., A. R. Knowlton, J. G. Mead, A. S. Collet, and M. Podesta. (2001). Collisions between ships and whales. *Marine Mammal Science, 17*(1), 35–75.

Lammers, M. O., A. A. Pack, and L. Davis. (2003). *Historical evidence of whale/vessel collisions in Hawaiian waters (1975–Present)*. Honolulu, HI: National Oceanic and Atmospheric AdministrationOcean Science Institute.

Lammers, M. O., P. I. Fisher-Pool, W. W. L. Au, C. G. Meyer, K. B. Wong, and R. E. Brainard. (2011). Humpback whale, *Megaptera novaeangliae,* song reveals wintering activity in the Northwestern Hawaiian Islands. *Marine Ecology Progress Series, 423*, 261–268.

Lammers, M. O., A. A. Pack, E. G. Lyman, and L. Espiritu. (2013). Trends in collisions between vessels and North Pacific humpback whales (*Megaptera novaeangliae*) in Hawaiian waters (1975–2011). *Journal of Cetacean Resource Management, 13*(1), 73–80.

Lammers, M. O., M. Howe, L. M. Munger, and E. Nosal. (2015a). *Acoustic Monitoring of Dolphin Occurrence and Activity in the Virginia Capes MINEX W-50 Range 2012–2014: Preliminary Results. Final Report* (Prepared for U.S. Fleet Forces Command. Submitted to Naval Facilities Engineering Command Atlantic, Norfolk, VA, under Contract No. N62470-10-3011, Task Orders 03 and 43, issued to HDR Inc). Virginia Beach, VA: Naval Facilities Engineering Command Atlantic.

Lammers, M. O., L. M. Munger, J. N. Oswald, and T. M. Yack. (2015b). *Passive Acoustic Monitoring of Cetaceans in the Hawaii Range Complex Using Ecological Acoustic Recorders (EARs).* (Prepared for Commander, Pacific Fleet. Submitted to Naval Facilities Engineering Command Pacific Pearl Harbor, HI, under Contract No. N62470-10-D-3011, Task Orders KB14 and KB22, issued to HDR Inc.). Honolulu, HI: Oceanwide Science Institute.

Lewis, L. A., and A. Širović. (2018). Variability in blue whale acoustic behavior off southern California. *Marine Mammal Science, 34*(2), 311–329.

Li, S., H. Wu, Y. Xu, C. Peng, L. Fang, M. Lin, L. Xing, and P. Zhang. (2015). Mid- to high-frequency noise from high-speed boats and its potential impacts on humpback dolphins. *The Journal of the Acoustical Society of America, 138*(2), 942–952.

Lodi, L., and B. Hetzel. (1999). Rough-toothed dolphin, *Steno bredanensis*, feeding behaviors in Ilha Grande Bay, Brazil. *Biociências, 7*(1), 29–42.

MacLeod, C., W. F. Perrin, R. Pitman, J. Barlow, L. Ballance, A. D'Amico, T. Gerrodette, G. Joyce, K. D. Mullin, D. L. Palka, and G. T. Waring. (2006). Known and inferred distributions of beaked whale species (family Ziphiidae; Order Cetacea). *Journal of Cetacean Research and Management, 7*(3), 271–286.

MacLeod, C. D., and A. D'Amico. (2006). A review of beaked whale behaviour and ecology in relation to assessing and mitigating impacts of anthropogenic noise. *Journal of Cetacean Research and Management, 7*(3), 211–222.

MacLeod, C. D., and G. Mitchell. (2006). Key areas for beaked whales worldwide. *Journal of Cetacean Research and Management, 7*(3), 309–322.

Mahaffy, S. D., R. W. Baird, D. J. McSweeney, D. L. Webster, and G. S. Schorr. (2015a). High site fidelity, strong associations, and long-term bonds: Short-finned pilot whales off the island of Hawai'i. *Marine Mammal Science, 31*(4), 1427–1451.

Mahaffy, S. D., R. W. Baird , D. J. McSweeney, D. L. Webster , and G. S. Schorr. (2015b). *Group structure and mating strategies of Cuvier's (Ziphius cavirostris) and Blainville's (Mesoplodon densirostris) beaked whales off the island of Hawaii*. Paper presented at the Society for Marine Mammalogy 21st biennial conference of the biology of marine mammals. San Francisco, CA.

Maloni, M., J. A. Paul, and D. M. Gligor. (2013). Slow steaming impacts on ocean carriers and shippers. *Maritime Economics & Logistics, 15*(2), 151–171.

Manzano-Roth, R., E. E. Henderson, S. W. Martin, C. Martin, and B. M. Matsuyama. (2016). Impacts of U.S. Navy Training Events on Blainville's Beaked Whale (*Mesoplodon densirostris*) Foraging Dives in Hawaiian Waters. *Aquatic Mammals, 42*(4), 507–518.

Manzano-Roth, R. A., E. E. Henderson, S. W. Martin, and B. Matsuyama. (2013). *The Impact of a U.S. Navy Training Event on Beaked Whale Dives in Hawaiian Waters. July 2013*. Pearl Harbor, HI: Commander, U.S. Pacific Fleet.

Martien, K. K., R. W. Baird, N. M. Hedrick, A. M. Gorgone, J. L. Thieleking, D. J. McSweeney, K. M. Robertson, and D. L. Webster. (2012). Population structure of island-associated dolphins: Evidence from mitochondrial and microsatellite markers for common bottlenose dolphins (*Tursiops truncatus*) around the main Hawaiian Islands. *Marine Mammal Science, 28*(3), E208–E232.

Martin, B., D. G. Zeddies, B. Gaudet, and J. Richard. (2016a). Evaluation of three sensor types for particle motion measurement. *Advances in Experimental Medicine and Biology, 875*, 679–686.

Martin, C. R., S. W. Martin, E. E. Henderson, T. A. Helble, R. A. Manzano-Roth, and B. M. Matsuyama. (2016b). *SSC Pacific FY15 annual report on PMRF Marine Mammal Monitoring* (Submitted in Support of the U.S. Navy's 2015 Annual Marine Species Monitoring Report for the Pacific). San Diego, CA: National Marine Mammal Foundation.

Martin, S. W., C. R. Martin, B. M. Matsuyama, and E. E. Henderson. (2015). Minke whales (*Balaenoptera acutorostrata*) respond to navy training. *The Journal of the Acoustical Society of America, 137*(5), 2533–2541.

Mate, B. R., R. Gisiner, and J. Mobley. (1998). Local and migratory movements of Hawaiian humpback whales tracked by satellite telemetry. *Canadian Journal of Zoology, 76*(5), 863–868.

Mate, B. R., D. M. Palacios, L. M. Irvine, B. A. Lagerquist, T. Follett, M. H. Winsor, and C. Hayslip. (2015). *Baleen (Blue & Fin) Whale Tagging in Southern California in Support of Marine Mammal Monitoring Across Multiple Navy Training Areas (SOCAL, NWTRC, GOA); Final Report*. Pearl Harbor, HI: U.S. Pacific Fleet.

Mate, B. R., D. M. Palacios, C. S. Baker, B. A. Lagerquist, L. M. Irvine, T. Follett, D. Steel, C. Hayslip, and M. H. Winsor. (2016). *Baleen (Blue and Fin) Whale Tagging in Southern California in Support of Marine Mammal Monitoring Across Multiple Navy Training Areas. Final Report.* Pearl Harbor, HI: Naval Facilities Engineering Command, Pacific.

Mate, B. R., D. M. Palacios, C. S. Baker, B. A. Lagerquist, L. M. Irvine, T. Follett, D. Steel, C. Hayslip, and M. H. Winsor. (2017). *Baleen Whale Tagging in Support of Marine Mammal Monitoring Across Multiple Navy Training Areas Covering the Years 2014, 2015, and 2016. Final Report*. Pearl Harbor, HI: Naval Facilities Engineering Command, Pacific.

McCarthy, E., D. Moretti, L. Thomas, N. DiMarzio, R. Morrissey, S. Jarvis, J. Ward, A. Izzi, and A. Dilley. (2011). Changes in spatial and temporal distribution and vocal behavior of Blainville's beaked whales (*Mesoplodon densirostris*) during multiship exercises with mid-frequency sonar. *Marine Mammal Science, 27*(3), E206–E226.

McCauley, R. D., J. Fewtrell, A. J. Duncan, C. Jenner, M.-N. Jenner, J. D. Penrose, R. I. T. Prince, A. Adhitya, J. Murdoch, and K. McCabe. (2000a). Marine seismic surveys: A study of environmental implications. *Australian Petroleum Production Exploration Association Journal, 2000*, 692–708.

McCauley, R. D., J. Fewtrell, A. J. Duncan, C. Jenner, M.-N. Jenner, J. D. Penrose, R. I. T. Prince, A. Adhitya, J. Murdoch, and K. A. McCabe. (2000b). *Marine Seismic Surveys: Analysis and Propagation of Air-gun Signals; and Effects of Air-gun Exposure on Humpback Whales, Sea Turtles, Fishes and Squid*. Bentley, Australia: Centre for Marine Science and Technology.

McDonald, M. A., J. A. Hildebrand, S. M. Wiggins, D. W. Johnston, and J. J. Polovina. (2009). An acoustic survey of beaked whales at Cross Seamount near Hawaii. *The Journal of the Acoustical Society of America, 125*(2), 624–627.

McKenna, M. F., D. Ross, S. M. Wiggins, and J. A. Hildebrand. (2012). Underwater radiated noise from modern commercial ships. *The Journal of the Acoustical Society of America, 131*(1), 92–103.

McSweeney, D. J., R. W. Baird, and S. D. Mahaffy. (2007). Site fidelity, associations, and movements of Cuvier's (*Ziphius Cavirostris*) and Blainville's (*Mesoplodon Densirostris*) beaked whales off the island of Hawaii. *Marine Mammal Science, 23*(3), 666–687.

McSweeney, D. J., R. W. Baird, S. D. Mahaffy, D. L. Webster, and G. S. Schorr. (2009). Site fidelity and association patterns of a rare species: Pygmy killer whales (*Feresa attenuata*) in the main Hawaiian Islands. *Marine Mammal Science, 25*(3), 557–572.

Mead, J. G. (1981). First records of *Mesoplodon hectori* (Ziphiidae) from the Northern Hemisphere and a description of the adult male. *Journal of Mammalogy, 62*(2), 430–432.

Mead, J. G. (1989). Beaked whales of the genus *Mesoplodon*. In S. H. Ridgway & R. Harrison (Eds.), *Handbook of Marine Mammals* (Vol. 4, pp. 349–430). San Diego, CA: Academic Press.

Melcón, M. L., A. J. Cummins, S. M. Kerosky, L. K. Roche, S. M. Wiggins, and J. A. Hildebrand. (2012). Blue whales respond to anthropogenic noise. *PLoS ONE, 7*(2).

Mignucci-Giannoni, A. A. (1998). Zoogeography of cetaceans off Puerto Rico and the Virgin Islands. *Caribbean Journal of Science, 34*(3–4), 173–190.

Miksis-Olds, J. L., and S. M. Nichols. (2015). Is low frequency ocean sound increasing globally? *The Journal of the Acoustical Society of America, 139*(1), 501–511.

Miller, P. J. O., N. Biassoni, A. Samuels, and P. L. Tyack. (2000). Whale songs lengthen in response to sonar. *Nature, 405*(6789), 903.

Mintz, J. D. (2016). *Characterization of Vessel Traffic in the Vicinities of HRC, SOCAL, and the Navy Operating Areas off the U.S. East Coast*. Alexandria, VA: Center for Naval Analyses.

Mobley, J. R., G. B. Bauer, and L. M. Herman. (1999). Changes over a ten-year interval in the distribution and relative abundance of humpback whales (*Megaptera novaeangliae*) wintering in Hawaiian waters. *Aquatic Mammals, 25*(2), 63–72.

Mobley, J. R., S. Spitz, and R. Grotefendt. (2001). *Abundance of Humpback Whales in Hawaiian Waters: Results of 1993–2000 Aerial Surveys*. Honolulu, HI: Hawaiian Islands Humpback Whale National Marine Sanctuary, Department of Land and Natural Resources, State of Hawaii.

Mobley, J. R. (2004). *Results of Marine Mammal Surveys on U.S. Navy Underwater Ranges in Hawaii and Bahamas*. Arlington, VA: Office of Naval Research.

Mobley, J. R. (2005). Assessing responses of humpback whales to North Pacific Acoustic Laboratory (NPAL) transmissions: Results of 2001–2003 aerial surveys north of Kauai. *The Journal of the Acoustical Society of America, 117*, 1666–1773.

Mobley, J. R., and A. Milette. (2010). *Aerial Survey Monitoring for Marine Mammals and Sea Turtles in the Hawaiian Range Complex in Conjunction with a Navy Training Event, SCC February 16–21, 2010, Final Field Report*. Pearl Harbor, HI: Commander, U.S. Pacific Fleet.

Mobley, J. R., and A. F. Pacini. (2012). *Aerial Survey Monitoring for Marine Mammals and Sea Turtles in the Hawaii Range Complex in Conjunction with a Navy Training Event, SCC February 15–25, 2010, Final Field Report*. Pearl Harbor, HI: Commander, U.S. Pacific Fleet.

Mobley, J. R., M. A. Smultea, C. E. Bacon, and A. S. Frankel. (2012). *Preliminary Report: Aerial Survey Monitoring for Marine Mammals and Sea Turtles in the Hawaii Range Complex--Summary of Focal Follow Analysis for 2008–2012 SCC Events: Preliminary Report*. Pearl Harbor, HI: Commander, U.S. Pacific Fleet.

Mobley, J. R., and A. F. Pacini. (2013). *Aerial Survey Monitoring for Marine Mammals and Sea Turtles in the Hawaii Range Complex in Conjunction with a Navy Training Event, SCC February 19-21 and August 12-13, 2013, Final Field Report*. Pearl Harbor, HI: U.S. Navy Pacific Fleet.

Mobley, J. R., and M. H. Deakos. (2015). *Aerial Shoreline Surveys for Marine Mammals and Sea Turtles in the Hawaii Range Complex, Conducted after Navy Training Events. Koa Kai Surveys: 31 January and 5 February 2014. RIMPAC Surveys: 1 and 4–6 July 2014*. Pearl Harbor, HI: Commander, U.S. Pacific Fleet.

Mobley, J. R., M. H. Deakos, S. W. Martin, and R. Manzano-Roth. (2015). *Aerial Survey Monitoring for Marine Mammals and Sea Turtles in the Hawaii Range Complex in Conjunction with a Navy Training Event: SCC 18–20 February 2014, Final Report*. Pearl Harbor, HI: Commander, U.S. Pacific Fleet.

Monnahan, C. C. (2013). *Population Trends of the Eastern North Pacific Blue Whale.* (Unpublished master's thesis). University of Washington, Seattle, WA. Retrieved from http://digital.lib.washington.edu.

Monnahan, C. C., T. A. Branch, K. M. Stafford, Y. V. Ivashchenko, and E. M. Oleson. (2014). Estimating historical eastern North Pacific blue whale catches using spatial calling patterns. *PLoS ONE, 9*(6), e98974.

Monnahan, C. C., T. A. Branch, and A. E. Punt. (2015). Do ship strikes threaten the recovery of endangered eastern North Pacific blue whales? *Marine Mammal Science, 31*(1), 279–297.

Moore, J., and J. Barlow. (2017). *Population Abundance and Trend Estimates for Beaked Whales and Sperm Whales in the California Current from Ship-Based Visual Line-Transect Survey Data, 1991–2014* (National Oceanic and Atmospheric Administration Technical Memorandum NMFS-SWFSC-585). La Jolla, CA: Southwest Fisheries Science Center.

Moore, J. E., and J. Barlow. (2011). Bayesian state-space model of fin whale abundance trends from a 1991–2008 time series of line-transect surveys in the California Current. *Journal of Applied Ecology, 48*(5), 1195–1205.

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

Morato, T., D. A. Varkey, C. Damaso, M. Machete, M. Santos, R. Prieto, R. S. Santos, and T. J. Pitcher. (2008). Evidence of a seamount effect on aggregating visitors. *Marine Ecological Progress Series, 357*, 23–32.

Morato, T., P. I. Miller, D. C. Dunn, S. J. Nicol, J. Bowcott, and P. N. Halpin. (2015). A perspective on the importance of oceanic fronts in promoting aggregation of visitors to seamounts. *Fish and Fisheries, 17*(4), 1227–1233.

Moretti, D. (2017). *Marine Mammal Monitoring on Navy Ranges (M3R) Passive Acoustic Monitoring of Abundance on the Pacific Missile Range Facility (PMRF) and Southern California Offshore Range (SCORE)*. Newport, RI: Naval Undersea Warfare Center.

Moretti, D. J., and R. W. Baird. (2015). *Marine Mammal Monitoring on Navy Ranges (M3R), An Opportunistic Study of the Effect of Sonar on Marine Mammals on the Pacific Missile Range Facility (PMRF): FY14 Summary*. Newport, RI: Cascadia Research Collective, Naval Undersea Warfare Center.

Muto, M. M., V. T. Helker, R. P. Angliss, B. A. Allen, P. L. Boveng, J. M. Breiwick, M. F. Cameron, P. J. Clapham, S. P. Dahle, M. E. Dahlheim, B. S. Fadely, M. C. Ferguson, L. W. Fritz, R. C. Hobbs, Y. V. Ivashchenko, A. S. Kennedy, J. M. London, S. A. Mizroch, R. R. Ream, E. L. Richmond, K. E. W. Shelden, R. G. Towell, P. R. Wade, J. M. Waite, and A. R. Zerbini. (2017). *Alaska Marine Mammal Stock Assessments, 2016* (NOAA Technical Memorandum NMFS-AFSC-323). Seattle, WA: National Marine Mammal Laboratory.

National Marine Fisheries Service. (2007). *Biological Opinion on the U.S. Navy's Proposed Undersea Warfare Training Exercises in the Hawaii Range Complex from January 2007 Through January 2009*. Silver Spring, MD: U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service.

National Marine Fisheries Service. (2012). *Annual Landings by Species for Hawaii as of 10 January 2012*. Retrieved from https://www.st.nmfs.noaa.gov/commercial-fisheries/commercial-landings/annual-landings/index.

National Marine Fisheries Service. (2015). *Reinitiated Biological Opinion and Conference Report on U.S. Navy Hawaii-Southern California Training and Testing*. Washington, DC: The United States Navy and National Oceanic and Atmospheric Administration's National Marine Fisheries Service, Office of Protected Resources' Permits and Conservation Division.

National Marine Fisheries Service. (2016a). Protective Regulations for Hawaiian Spinner Dolphins Under the Marine Mammal Protection Act. *Federal Register, 81*(164), 57854–57876.

National Marine Fisheries Service. (2016b). Endangered and Threatened Species; Identification of 14 Distinct Population Segments of the Humpback Whale (*Megaptera novaeangliae*) and Revision of Species-Wide Listing. *Federal Register, 81*(174), 62260–62320.

National Marine Fisheries Service. (2016c). *Enhancing Protections for Hawaiian Spinner Dolphins to Prevent Disturbance: Draft Environmental Impact Statement and Regulatory Impact Review*. Honolulu, HI: Pacific Islands Regional Office.

National Marine Fisheries Service. (2017). *Finding of No Significant Impact for the Proposed Issuance of an Incidental Harassment Authorization to the U.S. Air Force, Eglin Air Force Base to Take Marine Mammals Incidental to Conducting Maritime Weapon Systems Evaluation Program Operational Testing within the Eglin Gulf Test and Training Range*. Silver Spring, MD: U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service.

National Marine Protected Areas Center. (2008). *Framework for the National System of Marine Protected Areas of the United States of America*. Silver Spring, MD: U.S. Department of Commerce, National Oceanic and Atmospheric Administration, Office of Ocean and Coastal Resource Management.

National Oceanic and Atmospheric Administration. (2013). *NOAA/NOS and USCGS Seabed Descriptions from Hydrographic Surveys*. Retrieved from https://maps.ngdc.noaa.gov/viewers/bathymetry/.

Norris, K. S., and T. P. Dohl. (1980). Behavior of the Hawaiian spinner dolphin, *Stenella longirostris*. *Fishery Bulletin, 77*(4), 821–849.

Norris, T. F., M. McDonald, and J. Barlow. (1999). Acoustic detections of singing humpback whales (*Megaptera novaeangliae*) in the eastern North Pacific during their northbound migration. *The Journal of the Acoustical Society of America, 106*(1), 506–514.

Nowacek, D., L. H. Thorne, D. Johnston, and P. Tyack. (2007). Responses of cetaceans to anthropogenic noise. *Mammal Review, 37*(2), 81–115.

Nowacek, D. P., C. W. Clark, D. Mann, P. J. O. Miller, H. C. Rosenbaum, J. S. Golden, M. Jasny, J. Kraska, and B. L. Southall. (2015). Marine seismic surveys and ocean noise: Time for coordinated and prudent planning. *Frontiers in Ecology and the Environment, 13*(7), 378–386.

Oleson, E. M., J. Calambokidis, E. Falcone, G. Schorr, and J. A. Hildebrand. (2009). *Acoustic and visual monitoring for cetaceans along the outer Washington coast*. San Diego, CA: University of California San Diego Scripps Institution of Oceanography and Cascadia Research Collective.

Oleson, E. M., C. H. Boggs, K. A. Forney, M. B. Hanson, D. R. Kobayashi, B. L. Taylor, P. R. Wade, and G. M. Ylitalo. (2010). *Status Review of Hawaiian Insular False Killer Whales (Pseudorca crassidens) under the Endangered Species Act* (NOAA Technical Memorandum NMFS-PIFSC-22). Honolulu, HI: Pacific Islands Fisheries Science Center.

Oleson, E. M., R. W. Baird, K. K. Martien, and B. L. Taylor. (2013). *Island-associated stocks of odontocetes in the main Hawaiian Islands: A synthesis of available information to facilitate evaluation of stock structure* (Pacific Islands Fisheries Science Center Working Paper WP-13-003). Honolulu, HI: Pacific Islands Fisheries Science Center.

Oleson, E. M., S. Baumann-Pickering, A. Širović, K. P. Merkens, L. M. Munger, J. S. Trickey, and P. Fisher-Pool. (2015). *Analysis of long-term acoustic datasets for baleen whales and beaked whales within the Mariana Islands Range Complex (MIRC) for 2010 to 2013* (Pacific Islands Fisheries Science Center Data Report DR-15-002). Honolulu, HI: Pacific Islands Fisheries Science Center.

Oswald, J. N., J. Barlow, and T. F. Norris. (2003). Acoustic identification of nine delphinid species in the eastern tropical Pacific Ocean. *Marine Mammal Science, 19*(1), 20–37.

Pack, A. A., L. M. Herman, A. S. Craig, S. S. Spitz, J. O. Waterman, E. Y. K. Herman, M. H. Deakos, S. Hakala, and C. Lowe. (2017). Habitat preferences by individual humpback whale mothers in the Hawaiian breeding grounds vary with the age and size of their calves. *Animal Behaviour, 133*, 131–144.

Pickard, G. L., and W. J. Emery. (1990). *Descriptive Physical Oceanography: An Introduction* (5th ed.). Oxford, UK: Pergamon Press.

Pine, M. K., A. G. Jeffs, D. Wang, and C. A. Radford. (2016). The potential for vessel noise to mask biologically important sounds within ecologically significant embayments. *Ocean & Coastal Management, 127*, 63–73.

Pirotta, E., M. Mangel, D. P. Costa, B. Mate, J. A. Goldbogen, D. M. Palacios, L. A. Hückstädt, E. A. McHuron, L. Schwarz, and L. New. (2018). A Dynamic State Model of Migratory Behavior and Physiology to Assess the Consequences of Environmental Variation and Anthropogenic Disturbance on Marine Vertebrates. *The American Naturalist, 191*(2), 17.

Pitcher, T. J., T. Morato, P. J. B. Hart, M. R. Clark, N. Haggan, and R. S. Santos. (2007). The depths of ignorance: an ecosystem evaluation framework for seamount ecology, fisheries and conservation. In T. J. Pitcher, T. Morato, P. J. B. Hart, M. R. Clark, N. Haggan, & R. S. Santos (Eds.), *Seamounts: Ecology, Conservation and Management. Fish and Aquatic Resources Series* (pp. 476–488). Oxford, UK: Blackwell.

Pitcher, T. J., T. Morato, K. Stocks, and C. M. C. (2010). Seamount Ecosystem Evaluation Framework (SEEF): a tool for global seamount research and data synthesis. *Oceanography, 23*(1), 123–125.

Pitman, R. L., D. W. K. Au, M. D. Scott, and J. M. Cotton. (1988). *Observations of Beaked Whales (Ziphiidae) from the Eastern Tropical Pacific Ocean*. Cambridge, United Kingdom: International Whaling Commission.

Pitman, R. L., and C. Stinchcomb. (2002). Rough-toothed dolphins (*Steno bredanensis*) as predators of mahimahi (*Coryphaena hippurus*). *Pacific Science, 56*(4), 447–450.

Pittman, S. J., A. J. Winship, M. Poti, B. P. Kinlan, J. B. Leirness, R. W. Baird, J. Barlow, E. A. Becker, K. A. Forney, M. C. Hill, J. Mobley, P. I. Miller, and E. M. Oleson. (2016). Chapter 6: Marine Mammals. In B. M. Costa & M. S. Kendall (Eds.), *Marine Biogeographic Assessment of the Main Hawaiian Islands. Bureau of Ocean Energy Management and National Oceanic and Atmospheric Administration. OCS Study BOEM 2016-035 and NOAA Technical Memorandum NOS NCCOS 214* (pp. 227–265). Bureau of Ocean Energy Management and National Oceanic and Atmospheric Administration.

Psarakos, S., D. L. Herzing, and K. Marten. (2003). Mixed-species associations between Pantropical spotted dolphins (*Stenella attenuata*) and Hawaiian spinner dolphins (*Stenella longirostris*) off Oahu, Hawaii. *Aquatic Mammals, 29*, 390–395.

Rankin, S., and J. Barlow. (2007). Sounds recorded in the presence of Blainville's beaked whales, *Mesoplodon densirostris*, near Hawaii. *The Journal of the Acoustical Society of America, 122*(1), 42–45.

Reeves, R. R., S. Leatherwood, and R. W. Baird. (2009). Evidence of a possible decline since 1989 in false killer whales (*Pseudorca crassidens*) around the main Hawaiian islands. *Pacific Science, 63*(2), 253–261.

Rice, A. C., S. Baumann-Pickering, A. Sirovic, J. A. Hildebrand, A. J. Debich, A. Meyer-Löbbecke, B. J. Thayre, J. S. Trickey, and S. M. Wiggins. (2017). *Passive Acoustic Monitoring for Marine Mammals in the SOCAL Range Complex June 2015–April 2016* (MPL Technical Memorandum #610). La Jolla, CA: Marine Physical Laboratory.

Richardson, W. J., M. A. Fraker, B. Würsig, and R. S. Wells. (1985). Behaviour of bowhead whales (*Balaena mysticetus*) summering in the Beaufort Sea: Reactions to industrial activities. *Biological Conservation, 32*, 195–230.

Ritter, F. (2002). Behavioural observations of rough-toothed dolphins (*Steno bredanensis*) off La Gomera, Canary Islands (1995–2000), with special reference to their interactions with humans. *Aquatic Mammals, 28*(1), 46–59.

Rockwood, R. C., J. Calambokidis, and J. Jahncke. (2017). High mortality of blue, humpack and fin whales from modeling of vessel collisions on the U.S. West Coast suggests population impacts and insufficient protection. *PLoS ONE, 12*(8), e0183052.

Rossman, S., E. B. McCabe, N. B. Barros, H. G. Gandhi, P. H. Ostrom, C. A. Stricker, and R. S. Wells. (2015). Foraging habits in a generalist predator: Sex and age influence habitat selection and resource use among bottlenose dolphins (*Tursiops truncatus*). *Marine Mammal Science, 31*(1), 155–168.

Salden, D. R., L. M. Herman, M. Yamaguchi, and F. Sato. (1999). Multiple visits of individual humpback whales (*Megaptera novaeangliae*) between the Hawaiian and Japanese winter grounds. *Canadian Journal of Zoology, 77*, 504–508.

Salvadeo, C. J., A. Gomez-Gallardo U., M. Najera-Caballero, J. Urban-Ramirez, and D. Lluch-Belda. (2015). The effect of climate variability on gray whales (*Eschrichtius robustus*) within their wintering areas. *PLoS ONE, 10*(8), 1–17.

Scales, K. L., G. S. Schorr, E. L. Hazen, S. J. Bograd, P. I. Miller, R. D. Andrews, A. N. Zerbini, and E. A. Falcone. (2017). Should I stay or should I go? Modelling year-round habitat suitability and drivers of residency for fin whales in the California Current. *Biodiversity Research, 23*(10), 1204–1215.

Schorr, G. S., R. W. Baird, M. B. Hanson, D. L. Webster, D. J. McSweeney, and R. D. Andrews. (2008). *Movements of the first satellite-tagged Cuvier's and Blainville's beaked whales in Hawaii*. La Jolla, CA: Southwest Fisheries Science Center.

Schorr, G. S., R. W. Baird, M. B. Hanson, D. L. Webster, D. J. McSweeney, and R. D. Andrews. (2010). Movements of satellite-tagged Blainville's beaked whales off the island of Hawai'i. *Endangered Species Research, 10*, 203–213.

Schorr, G. S., E. A. Falcone, D. J. Moretti, and R. D. Andrews. (2014). First long-term behavioral records from Cuvier's beaked whales (*Ziphius cavirostris*) reveal record-breaking dives. *PLoS ONE, 9*(3), e92633.

Schorr, G. S., E. A. Falcone, and B. K. Rone. (2017). *Distribution and Demographics of Cuvier's Beaked Whales and Fin Whales in the Southern California Bight* (Annual report for on-water surveys conducted in conjunction with Marine Mammal Monitoring on Navy Ranges). Seabeck, WA: Marine Ecology and Telemetry Research.

Schorr, G. S., E. A. Falcone, B. K. Rone, and E. L. Keene. (2018). *Distribution and Demographics of Cuvier's Beaked Whales in the Southern California Bight*. Seabeck, WA: Marine Ecology and Telemetry Research.

Seamount Ecosystem Evaluation Framework. (2013). *Seamount Attributes*. Retrieved from https://sites.google.com/a/seamounteef.org/www/seamount-attributes.

Shallenberger, E. W. (1981). *The Status of Hawaiian Cetaceans*. Kailua, HI: Manta Corporation.

Shoemaker, M., T. Moll, K. Ampela, and T. Jefferson. (2014). *Final Cruise Report, Marine Species Monitoring & Lookout Effectiveness Study, Koa Kai, January 2014, Hawaii Range Complex*. Pearl Harbor, HI: U.S. Navy Pacific Fleet.

Silva, T. L., T. A. Mooney, L. S. Sayigh, P. L. Tyack, R. W. Baird, and J. N. Oswald. (2016). Whistle characteristics and daytime dive behavior in pantropical spotted dolphins (*Stenella attenuata*) in Hawai measured using digital acoustic recording tags (DTAGs). *The Journal of the Acoustical Society of America, 140*(1), 421–429.

Širović, A., A. Rice, E. Chou, J. A. Hildebrand, S. M. Wiggins, and M. A. Roch. (2015). Seven years of blue and fin whale call abundance in the Southern California Bight. *Endangered Species Research, 28*, 61–76.

Širović, A., S. Baumann-Pickering, J. A. Hildebrand, A. J. Debich, S. T. Herbert, A. Meyer-Löbbecke, A. Rice, B. Thayre, J. S. Trickey, S. M. Wiggins, and M. A. Roch. (2016). *Passive Acoustic Monitoring for Marine Mammals in the SOCAL Range Complex July 2014–May 2015* (Marine Physical Laboratory Technical Memorandum #607). La Jolla, CA: Marine Physical Laboratory, Scripps Institution of Oceanography, University of California; Department of Computer Science, San Diego State University.

Širović, A., E. M. Oleson, J. Buccowich, A. Rice, and A. R. Bayless. (2017). Fin whale song variability in southern California and the Gulf of California. *Scientific Reports, 7*(1), 10126.

Sivle, L. D., P. H. Kvadsheim, C. Curé, S. Isojunno, P. J. Wensveen, F. A. Lam, F. Visser, L. Kleivane, P. L. Tyack, C. M. Harris, and P. J. O. Miller. (2015). Severity of expert-identified behavioural responses of humpback whale, minke whale, and northern bottlenose whale to naval sonar. *Aquatic Mammals, 41*(4), 469–502.

Smultea, M. (2014). Changes in Relative Occurrence of Cetaceans in the Southern California Bight: A Comparison of Recent Aerial Survey Results with Historical Data Sources. *Aquatic Mammals, 40*(1), 32–43.

Smultea, M. A., and J. R. Mobley, Jr. (2009). *Aerial Survey Monitoring of Marine Mammals and Sea Turtles in Conjunction with SCC OPS Navy Exercises off Kauai, 18–21 August 2008, Final Report, May 2009*. Pearl Harbor, HI: Naval Facilities Engineering Command Pacific.

Smultea, M. A., and K. Lomac-MacNair. (2016). Assessing 'Observer Effects' from a Research Aircraft on Behavior of Three Delphinidae Species (*Grampus griseus*, *Delphinus delphis*, and *Orcinus orca*). *Wildlife Biology in Practice, 12*(2), 75–90.

Southall, B., J. Calambokidis, J. Barlow, D. Moretti, A. Friedlaender, A. Stimpert, A. Douglas, K. Southall, S. Arranz, S. DeRuiter, E. Hazen, J. Goldbogen, E. Falcone, and G. Schorr. (2013). *Biological and Behavioral Response Studies of Marine Mammals in Southern California, 2012 ("SOCAL-12")*. Pearl Harbor, HI: U.S. Navy Pacific Fleet.

Southall, B. L., A. E. Bowles, W. T. Ellison, J. J. Finneran, R. L. Gentry, C. R. Greene, D. Kastak, D. R. Ketten, J. H. Miller, P. E. Nachtigall, W. J. Richardson, J. A. Thomas, and P. L. Tyack. (2009). Marine mammal noise and exposure criteria: Initial scientific recommendations. *The Journal of the Acoustical Society of America, 125*(4), 2517.

Sumich, J. L., and I. T. Show. (2011). Offshore migratory corridors and aerial photogrammetric body length comparisons of southbound gray whales, *Eschrichtius robustus*, in the Southern California Bight, 1988–1990. *Marine Fisheries Review, 73*(1), 28–34.

Tyack, P., W. Zimmer, D. Moretti, B. Southall, D. Claridge, J. Durban, C. Clark, A. D'Amico, N. DiMarzio, S. Jarvis, E. McCarthy, R. Morrissey, J. Ward, and I. Boyd. (2011). Beaked Whales Respond to Simulated and Actual Navy Sonar. *PLoS ONE, 6*(3), 15.

Tyack, P. L., J. Calambokidis, A. Friedlaender, J. Goldbogen, and B. Southall. (2015). Formal Comment on Schorr GS, Falcone EA, Moretti DJ, Andrews RD (2014) First Long-Term Behavioral Records from Cuvier's Beaked Whales (*Ziphius cavirostris*) Reveal Record-Breaking Dives. *PLoS ONE, 9*(3), 1–3.

Tyne, J. A., K. H. Pollock, D. W. Johnston, and L. Bejder. (2014). Abundance and survival rates of the Hawaii Island associated spinner dolphin (*Stenella longirostris*) stock. *PLoS ONE, 9*(1), e86132.

Tyne, J. A. (2015). *A scientific foundation for informed management decisions: Quantifying the abundance, important habitat and cumulative exposure of the Hawaii Island spinner dolphin (Stenella longirostris) stock to human activities.* (Unpublished doctoral dissertation in Philosophy). Murdoch University, Murdoch, AUS. Retrieved from https://www.researchgate.net/publication/311608220_A_scientific_foundation_for_informed_management_decisions_Quantifying_the_abundance_important_habitat_and_cumulative_exposure_of_the_Hawaii_Island_spinner_dolphin_Stenella_longirostris_stock_to_human_.

Tyne, J. A., D. W. Johnston, R. Rankin, N. R. Loneragan, L. Bejder, and A. Punt. (2015). The importance of spinner dolphin (*Stenella longirostris*) resting habitat: Implications for management. *Journal of Applied Ecology, 52*(3), 621–630.

Tyne, J. A., N. R. Loneragan, D. W. Johnston, K. H. Pollock, R. Williams, and L. Bejder. (2016). Evaluating monitoring methods for cetaceans. *Biological Conservation, 201*, 252–260.

Tyne, J. A., D. W. Johnston, F. Christiansen, and L. Bejder. (2017). Temporally and spatially partitioned behaviours of spinner dolphins: Implications for resilience to human disturbance. *Royal Society Open Science, 4*(1), 160626.

U.S. Department of the Navy. (2006a). *Rim of the Pacific Exercise After Action Report: Analysis of Effectiveness of Mitigation and Monitoring Measures as Required Under the Marine Mammals Protection Act (MMPA) Incidental Harassment Authorization and the National Defense Exemption from the Requirements of the MMPA for Mid-Frequency Active Sonar Mitigation Measures*.

U.S. Department of the Navy. (2006b). *2006 Supplement to the 2002 Rim of the Pacific (RIMPAC) Programmatic Environmental Assessment (PEA)*. Washington, DC: U.S. Department of the Navy.

U.S. Department of the Navy. (2009). *Record of Decision for the Undersea Warfare Training Range*. Washington, DC: U.S. Department of Defense.

U.S. Department of the Navy. (2017a). *Criteria and Thresholds for U.S. Navy Acoustic and Explosive Effects Analysis (Phase III)*. San Diego, CA: Space and Naval Warfare System Command, Pacific.

U.S. Department of the Navy. (2017b). *U.S. Navy Marine Species Density Database Phase III for the Hawaii-Southern California Training and Testing Study Area* (Naval Facilities Engineering Command Pacific Technical Report). Pearl Harbor, HI: Naval Facilities Engineering Command Pacific.

U.S. Department of the Navy. (2018). *Quantifying Acoustic Impacts on Marine Mammals and Sea Turtles: Methods and Analytical Approach for Phase III Training and Testing* (Technical Report prepared by NUWC Division Newport, Space and Naval Warfare Systems Center Pacific, G2 Software Systems, and the National Marine Mammal Foundation). Newport, RI: Naval Undersea Warfare Center.

Van Cise, A. M., P. A. Morin, R. W. Baird, A. R. Lang, K. M. Robertson, S. J. Chivers, R. L. J. Brownell, and K. K. Martien. (2016). Redrawing the map: mtDNA provides new insight into the distribution and diversity of short-finned pilot whales in the Pacific Ocean. *Marine Mammal Science, 32*(4), 1177–1199.

Van der Hoop, J. M., M. J. Moore, S. G. Barco, T. V. Cole, P. Y. Daoust, A. G. Henry, D. F. McAlpine, W. A. McLellan, T. Wimmer, and A. R. Solow. (2013). Assessment of management to mitigate anthropogenic effects on large whales. *Conservation Biology: The Journal of the Society for Conservation Biology, 27*(1), 121–133.

Van der Hoop, J. M., A. S. M. Vanderlaan, T. V. N. Cole, A. G. Henry, L. Hall, B. Mase-Guthrie, T. Wimmer, and M. J. Moore. (2015). Vessel Strikes to Large Whales Before and After the 2008 Ship Strike Rule. *Conservation Letters, 8*(1), 24–32.

Van Parijs, S. M. (2015). Letter of Introduction to the Biologically Important Areas Issue. *Aquatic Mammals, 41*(1), 1–128.

Van Parijs, S. M., C. Curtice, and M. C. Ferguson, (Eds.). (2015). Biologically Important Areas for cetaceans within U.S. waters. *Aquatic Mammals (Special Issue), 41*(1), 128.

Van Waerebeek, K., A. N. Baker, F. Felix, J. Gedamke, M. Iñiguez, G. P. Sanino, E. Secchi, D. Sutaria, A. van Helden, and Y. Wang. (2007). Vessel collisions with small cetaceans worldwide and with large whales in the southern hemisphere, an initial assessment. *Latin American Journal of Aquatic Mammals, 6*(1), 43–69.

Vanderlaan, M. S. A., and T. C. Taggart. (2007). Vessel collisions with whales: The probability of lethal injury based on vessel speed. *Marine Mammal Science, 23*(1), 144–156.

Villegas-Amtmann, S., L. K. Schwarz, J. L. Sumich, and D. P. Costa. (2015). A bioenergetics model to evaluate demographic consequences of disturbance in marine mammals applied to gray whales. *Ecosphere, 6*(10), 1–19.

Wade, P. R., T. J. Quinn, II, J. Barlow, C. S. Baker, A. M. Burdin, J. Calambokidis, P. J. Clapham, E. A. Falcone, J. K. B. Ford, C. M. Gabriele, D. K. Mattila, L. Rojas-Bracho, J. M. Straley, and B. Taylor. (2016). *Estimates of abundance and migratory destination for North Pacific humpback whales in both summer feeding areas and winter mating and calving areas* (SC/66b/IA/21). Washington, DC: International Whaling Commission.

Watkins, W. A. (1981). Reaction of three species of whales *Balaenoptera physalus*, *Megaptera novaeangliae*, and *Balaenoptera edeni* to implanted radio tags. *Deep-Sea Research, 28A*(6), 589–599.

Webster, D. L., R. W. Baird, B. K. Rone, and D. B. Anderson. (2015). *Rough-toothed dolphins on a Navy range in Hawaii: using LIMPET satellite-tag data to assess movements, habitat use, and overlap with Navy activities.* Paper presented at the Poster presented at the 21st Biennial Conference on the Biology of Marine Mammals. San Francisco, CA. http://www.cascadiaresearch.org/Hawaii/Websteretal_2015_SMM.pdf.

West, K. (2016). *Necropsy Findings, Stomach Contents and Hook Ingestion in IFKW's*. Honolulu, HI: University of Hawaii, Hawaii Pacific University.

Western Pacific Regional Fishery Management Council. (2009). *Fishery Ecosystem Plan for the Hawaii Archipelago*. Honolulu, HI: Western Pacific Regional Fishery Management Council.

Williams, R., C. Erbe, E. Ashe, A. Beerman, and J. Smith. (2014). Severity of killer whale behavioral responses to ship noise: a dose-response study. *Marine Pollution Bulletin, 79*(1–2), 254–260.

Zoidis, A. M., K. S. Lomac-MacNair, A. E. Chomos-Betz, A. J. Day, and S. A. McFarland. (2014). Effects of sex, seasonal period, and sea state on calf behavior in Hawaiian humpback whales (*Megaptera novaeangliae*). *Aquatic Mammals, 40*(1), 44–58.