return or destruction of proprietary information disclosed under APO in accordance with 19 CFR 351.305. Timely notification of the return or destruction of APO materials or conversion to judicial protective orders is hereby requested. Failure to comply with the regulations and terms of an APO is a violation which is subject to sanction.

We are issuing and publishing the results and notice in accordance with sections 751(c), 752(c), and 777(i)(1) of the Act.

Dated: June 28, 2016.

Paul Piquado,

Assistant Secretary for Enforcement and Compliance.

[FR Doc. 2016–16053 Filed 7–6–16; 8:45 am]

BILLING CODE 3510–DS–P

DEPARTMENT OF COMMERCE

International Trade Administration

[A–570–042]

Stainless Steel Sheet and Strip From the People's Republic of China: Postponement of Preliminary Determination of Antidumping Duty Investigation

AGENCY: Enforcement and Compliance, International Trade Administration, Department of Commerce.

DATES: *Effective Date:* July 7, 2016.

FOR FURTHER INFORMATION CONTACT: Toni Page at (202) 482–1398 or Lingjun Wang at (202) 482–2316, AD/CVD Operations, Enforcement and Compliance, U.S. Department of Commerce, 14th Street and Constitution Avenue NW., Washington, DC 20230.

SUPPLEMENTARY INFORMATION:

Background

On March 3, 2016, the Department of Commerce (Department) initiated an antidumping duty (AD) investigation of imports of stainless steel sheet and strip from the People's Republic of China.[1] The notice of initiation stated that, in accordance with section 733(b)(1)(A) of the Tariff Act of 1930, as amended (the Act), and 19 CFR 351.205(b)(1), we would issue our preliminary determination no later than 140 days after the date of initiation, unless postponed. Currently, the preliminary determination is due no later than July 21, 2016.

[1] *See Stainless Steel Sheet and Strip From the People's Republic of China: Initiation of Less Than Fair Value Investigations,* 81 FR 12711 (March 10, 2016).

Postponement of Preliminary Determinations

Sections 733(c)(1)(B)(i) and (ii) of the Act permit the Department to postpone the time limit for the preliminary determination if it concludes that the parties concerned are cooperating and determines that the case is extraordinarily complicated by reason of the number and complexity of the transactions to be investigated or adjustments to be considered, the novelty of the issues presented, or the number of firms whose activities must be investigated, and additional time is necessary to make the preliminary determination. Under this section of the Act, the Department may postpone the preliminary determination until no later than 190 days after the date on which the Department initiated the investigation.

The Department determines that the parties involved in this investigation are cooperating, and that the investigation is extraordinarily complicated. Additional time is required to analyze the questionnaire responses and issue any appropriate requests for clarification and additional information.

Therefore, in accordance with section 733(c)(1)(B) of the Act and 19 CFR 351.205(f)(1), the Department is postponing the time period for the preliminary determination of this investigation by 50 days, to September 9, 2016. Pursuant to section 735(a)(1) of the Act and 19 CFR 351.210(b)(1), the deadline for the final determination will continue to be 75 days after the date of the preliminary determination, unless postponed at a later date.

This notice is issued and published pursuant to section 733(c)(2) of the Act and 19 CFR 351.205(f)(1).

Dated: June 30, 2016.

Ronald K. Lorentzen,

Acting Assistant Secretary for Enforcement and Compliance.

[FR Doc. 2016–16134 Filed 7–6–16; 8:45 am]

BILLING CODE 3510–DS–P

DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

RIN 0648–XE675

Takes of Marine Mammals Incidental to Specified Activities; Taking Marine Mammals Incidental to the U.S. Air Force 86 Fighter Weapons Squadron Conducting Long Range Strike Weapon Systems Evaluation Program at the Pacific Missile Range Facility at Kauai, Hawaii

AGENCY: National Marine Fisheries Service (NMFS), National Oceanic and Atmospheric Administration (NOAA), Commerce.

ACTION: Notice; proposed incidental harassment authorization; request for comments.

SUMMARY: NMFS (hereinafter, ''we'' or ''our'') received an application from the U.S. Department of the Air Force, 86 Fighter Weapons Squadron (86 FWS), requesting an Incidental Harassment Authorization (IHA) to take marine mammals, by harassment, incidental to a Long Range Strike Weapon Systems Evaluation Program (LRS WSEP) in the Barking Sands Underwater Range Extension (BSURE) area of the Pacific Missile Range Facility (PMRF) at Kauai, Hawaii. 86 FWS's activities are military readiness activities per the Marine Mammal Protection Act (MMPA), as amended by the National Defense Authorization Act (NDAA) for Fiscal Year 2004. Pursuant to the MMPA, NMFS requests comments on its proposal to issue an IHA to 86 FWS to incidentally take, by Level A and Level B harassment, two species of marine mammals, the dwarf sperm whale (*Kogia sima*) and pygmy sperm whale (*Kogia breviceps)* during the specified activity.

DATES: NMFS must receive comments and information no later than August 8, 2016.

ADDRESSES: Comments on the application should be addressed to Jolie Harrison, Chief, Permits and Conservation Division, Office of Protected Resources, National Marine Fisheries Service, 1315 East-West Highway, Silver Spring, MD 20910. The email address for providing email comments is *ITP.McCue@noaa.gov.* Please include 0648–XE675 in the subject line. Comments sent via email, including all attachments, must not exceed a 25-megabyte file size. NMFS is not responsible for comments sent to addresses other than the one provided in this notice.

Instructions: All submitted comments are a part of the public record, and generally we will post them to *http://www.nmfs.noaa.gov/pr/permits/incidental/military.htm* without change. All Personal Identifying Information (for example, name, address, *etc.*) voluntarily submitted by the commenter may be publicly accessible. Do not submit confidential business information or otherwise sensitive or protected information.

An electronic copy of the application may be obtained by writing to the address specified above, telephoning the contact listed below (see **FOR FURTHER INFORMATION CONTACT**), or visiting the internet at: *http://www.nmfs.noaa.gov/pr/permits/incidental/military.htm.* The following associated documents are also available at the same internet address: List of the references used in this document, and 86 FWS's Environmental Assessment (EA) titled, ''Environmental Assessment/Overseas Environmental Assessment for the Long Range Strike Weapon Systems Evaluation Program Operational Evaluations.'' Documents cited in this notice may also be viewed, by appointment, during regular business hours, at the aforementioned address.

FOR FURTHER INFORMATION CONTACT: Laura McCue, Office of Protected Resources, NMFS, (301) 427–8401.

SUPPLEMENTARY INFORMATION:

Background

Sections 101(a)(5)(A) and (D) of the MMPA(16 U.S.C. 1361 *et seq.*) direct the Secretary of Commerce to allow, upon request, the incidental, but not intentional, taking of small numbers of marine mammals of a species or population stock, by U.S. citizens who engage in a specified activity (other than commercial fishing) within a specified geographical region if certain findings are made and either regulations are issued or, if the taking is limited to harassment, a notice of a proposed authorization is provided to the public for review.

An authorization for incidental takings for marine mammals shall be granted if NMFS finds that the taking will have a negligible impact on the species or stock(s), will not have an unmitigable adverse impact on the availability of the species or stock(s) for subsistence uses (where relevant), and if the permissible methods of taking and requirements pertaining to the mitigation, monitoring, and reporting of such taking are set forth. NMFS has defined ''negligible impact'' in 50 CFR 216.103 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.''

The NDAA of 2004 (Pub. L. 108–136) removed the ''small numbers'' and ''specified geographical region'' limitations indicated earlier and amended the definition of harassment as it applies to a ''military readiness activity'' to read as follows (Section 3(18)(B) of the MMPA): (i) Any act that injures or has the significant potential to injure a marine mammal or marine mammal stock in the wild [Level A Harassment]; or (ii) any act that disturbs or is likely to disturb a marine mammal or marine mammal stock in the wild by causing disruption of natural behavioral patterns, including, but not limited to, migration, surfacing, nursing, breeding, feeding, or sheltering, to a point where such behavioral patterns are abandoned or significantly altered [Level B Harassment].

Summary of Request

On May 12, 2016, NMFS received an application from 86 FWS for the taking of marine mammals, by harassment, incidental to the LRS WSEP within the PMRF in Kauai, Hawaii from September 1, 2016 through August 31, 2017. 86 FWS submitted a revised version of the renewal request on June 9, 2016 and June 20, 2016, which we considered adequate and complete.

The proposed LRS WSEP training activities would occur on September 1, 2016, with a backup date of September 2, 2016.

86 FWS proposes actions that include LRS WSEP test missions of the Joint Air-To-Surface Stand-off Missile (JASSM) and the Small Diameter Bomb–I/II (SDB–I/II) including detonations at the water surface. These activities qualify as a military readiness activities under the MMPA and NDAA.

The following aspects of the proposed LRS WSEP training activities have the potential to take marine mammals: Munition strikes and detonation effects (overpressure and acoustic components). Take, by Level B harassment of individuals of dwarf sperm whale and pygmy sperm whale could potentially result from the specified activity. Additionally, although NMFS does not expect it to occur, 86 FWS has also requested authorization for Level A Harassment of one individual dwarf sperm whale. Therefore, 86 FWS has requested authorization to take individuals of two cetacean species by Level A and Level B harassment.

86 FWS's LRS WSEP training activities may potentially impact marine mammals at or near the water surface in the absence of mitigation. Marine mammals could potentially be harassed, injured, or killed by exploding and non-exploding projectiles, falling debris, or ingestion of military expended materials. However, based on analyses provided in 86 FWS's 2016 application, 2016 Environmental Assessment (EA), and for reasons discussed later in this document, we do not anticipate that 86 FWS's LRS WSEP activities would result in any serious injury or mortality to marine mammals.

Description of the Specified Activity

Overview

86 FWS proposes to conduct air-to-surface mission in the BSURE area of the PMRF. The LRS WSEP test objective is to conduct operational evaluations of long range strike weapons and other munitions as part of LRS WSEP operations to properly train units to execute requirements within Designed Operational Capability Statements, which describe units' real-world operational expectations in a time of war. Due to threats to national security, increased missions involving air-to-surface activities have been directed by the Department of Defense (DoD). Accordingly, the U.S. Air Force seeks the ability to conduct operational evaluations of all phases of long range strike weapons within the U.S. Navy's Hawaii Range Complex (HRC). The actions would fulfill the Air Force's requirement to evaluate full-scale maneuvers for such weapons, including scoring capabilities under operationally realistic scenarios. LRS WSEP objectives are to evaluate air-to-surface and maritime weapon employment data, evaluate tactics, techniques, and procedures in an operationally realistic environment, and to determine the impact of tactics, techniques, and procedures on combat Air Force training. The munitions associated with the proposed activities are not part of a typical unit's training allocations, and prior to attending a WSEP evaluation, most pilots and weapon systems officers have only dropped weapons in simulators or used the aircraft's simulation mode. Without WSEP operations, pilots would be using these weapons for the first time in combat. On average, half of the participants in each unit drop an actual weapon for the first time during a WSEP evaluation. Consequently, WSEP is a military readiness activity and is the last opportunity for squadrons to receive operational training and evaluations before they deploy.

Dates and Duration

86 FWS proposes to schedule the LRS WSEP training missions over one day on September 1, 2016, with a backup day the following day. The proposed missions would occur on a weekday during daytime hours only, with all missions occurring in one day. This IHA would be valid from September 1, 2016 through August 31, 2017.

Specified Geographic Region

The specific planned impact area is approximately 44 nautical miles (nm)(81 kilometers (km)) offshore of Kauai, Hawaii, in a water depth of about 15,240 feet (ft) (4,645 meters (m)) (see Figure 2–2 of 86 FWS's application). All activities will take place within the PMRF, which is located in Hawaii off the western shores of the island of Kauai and includes broad ocean areas to the north, south, and west (see Figure 2–1 of 86 FWS's application).

Within the PMRF, activities would occur in the BSURE area, which lies in Warning Area 188 (W–188). The BSURE consists of about 900 nm^2 of instrumented underwater ranges, encompassing the deepwater portion of the PMRF and providing over 80 percent of PMRF's underwater scoring capability. The BSURE facilitates training, tactics, development, and test and evaluation for air, surface, and subsurface weapons systems in deep water. It provides a full spectrum of range support, including radar, underwater instrumentation, telemetry, electronic warfare, remote target command and control, communications, data display and processing, and target/weapon launching and recovery facilities. The underwater tracking system begins 9 nm (17 km) from the north shore of Kauai and extends out to 40 nm (74 km) from shore. LRS WSEP missions would employ live weapons with long flight paths requiring large amounts of airspace and conclude with weapon impact and surface detonations within the BSURE instrumented range.

Detailed Description of Activities

The LRS WSEP training missions, classified as military readiness activities, refer to the deployment of live (containing explosive charges) missiles from aircraft toward the water surface. The actions include air-to-surface test missions of the JASSM and the SDB–I/II including detonations at the water surface.

Aircraft used for munition releases would include bombers and fighter aircraft. Additional airborne assets, such as the P–3 Orion or the P–8 Poseidon, would be used to relay telemetry (TM) and flight termination system (FTS) streams between the weapon and ground stations. Other support aircraft would be associated with range clearance activities before and during the mission and with air-to-air refueling operations. All weapon delivery aircraft would originate from an out base and fly into military-controlled airspace prior to employment. Due to long transit times between the out base and mission location, air-to-air refueling may be conducted in either W–188 or W–189. Bombers, such as the B–1, would deliver the weapons, conduct air-to-air refueling, and return to their originating base as part of one sortie. However, when fighter aircraft are used, the distance and corresponding transit time to the various potential originating bases would make return flights after each mission day impractical. In these cases, the aircraft would temporarily (less than one week) park overnight at Hickam Air Force Base (HAFB) and would return to their home base at the conclusion of each mission set. Multiple weapon release aircraft would be used during some missions, each potentially releasing multiple munitions. The LRS WSEP missions scheduled for 2016 are proposed to occur in one day, with the following day reserved as a back-up day. Approximately 10 Air Force personnel would be on temporary duty to support the mission.

Aircraft flight maneuver operations and weapon release would be conducted in W–188A boundaries of PMRF. Chase aircraft may be used to evaluate weapon release and to track weapons. Flight operations and weapons delivery would be in accordance with published Air Force directives and weapon operational release parameters, as well as all applicable Navy safety regulations and criteria established specifically for PMRF. Aircraft supporting LSR WSEP missions would primarily operate at high altitudes—only flying below 3,000 feet for a limited time as needed for escorting non-military vessels outside the hazard area or for monitoring the area for protected marine species (*e.g.,* marine mammals, sea turtles). Protected marine species aerial surveys would be temporary and would focus on an area surrounding the weapon impact point on the water.

Post-mission surveys would focus on the area down current of the weapon impact location. Range clearance procedures for each mission would cover a much larger area for human safety. Weapon release parameters would be conducted as approved by PMRF Range Safety. Daily mission briefs would specify planned release conditions for each mission. Aircraft and weapons would be tracked for time, space, and position information. The 86 FWS test director would coordinate with the PMRF Range Safety Officer, Operations Conductor, Range Facility Control Officer, and other applicable mission control personnel for aircraft control, range clearance, and mission safety.

Joint Air-to-Surface Stand-Off Missile/Joint Air-to-Surface Stand-Off Missile-Extended Range (JASSM/JASSM–ER)

The JASSM is a stealthy precision cruise missile designed for launch outside area defenses against hardened, medium-hardened, soft, and area type targets. The JASSM has a range of more than 200 nm (370 km) and carries a 1,000-pound (lb) warhead with approximately 300 lbs of 2,4,6-trinitrotoluene (TNT) equivalent net explosive weight (NEW). The specific explosive used is AFX–757, a type of plastic bonded explosive (PBX). The weapon has the capability to fly a preprogrammed route from launch to a target, using Global Positioning System (GPS) technology and an internal navigation system (INS) combined with a Terminal Area Model when available. Additionally, the weapon has a Common Low Observable Auto-Routing function that gives the weapon the ability to find the route that best utilizes the low observable qualities of the JASSM. In either case, these routes can be modeled prior to weapon release. The JASSM–ER has additional fuel and a different engine for a greater range than the JASSM (500 nm (926 km)) but maintains the same functionality of the JASSM.

Small Diameter Bomb–I/Small Diameter Bomb–II (SDB–I/SDB–II)

The SDB–I is a 250-lb air-launched GPS–INS guided weapon for fixed soft to hardened targets. SDB–II expands the SDB–I capability with network enabling and uses a tri-mode sensor infrared, millimeter, and semi-active laser to attack both fixed and movable targets. Both munitions have a range of up to 60 NM (111 km). The SDB–I contains 37 lbs of TNT-equivalent NEW, and the SDB–II contains 23 lbs NEW. The explosive used in both SDB–I and SDB–II is AFX–757.

Initial phases of the LRS WSEP operational evaluations are proposed for September 2016 and would consist of releasing only one live JASSM/JASSM–ER and up to eight SDBs in military controlled airspace (Table 1). Immediate evaluations for JASSM/JASSM–ER and SDB–I are needed; therefore, they are the only munitions being proposed for summer 2016 missions. Weapon release parameters for 2016 missions would involve a B–1 bomber releasing one live JASSM and fighter aircraft, such as F–15, F–16, or F–22, releasing live SDB–I. Up to four SDB–I munitions would be released simultaneously, similar to a ripple effect, each hitting the water surface within a few seconds of each other; however, the SDB–I releases would occur separate from the JASSM. All releases would occur on the same mission day.

TABLE 1—SUMMARY OF PROPOSED TESTING AT PMRF IN 2016

Munition	Fusing option	Net explosive weight (lb)	Detonation scenario	Annual total number of munitions
JASSM/JASSM–ER	Live/Instantaneous	300	Surface	1
SDB–I	Live/Instantaneous	37	Surface	8

ER = Extended Range; JASSM = Joint Air-to-Surface Stand-off Missile; lb = pounds; SDB = Small Diameter Bomb.

A typical mission day would consist of pre-mission checks, safety review, crew briefings, weather checks, clearing airspace, range clearance, mitigations/monitoring efforts, and other military protocols prior to launch of weapons. Potential delays could be the result of multiple factors including, but not limited to; adverse weather conditions leading to unsafe take-off, landing, and aircraft operations, inability to clear the range of non-mission vessels or aircraft, mechanical issues with mission aircraft or munitions, or presence of protected species in the impact area. If the mission is cancelled due to any of these, one back-up day has also been scheduled as a contingency. These standard operating procedures are usually done in the morning, and live range time may begin in late morning once all checks are complete and approval is granted from range control. The range would be closed to the public for a maximum of four hours per mission day.

Each long range strike weapon would be released in W–188A and would follow a given flight path with programmed GPS waypoints to mark its course in the air. Long range strike weapons would complete their maximum flight range (up to 500 nm distance for JASSM–ER) at an altitude of approximately 18,000 ft (equivalent in kms) mean sea level (MSL) and terminate at a specified location for scoring of the impact. The cruise time would vary among the munitions but would be about 45 minutes for JASSM/JASSM–ER and 10 minutes for SDB–I/II. The time frame between employments of successive munitions would vary, but releases could be spaced by approximately one hour to account for the JASSM cruise time. The routes and associated safety profiles would be contained within W–188A boundaries. The objective of the route designs is to complete full-scale evasive maneuvers that avoid simulated threats and would, therefore, not consist of a standard ''paper clip'' or regularly shaped route. The final impact point on the water surface would be programmed into the munitions for weapons scoring and evaluations.

All missions would be conducted in accordance with applicable flight safety, hazard area, and launch parameter requirements established for PMRF. A weapon hazard region would be established, with the size and shape determined by the maximum distance a weapon could travel in any direction during its descent. The hazard area is typically adjusted for potential wind speed and direction, resulting in a maximum composite safety footprint for each mission (each footprint boundary is at least 10 nm from the Kauai coastline). This information is used to establish a Launch Exclusion Area and Aircraft Hazard Area. These exclusion areas must be verified to be clear of all non-mission and non-essential vessels and aircraft before live weapons are released. In addition, a buffer area must also be clear on the water surface so that vessels do not enter the exclusion area during the launch window. Prior to weapon release, a range sweep of the hazard area would be conducted by participating mission aircraft or other appropriate aircraft, potentially including S–61N helicopter, C–26 aircraft, fighter aircraft (F–15E, F–16, F–22), or the Coast Guard's C–130 aircraft.

PMRF has used small water craft docked at the Port Allen public pier to keep nearshore areas clear of tour boats for some mission launch areas. However, for missions with large hazard areas that occur far offshore from Kauai, it would be impractical for these smaller vessels to conduct range clearance activities. The composite safety footprint weapons associated with LRS WSEP missions is anticipated to be rather large; therefore, it is likely that range clearing activities would be conducted solely by aircraft.

The Range Facility Control Officer is responsible for establishing hazard clearance areas, directing clearance and surveillance assets, and reporting range status to the Operations Conductor. The Control Officer is also responsible for submitting all Notice to Airmen (NOTAMs) and Notice to Mariners (NOTMARs), and for requesting all Federal Aviation Administration airspace clearances.

Description of Marine Mammals in the Area of the Specified Activity

There are 25 marine mammal species with potential or confirmed occurrence in the proposed activity area; however, not all of these species occur in this region during the project timeframe. Table 2 lists and summarizes key information regarding stock status and abundance of these species. Please see NMFS' 2015 Stock Assessment Reports (SAR), available at *www.nmfs.noaa.gov/pr/sars* for more detailed accounts of these stocks' status and abundance.

TABLE 2—MARINE MAMMALS THAT COULD OCCUR IN THE BSURE AREA

Species	Stock	ESA/MMPA Status; Strategic (Y/N) [1]	Stock abundance (CV, Nmin, most recent abundance survey) [2]	PBR [3]	Occurrence in BSURE Area
Order Cetartiodactyla—Cetacea—Superfamily Mysticeti (baleen whales)					
Family: Balaenopteridae					
Humpback whale (*Megaptera novaeangliae*).[4]	Central North Pacific	Y; Y	10,103 (0.300; 7,890; 2006)	83	Seasonal; throughout known breeding grounds during winter and spring (most common November through April).
Blue Whale (*Balaenoptera musculus)*.	Central North Pacific	Y; Y	81 (1.14; 38; 2010)	0.1	Seasonal; infrequent winter migrant; few sightings, mainly fall and winter; considered rare.
Fin whale (*Balaenoptera physalus*.	Hawaii	Y; Y	58 (1.12; 27; 2010)	0.1	Seasonal, mainly fall and winter; considered rare.
Sei whale (*Balaenoptera borealis)*.	Hawaii	Y; Y	178 (0.90; 93; 2010)	0.2	Rare; limited sightings of seasonal migrants that feed at higher latitudes.
Bryde's whale (*Balaenoptera brydei/edeni)*.	Hawaii	-; N	798 (0.28; 633; 2010)	6.3	Uncommon; distributed throughout the Hawaiian EEZ.
Minke whale (*Balaenoptera acutorostrata)*.	Hawaii	-; N	n/a (n/a; n/a; 2010)	Undet.	Regular but seasonal (October–April).
Order Cetartiodactyla—Cetacea—Superfamily Odontoceti (toothed whales, dolphins, and porpoises)					
Family: Physeteridae					
Sperm whale (*Physeter macrocephalus*).	Hawaii	Y; Y	3,354 (0.34; 2,539; 2010)	10.2	Widely distributed year round; more likely in waters >1,000 m depth, most often >2,000 m.
Order Cetartiodactyla—Cetacea—Superfamily Odontoceti (toothed whales, dolphins, and porpoises)					
Family: Kogiidae					
Pygmy sperm whale (*Kogia breviceps*).	Hawaii	-; N	n/a (n/a; n/a; 2010)	Undet.	Widely distributed year round; more likely in waters >1,000 m depth.
Dwarf sperm whale (*Kogia sima*).	Hawaii	-; N	n/a (n/a; n/a; 2010)	Undet.	Widely distributed year round; more likely in waters >500 m depth.
Order Cetartiodactyla—Cetacea—Superfamily Odontoceti (toothed whales, dolphins, and porpoises)					
Family delphinidae					
Killer whale (*Orcinus orca*)	Hawaii	-; N	101 (1.00; 50; 2010)	1	Uncommon; infrequent sightings.
False killer whale (*Pseudorca crassidens*).	Hawaii Pelagic NWHI Stock	-; N -; N	1,540 (0.66; 928; 2010) 617 (1.11; 290; 2010)	9.3 2.3	Regular. Regular.
Pygmy killer whale (*Feresa attenuata*).	Hawaii	-; N	3,433 (0.52; 2,274; 2010)	23	Year-round resident.
Short-finned pilot whale (*Globicephala macrorhynchus*).	Hawaii	-; N	12,422 (0.43; 8,872; 2010)	70	Commonly observed around Main Hawaiian Islands and Northwestern Hawaiian Islands.
Melon headed whale (*Peponocephala electra)*.	Hawaii Islands stock	-; N	5,794 (0.20; 4,904; 2010)	4	Regular.
Bottlenose dolphin (*Tursiops truncatus*).	Hawaii pelagic	-; N	5,950 (0.59; 3,755; 2010)	38	Common in deep offshore waters.
Pantropical spotted dolphin (*Stenella attenuata*).	Hawaii pelagic	-; N	15,917 (0.40; 11,508; 2010)	115	Common; primary occurrence between 100 and 4,000 m depth.

TABLE 2—MARINE MAMMALS THAT COULD OCCUR IN THE BSURE AREA—Continued

Species	Stock	ESA/MMPA Status; Strategic (Y/N) [1]	Stock abundance (CV, Nmin, most recent abundance survey) [2]	PBR [3]	Occurrence in BSURE Area
Striped dolphin (*Stenella coeruleoala*).	Hawaii	-; N	20,650 (0.36; 15,391; 2010)	154	Occurs regularly year round but infrequent sighting during survey.
Spinner dolphin (*Stenella longirostris*).	Hawaii pelagic	-; N	n/a (n/a; n/a; 2010)	Undet.	Common year-round in offshore waters.
Rough-toothed dolphins (*Steno bredanensis*).	Hawaii stock	-; N	6,288 (0.39; 4,581; 2010)	46	Common throughout the Main Hawaiian Islands and Hawaiian Islands EEZ.
Fraser's dolphin (*Lagenodelphis hosei*).	Hawaii	-; N	16,992 (0.66; 10,241; 2010)	102	Tropical species only recently documented within Hawaiian Islands EEZ (2002 survey).
Risso's dolphin (*Grampus griseus*).	Hawaii	-; N	7,256 (0.41; 5,207; 2010)	42	Previously considered rare but multiple sightings in Hawaiian Islands EEZ during various surveys conducted from 2002–2012.
Order Cetartiodactyla—Cetacea—Superfamily Odontoceti (toothed whales, dolphins, and porpoises)					
Family: Ziphiidae					
Cuvier's beaked whale (*Ziphius cavirostris*).	Hawaii	-; N	1,941 (n/a; 1,142; 2010)	11.4	Year-round occurrence but difficult to detect due to diving behavior.
Blainville's beaked whale (*Mesoplodon densirostris*).	Hawaii	-; N	2,338 (1.13; 1,088; 2010)	11	Year-round occurrence but difficult to detect due to diving behavior.
Longman's beaked whale (*Indopacetus pacificus*).	Hawaii	-; N	4,571 (0.65; 2,773; 2010)	28	Considered rare; however, multiple sightings during 2010 survey.
Order—Carnivora—Superfamily Pinnipedia (seals, sea lions)					
Family: Phocidae					
Hawaiian monk seal (*Neomonachus schauinslandi*).	Hawaii	Y; Y	1,112 (n/a; 1,088; 2013)	Undet.	Predominantly occur at Northwestern Hawaiian Islands; approximately 138 individuals in Main Hawaiian Islands.

[1] ESA status: Endangered (E), Threatened (T)/MMPA status: Depleted (D). A dash (-) indicates that the species is not listed under the ESA or designated as depleted under the MMPA. Under the MMPA, a strategic stock is one for which the level of direct human-caused mortality exceeds PBR (see footnote 3) or which is determined to be declining and likely to be listed under the ESA within the foreseeable future. Any species or stock listed under the ESA is automatically designated under the MMPA as depleted and as a strategic stock.

[2] CV is coefficient of variation; N_{min} is the minimum estimate of stock abundance. In some cases, CV is not applicable. For certain stocks, abundance estimates are actual counts of animals and there is no associated CV. The most recent abundance survey that is reflected in the abundance estimate is presented; there may be more recent surveys that have not yet been incorporated into the estimate. All values presented here are from the 2015 Pacific SARs, except humpback whales—see comment 4.

[3] Potential biological removal, defined by the MMPA 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 size (OSP).

[4] Values for humpback whales are from the 2015 Alaska SAR.

Of these 25 species, six are listed as endangered under the ESA and as depleted throughout its range under the MMPA. These are: humpback whale, blue whale, fin whale, sei whale, sperm whale, and the Hawaiian monk seal.

Of the 25 species that may occur in Hawaiian waters, only certain stocks occur in the impact area, while others are island-associated or do not occur at the depths of the impact area (*e.g.* false killer whale insular stock, island-associated stocks of bottlenose, spinner, and spotted dolphins). Only two species are considered likely to be in the impact area during the one day of project activities (dwarf sperm whale and pygmy sperm whale). Other species are seasonal and only occur in these waters in the fall or winter (humpback whale, blue whale, fin whale, sei whale, minke whale, killer whale); some are rare in the area (Longman's beaked whale, Bryde's whale); and others are unlikely to be impacted due to small density estimates (False killer whale, pygmy killer whale, short-finned pilot whale, melon-headed whale, bottlenose dolphin, Pantropical spotted dolphin, striped dolphin, spinner dolphin, rough-toothed dolphin, Fraser's dolphin, Risso's dolphin, Cuvier's beaked whale, Blainville's beaked whale, and Hawaiian monk seal). Because these 22 species are unlikely to occur within the BSURE area, 86 FWS has not requested and NMFS has not proposed the issuance of take authorizations for them. Thus, NMFS does not consider these species further in this notice.

We have reviewed 86 FWS's species descriptions, including life history information, distribution, regional distribution, diving behavior, and acoustics and hearing, for accuracy and completeness. We refer the reader to Sections 3 and 4 of 86 FWS's application and to Chapter 3 in 86 FWS's EA rather than reprinting the information here.

Below, for those species that are likely to be taken by the activities described, we offer a brief introduction to the species and relevant stock as well as available information regarding population trends and threats, and describe any information regarding local occurrence.

Dwarf Sperm Whale

Dwarf sperm whales are found throughout the world in tropical to warm-temperate waters (Caretta *et al.,* 2014). They are usually found in waters deeper than 500 m, most often sighted in depths between 500 and 1,000 m, but they have been documented in depths as shallow as 106 m and as deep as 4,700 m (Baird, in press). This species is often alone or in small groups of up to two to four individuals (average group size of 2.7 individuals), with a maximum group size observed of eight individuals (Baird, in press). When there are more than two animals together, they are often loosely associated, with up to several hundred meters between pairs of individuals (Baird, in press).

There is one stock of dwarf sperm whales in Hawaii. Sighting data suggests a small resident population off Hawaii Island (Baird, in press). There are no current abundance estimates for this stock. In 2002, a survey off Hawaii estimated the abundance at 17,159; however, this data is outdated and is no longer used. PBR cannot be calculated due to insufficient data. It has been suggested that this species is probably one of the more abundant species of cetaceans in Hawaiian waters (Baird, in press). One of their main threats is interactions with fisheries; however, dwarf sperm whales are also sensitive to high-intensity underwater sounds and navy sonar testing. This stock is not listed as endangered under the ESA and is not considered strategic or designated as depleted under the MMPA (Caretta *et al.,* 2013).

Pygmy Sperm Whale

Pygmy killer whales are found in tropical and subtropical waters throughout the world (Ross and Leatherwood 1994). This species prefers deeper waters, with observations of this species in greater than 4,000 m depth (Baird *et al.,* 2013); and, based on stomach contents from stranded individuals, pygmy sperm whales forage between 600 and 1,200 m depth (Baird, in press). Sightings are rare of this species, but observations include lone individuals or pairs, with an average group size of 1.5 individuals (Baird, in press).

There is a single stock of Pygmy killer whales in Hawaii. Current abundance estimates for this stock are unknown. A 2002 survey in Hawaii estimated 7,138 animals; however, this data is outdated and is no longer used. PBR cannot be calculated due to insufficient data. (Caretta *et al.,* 2014). The main threats to this species are fisheries interactions and effects from underwater sounds such as active sonar (Caretta *et al.,* 2014). This stock is not listed as endangered under the ESA, and is not considered strategic or designated as depleted under the MMPA (Caretta *et al.,* 2014).

Potential Effects of the Specified Activity on Marine Mammals and Their Habitat

This section includes a summary and discussion of the ways that components (*e.g.,* munition strikes and detonation effects) of the specified activity, including mitigation, may impact marine mammals and their habitat. The *Estimated Take by Incidental Harassment* section later in this document will include a quantitative analysis of the number of individuals that we expect 86 FWS to take during this activity. The *Negligible Impact Analysis* section will include the analysis of how this specific activity would impact marine mammals, and will consider the content of this section, the *Estimated Take by Incidental Harassment* section and the *Proposed Mitigation* section to draw conclusions regarding the likely impacts of these activities on the reproductive success or survivorship of individuals and from that on the affected marine mammal populations or stocks. In the following discussion, we provide general background information on sound and marine mammal hearing before considering potential effects to marine mammals from sound produced by surface detonations.

Description of Sound Sources and WSEP Sound Types

Sound travels in waves, the basic components of which are frequency, wavelength, velocity, and amplitude. Frequency is the number of pressure waves that pass by a reference point per unit of time and is measured in hertz (Hz) or cycles per second. Wavelength is the distance between two peaks of a sound wave. Amplitude is the height of the sound pressure wave or the ''loudness'' of a sound and is typically measured using the decibel (dB) scale. A dB is the ratio between a measured pressure (with sound) and a reference pressure (sound at a constant pressure, established by scientific standards). It is a logarithmic unit that accounts for large variations in amplitude; therefore, relatively small changes in dB ratings correspond to large changes in sound pressure. When referring to sound pressure levels (SPLs; the sound force per unit area), sound is referenced in the context of underwater sound pressure to 1 microPascal (μPa). One pascal is the pressure resulting from a force of one newton exerted over an area of one square meter. The source level (SL) represents the sound level at a distance of 1 m from the source (referenced to 1 μPa). The received level is the sound level at the listener's position. Note that we reference all underwater sound levels in this document to a pressure of 1 μPa and all airborne sound levels in this document are referenced to a pressure of 20 μPa.

Root mean square (rms) is the quadratic mean sound pressure over the duration of an impulse. Rms is calculated by squaring all of the sound amplitudes, averaging the squares, and then taking the square root of the average (Urick, 1983). Rms accounts for both positive and negative values; squaring the pressures makes all values positive so that one can account for the values in the summation of pressure levels (Hastings and Popper, 2005). This measurement is often used in the context of discussing behavioral effects, in part because behavioral effects, which often result from auditory cues, may be better expressed through averaged units than by peak pressures.

When underwater objects vibrate or activity occurs, sound-pressure waves are created. These waves alternately compress and decompress the water as the sound wave travels. Underwater sound waves radiate in all directions away from the source (similar to ripples on the surface of a pond), except in cases where the source is directional. The compressions and decompressions associated with sound waves are detected as changes in pressure by aquatic life and man-made sound receptors such as hydrophones.

Even in the absence of sound from the specified activity, the underwater environment is typically loud due to ambient sound. Ambient sound is defined as environmental background sound levels lacking a single source or point (Richardson *et al.,* 1995), and the sound level of a region is defined by the total acoustical energy being generated by known and unknown sources. These sources may include physical (*e.g.,* waves, earthquakes, ice, atmospheric sound), biological (*e.g.,* sounds produced by marine mammals, fish, and invertebrates), and anthropogenic sound (*e.g.,* vessels, dredging, aircraft, construction). A number of sources contribute to ambient sound, including the following (Richardson *et al.,* 1995):

- Wind and waves: The complex interactions between wind and water surface, including processes such as breaking waves and wave-induced bubble oscillations and cavitation, are a main source of naturally occurring ambient noise for frequencies between 200 Hz and 50 kHz (Mitson, 1995). In general, ambient sound levels tend to increase with increasing wind speed and wave height. Surf noise becomes important near shore, with measurements collected at a distance of 8.5 km from shore showing an increase of 10 dB in the 100 to 700 Hz band during heavy surf conditions.
- Precipitation: Sound from rain and hail impacting the water surface can become an important component of total noise at frequencies above 500 Hz, and possibly down to 100 Hz during quiet times.
- Biological: Marine mammals can contribute significantly to ambient noise levels, as can some fish and shrimp. The frequency band for biological contributions is from approximately 12 Hz to over 100 kHz.
- Anthropogenic: Sources of ambient noise related to human activity include transportation (surface vessels and aircraft), dredging and construction, oil and gas drilling and production, seismic surveys, sonar, explosions, and ocean acoustic studies. Shipping noise typically dominates the total ambient noise for frequencies between 20 and 300 Hz. In general, the frequencies of anthropogenic sounds are below 1 kHz and, if higher frequency sound levels are created, they attenuate rapidly (Richardson *et al.,* 1995). Sound from identifiable anthropogenic sources other than the activity of interest (*e.g.,* a passing vessel) is sometimes termed background sound, as opposed to ambient sound.

The sum of the various natural and anthropogenic sound sources at any given location and time—which comprise ''ambient'' or ''background'' sound—depends not only on the source levels (as determined by current weather conditions and levels of biological and shipping activity) but also on the ability of sound to propagate through the environment. In turn, sound propagation is dependent on the spatially and temporally varying properties of the water column and sea floor, and is frequency-dependent. As a result of the dependence on a large number of varying factors, ambient sound levels can be expected to vary widely over both coarse and fine spatial and temporal scales. Sound levels at a given frequency and location can vary by 10–20 dB from day to day (Richardson *et al.,* 1995). The result is that, depending on the source type and its intensity, sound from the specified activity may be a negligible addition to the local environment or could form a distinctive signal that may affect marine mammals.

The sounds produced by the proposed WSEP activities are considered impulsive, which is one of two general sound types, the other being non-pulsed. The distinction between these two sound types is important because they have differing potential to cause physical effects, particularly with regard to hearing (*e.g.,* Ward, 1997 in Southall *et al.,* 2007). Please see Southall *et al.* (2007) for an in-depth discussion of these concepts.

Impulsive sound sources (*e.g.,* explosions, gunshots, sonic booms, impact pile driving) produce signals that are brief (typically considered to be less than one second), broadband, atonal transients (ANSI, 1986; Harris, 1998; NIOSH, 1998; ISO, 2003) and occur either as isolated events or repeated in some succession. These sounds have a relatively rapid rise from ambient pressure to a maximal pressure value followed by a rapid decay period that may include a period of diminishing, oscillating maximal and minimal pressures, and generally have an increased capacity to induce physical injury as compared with sounds that lack these features.

Marine Mammal Hearing

Hearing is the most important sensory modality for marine mammals, and exposure to sound can have deleterious effects. To appropriately assess these potential effects, it is necessary to understand the frequency ranges marine mammals are able to hear. Current data indicate that not all marine mammal species have equal hearing capabilities (*e.g.,* Richardson *et al.,* 1995; Wartzok and Ketten, 1999; Au and Hastings, 2008). To reflect this, Southall *et al.* (2007) recommended that marine mammals be divided into functional hearing groups based on measured or estimated hearing ranges on the basis of available behavioral data, audiograms derived using auditory evoked potential techniques, anatomical modeling, and other data. The lower and/or upper frequencies for some of these functional hearing groups have been modified from those designated by Southall *et al.* (2007). The functional groups and the associated frequencies are indicated below (note that these frequency ranges do not necessarily correspond to the range of best hearing, which varies by species):

- Low frequency cetaceans (13 species of mysticetes): functional hearing is estimated to occur between approximately 7 Hz and 25 kHz (up to 30 kHz in some species), with best hearing estimated to be from 100 Hz to 8 kHz (Watkins, 1986; Ketten, 1998; Houser *et al.,* 2001; Au *et al.,* 2006; Lucifredi and Stein, 2007; Ketten *et al.,* 2007; Parks *et al.,* 2007a; Ketten and Mountain, 2009; Tubelli *et al.,* 2012);
- Mid-frequency cetaceans (32 species of dolphins, six species of larger toothed whales, and 19 species of beaked and bottlenose whales): functional hearing is estimated to occur between approximately 150 Hz and 160 kHz with best hearing from 10 to less than 100 kHz (Johnson, 1967; White, 1977; Richardson *et al.,* 1995; Szymanski *et al.,* 1999; Kastelein *et al.,* 2003; Finneran *et al.,* 2005a, 2009; Nachtigall *et al.,* 2005, 2008; Yuen *et al.,* 2005; Popov *et al.,* 2007; Au and Hastings, 2008; Houser *et al.,* 2008; Pacini *et al.,* 2010, 2011; Schlundt *et al.,* 2011);
- High frequency cetaceans (eight species of true porpoises, six species of river dolphins, and members of the genera *Kogia* and *Cephalorhynchus;* now considered to include two members of the genus *Lagenorhynchus* on the basis of recent echolocation data and genetic data [May-Collado and Agnarsson, 2006; Kyhn *et al.,* 2009, 2010; Tougaard *et al.,* 2010]): functional hearing is estimated to occur between approximately 200 Hz and 180 kHz (Popov and Supin, 1990a,b; Kastelein *et al.,* 2002; Popov *et al.,* 2005);
- Phocid pinnipeds in Water: functional hearing is estimated to occur between approximately 75 Hz and 100 kHz with best hearing between 1–50 kHz (Møhl, 1968; Terhune and Ronald, 1971, 1972; Richardson *et al.,* 1995; Kastak and Schusterman, 1999;

Reichmuth, 2008; Kastelein *et al.,* 2009); and

- Otariid pinnipeds in Water: functional hearing is estimated to occur between approximately 100 Hz and 48 kHz, with best hearing between 2–48 kHz (Schusterman *et al.,* 1972; Moore and Schusterman, 1987; Babushina *et al.,* 1991; Richardson *et al.,* 1995; Kastak and Schusterman, 1998; Kastelein *et al.,* 2005a; Mulsow and Reichmuth, 2007; Mulsow *et al.,* 2011a, b).

The pinniped functional hearing group was modified from Southall *et al.* (2007) on the basis of data indicating that phocid species have consistently demonstrated an extended frequency range of hearing compared to otariids, especially in the higher frequency range (Hemilä *et al.,* 2006; Kastelein *et al.,* 2009; Reichmuth *et al.,* 2013).

There are two marine mammal species (both cetaceans, the dwarf and pygmy sperm whale) with expected potential to co-occur with 86 FWS WSEP military readiness activities. The *Kogia* species are classified as high-frequency cetaceans. A species' functional hearing group is a consideration when we analyze the effects of exposure to sound on marine mammals.

Acoustic Impacts

Please refer to the information given previously (*Description of Sound Sources*) regarding sound, characteristics of sound types, and metrics used in this document. Anthropogenic sounds cover a broad range of frequencies and sound levels and can have a range of highly variable impacts on marine life, from none or minor to potentially severe responses, depending on received levels, duration of exposure, behavioral context, and various other factors. The potential effects of underwater sound from active acoustic sources can potentially result in one or more of the following: temporary or permanent hearing impairment, non-auditory physical or physiological effects, behavioral disturbance, stress, and masking (Richardson *et al.,* 1995; Gordon *et al.,* 2004; Nowacek *et al.,* 2007; Southall *et al.,* 2007; Götz *et al.,* 2009). The degree of effect is intrinsically related to the signal characteristics, received level, distance from the source, and duration of the sound exposure. In general, sudden, high level sounds can cause hearing loss, as can longer exposures to lower level sounds. Temporary or permanent loss of hearing will occur almost exclusively for noise within an animal's hearing range. We first describe specific manifestations of acoustic effects before providing discussion specific to 86 FWS's activities.

Richardson *et al.* (1995) described zones of increasing intensity of effect that might be expected to occur, in relation to distance from a source and assuming that the signal is within an animal's hearing range. First is the area within which the acoustic signal would be audible (potentially perceived) to the animal, but not strong enough to elicit any overt behavioral or physiological response. The next zone corresponds with the area where the signal is audible to the animal and of sufficient intensity to elicit behavioral or physiological responsiveness. Third is a zone within which, for signals of high intensity, the received level is sufficient to potentially cause discomfort or tissue damage to auditory or other systems. Overlaying these zones to a certain extent is the area within which masking (*i.e.,* when a sound interferes with or masks the ability of an animal to detect a signal of interest that is above the absolute hearing threshold) may occur; the masking zone may be highly variable in size.

We describe the more severe effects (*i.e.,* certain non-auditory physical or physiological effects and mortality) only briefly as we do not expect that there is a reasonable likelihood that 86 FWS's activities may result in such effects (see below for further discussion). Marine mammals exposed to high-intensity sound, or to lower-intensity sound for prolonged periods, can experience hearing threshold shift (TS), which is the loss of hearing sensitivity at certain frequency ranges (Kastak *et al.,* 1999; Schlundt *et al.,* 2000; Finneran *et al.,* 2002, 2005b). TS can be permanent (PTS), in which case the loss of hearing sensitivity is not fully recoverable, or temporary (TTS), in which case the animal's hearing threshold would recover over time (Southall *et al.,* 2007). Repeated sound exposure that leads to TTS could cause PTS. In severe cases of PTS, there can be total or partial deafness, while in most cases the animal has an impaired ability to hear sounds in specific frequency ranges (Kryter, 1985).

When PTS occurs, there is physical damage to the sound receptors in the ear (*i.e.,* tissue damage), whereas TTS represents primarily tissue fatigue and is reversible (Southall *et al.,* 2007). In addition, other investigators have suggested that TTS is within the normal bounds of physiological variability and tolerance and does not represent physical injury (*e.g.,* Ward, 1997). Therefore, NMFS does not consider TTS to constitute auditory injury.

Relationships between TTS and PTS thresholds have not been studied in marine mammals—PTS data exists only for a single harbor seal (Kastak *et al.,* 2008)—but are assumed to be similar to those in humans and other terrestrial mammals. PTS typically occurs at exposure levels at least several decibels above (a 40–dB threshold shift approximates PTS onset; *e.g.,* Kryter *et al.,* 1966; Miller, 1974) that inducing mild TTS (a 6–dB threshold shift approximates TTS onset; *e.g.,* Southall *et al.,* 2007). Based on data from terrestrial mammals, a precautionary assumption is that the PTS thresholds for impulse sounds (such as bombs) are at least 6 dB higher than the TTS threshold on a peak-pressure basis and PTS cumulative sound exposure level thresholds are 15 to 20 dB higher than TTS cumulative sound exposure level thresholds (Southall *et al.,* 2007). Given the higher level of sound or longer exposure duration necessary to cause PTS as compared with TTS, it is considerably less likely that PTS could occur.

Non-auditory physiological effects or injuries that theoretically might occur in marine mammals exposed to high level underwater sound or as a secondary effect of extreme behavioral reactions (*e.g.,* change in dive profile as a result of an avoidance reaction) caused by exposure to sound include neurological effects, bubble formation, resonance effects, and other types of organ or tissue damage (Cox *et al.,* 2006; Southall *et al.,* 2007; Zimmer and Tyack, 2007). 86 FWS's activities involve the use of devices such as explosives that are associated with these types of effects; however, severe injury to marine mammals is not anticipated from these activities.

When a live or dead marine mammal swims or floats onto shore and is incapable of returning to sea, the event is termed a ''stranding'' (16 U.S.C. 1421h(3)). Marine mammals are known to strand for a variety of reasons, such as infectious agents, biotoxicosis, starvation, fishery interaction, ship strike, unusual oceanographic or weather events, sound exposure, or combinations of these stressors sustained concurrently or in series (*e.g.,* Geraci *et al.,* 1999). However, the cause or causes of most strandings are unknown (*e.g.,* Best, 1982). Combinations of dissimilar stressors may combine to kill an animal or dramatically reduce its fitness, even though one exposure without the other would not be expected to produce the same outcome (*e.g.,* Sih *et al.,* 2004). For further description of stranding events see, *e.g.,* Southall *et al.,* 2006; Jepson *et al.,* 2013; Wright *et al.,* 2013.

1. *Temporary threshold shift*—TTS is the mildest form of hearing impairment that can occur during exposure to sound (Kryter, 1985). While experiencing TTS, the hearing threshold rises, and a sound must be at a higher level in order to be heard. In terrestrial and marine mammals, TTS can last from minutes or hours to days (in cases of strong TTS). In many cases, hearing sensitivity recovers rapidly after exposure to the sound ends. Few data on sound levels and durations necessary to elicit mild TTS have been obtained for marine mammals, and none of the data published at the time of this writing concern TTS elicited by exposure to multiple pulses of sound.

Marine mammal hearing plays a critical role in communication with conspecifics, and interpretation of environmental cues for purposes such as predator avoidance and prey capture. Depending on the degree (elevation of threshold in dB), duration (*i.e.,* recovery time), and frequency range of TTS, and the context in which it is experienced, TTS can have effects on marine mammals ranging from discountable to serious. For example, a marine mammal may be able to readily compensate for a brief, relatively small amount of TTS in a non-critical frequency range that occurs during a time where ambient noise is lower and there are not as many competing sounds present. Alternatively, a larger amount and longer duration of TTS sustained during time when communication is critical for successful mother/calf interactions could have more serious impacts.

Currently, TTS data only exist for four species of cetaceans (bottlenose dolphin, beluga whale [*Delphinapterus leucas*], harbor porpoise [*Phocoena phocoena],* and Yangtze finless porpoise [*Neophocoena asiaeorientalis*]) and three species of pinnipeds (northern elephant seal [*Mirounga angustirostris*], harbor seal [*Phoca vitulina*], and California sea lion [*Zalophus californianus*]) exposed to a limited number of sound sources (*i.e.,* mostly tones and octave-band noise) in laboratory settings (*e.g.,* Finneran *et al.,* 2002; Nachtigall *et al.,* 2004; Kastak *et al.,* 2005; Lucke *et al.,* 2009; Popov *et al.,* 2011). In general, harbor seals (Kastak *et al.,* 2005; Kastelein *et al.,* 2012a) and harbor porpoises (Lucke *et al.,* 2009; Kastelein *et al.,* 2012b) have a lower TTS onset than other measured pinniped or cetacean species. Additionally, the existing marine mammal TTS data come from a limited number of individuals within these species. There are no data available on noise-induced hearing loss for mysticetes. For summaries of data on TTS in marine mammals or for further discussion of TTS onset thresholds, please see Southall *et al.* (2007) and Finneran and Jenkins (2012).

2. *Behavioral effects*—Behavioral disturbance may include a variety of effects, including subtle changes in behavior (*e.g.,* minor or brief avoidance of an area or changes in vocalizations), more conspicuous changes in similar behavioral activities, and more sustained and/or potentially severe reactions, such as displacement from or abandonment of high-quality habitat. Behavioral responses to sound are highly variable and context-specific and any reactions depend on numerous intrinsic and extrinsic factors (*e.g.,* species, state of maturity, experience, current activity, reproductive state, auditory sensitivity, time of day), as well as the interplay between factors (*e.g.,* Richardson *et al.,* 1995; Wartzok *et al.,* 2003; Southall *et al.,* 2007; Weilgart, 2007; Archer *et al.,* 2010). Behavioral reactions can vary not only among individuals but also within an individual, depending on previous experience with a sound source, context, and numerous other factors (Ellison *et al.,* 2012), and can vary depending on characteristics associated with the sound source (*e.g.,* whether it is moving or stationary, number of sources, distance from the source). Please see Appendices B–C of Southall *et al.* (2007) for a review of studies involving marine mammal behavioral responses to sound.

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). Animals are most likely to habituate to sounds that are predictable and unvarying. It is important to note that habituation is appropriately considered as a ''progressive reduction in response to stimuli that are perceived as neither aversive nor beneficial,'' rather than as, more generally, moderation in response to human disturbance (Bejder *et al.,* 2009). The opposite process is sensitization, when an unpleasant experience leads to subsequent responses, often in the form of avoidance, at a lower level of exposure. As noted, behavioral state may affect the type of response. For example, animals that are resting may show greater behavioral change in response to disturbing sound levels than animals that are highly motivated to remain in an area for feeding (Richardson *et al.,* 1995; NRC, 2003; Wartzok *et al.,* 2003). Controlled experiments with captive marine mammals have shown pronounced behavioral reactions, including avoidance of loud sound sources (Ridgway *et al.,* 1997; Finneran *et al.,* 2003). Observed responses of wild marine mammals to loud pulsed sound sources (typically seismic airguns or acoustic harassment devices) have been varied but often consist of avoidance behavior or other behavioral changes suggesting discomfort (Morton and Symonds, 2002; see also Richardson *et al.,* 1995; Nowacek *et al.,* 2007).

Available studies show wide variation in response to underwater sound; therefore, it is difficult to predict specifically how any given sound in a particular instance might affect marine mammals perceiving the signal. If a marine mammal does react briefly to an underwater sound by changing its behavior or moving a small distance, the impacts of the change are unlikely to be significant to the individual, let alone the stock or population. However, if a sound source displaces marine mammals from an important feeding or breeding area for a prolonged period, impacts on individuals and populations could be significant (*e.g.,* Lusseau and Bejder, 2007; Weilgart, 2007; NRC, 2005). However, there are broad categories of potential response, which we describe in greater detail here, that include alteration of dive behavior, alteration of foraging behavior, effects to breathing, interference with or alteration of vocalization, avoidance, and flight.

Changes in dive behavior can vary widely and may consist of increased or decreased dive times and surface intervals as well as changes in the rates of ascent and descent during a dive (*e.g.,* Frankel and Clark, 2000; Costa *et al.,* 2003; Ng and Leung, 2003; Nowacek *et al.;* 2004; Goldbogen *et al.,* 2013a,b). Variations in dive behavior may reflect interruptions in biologically significant activities (*e.g.,* foraging) or they may be of little biological significance. The impact of an alteration to dive behavior resulting from an acoustic exposure depends on what the animal is doing at the time of the exposure and the type and magnitude of the response.

Disruption of feeding behavior can be difficult to correlate with anthropogenic sound exposure, so it is usually inferred by observed displacement from known foraging areas, the appearance of secondary indicators (*e.g.,* bubble nets or sediment plumes), or changes in dive behavior. As for other types of behavioral response, the frequency, duration, and temporal pattern of signal presentation, as well as differences in species sensitivity, are likely contributing factors to differences in response in any given circumstance (*e.g.,* Croll *et al.,* 2001; Nowacek *et al.;* 2004; Madsen *et al.,* 2006; Yazvenko *et al.,* 2007). A determination of whether foraging disruptions incur fitness consequences would require information on or estimates of the energetic requirements of the affected individuals and the relationship between prey availability, foraging effort and success, and the life history stage of the animal.

Variations in respiration naturally vary with different behaviors and alterations to breathing rate as a function of acoustic exposure can be expected to co-occur with other behavioral reactions, such as a flight response or an alteration in diving. However, respiration rates in and of themselves may be representative of annoyance or an acute stress response. Various studies have shown that respiration rates may either be unaffected or could increase, depending on the species and signal characteristics, again highlighting the importance in understanding species differences in the tolerance of underwater noise when determining the potential for impacts resulting from anthropogenic sound exposure (*e.g.,* Kastelein *et al.,* 2001, 2005b, 2006; Gailey *et al.,* 2007).

Marine mammals vocalize for different purposes and across multiple modes, such as whistling, echolocation click production, calling, and singing. Changes in vocalization behavior in response to anthropogenic noise can occur for any of these modes and may result from a need to compete with an increase in background noise or may reflect increased vigilance or a startle response. For example, in the presence of potentially masking signals, humpback whales and killer whales have been observed to increase the length of their songs (Miller *et al.,* 2000; Fristrup *et al.,* 2003; Foote *et al.,* 2004), while right whales have been observed to shift the frequency content of their calls upward while reducing the rate of calling in areas of increased anthropogenic noise (Parks *et al.,* 2007b). In some cases, animals may cease sound production during production of aversive signals (Bowles *et al.,* 1994).

Avoidance is the displacement of an individual from an area or migration path as a result of the presence of a sound or other stressors, and is one of the most obvious manifestations of disturbance in marine mammals (Richardson *et al.,* 1995). For example, gray whales are known to change direction—deflecting from customary migratory paths—in order to avoid noise from seismic surveys (Malme *et al.,* 1984). Avoidance may be short-term, with animals returning to the area once the noise has ceased (*e.g.,* Bowles *et al.,* 1994; Goold, 1996; Stone *et al.,* 2000; Morton and Symonds, 2002; Gailey *et al.,* 2007). Longer-term displacement is possible, however, which may lead to changes in abundance or distribution patterns of the affected species in the affected region if habituation to the presence of the sound does not occur (*e.g.,* Blackwell *et al.,* 2004; Bejder *et al.,* 2006; Teilmann *et al.,* 2006).

A flight response is a dramatic change in normal movement to a directed and rapid movement away from the perceived location of a sound source. The flight response differs from other avoidance responses in the intensity of the response (*e.g.,* directed movement, rate of travel). Relatively little information on flight responses of marine mammals to anthropogenic signals exist, although observations of flight responses to the presence of predators have occurred (Connor and Heithaus, 1996). The result of a flight response could range from brief, temporary exertion and displacement from the area where the signal provokes flight to, in extreme cases, marine mammal strandings (Evans and England, 2001). However, it should be noted that response to a perceived predator does not necessarily invoke flight (Ford and Reeves, 2008), and whether individuals are solitary or in groups may influence the response.

Behavioral disturbance can also impact marine mammals in more subtle ways. Increased vigilance may result in costs related to diversion of focus and attention (*i.e.,* when a response consists of increased vigilance, it may come at the cost of decreased attention to other critical behaviors such as foraging or resting). These effects have generally not been demonstrated for marine mammals, but studies involving fish and terrestrial animals have shown that increased vigilance may substantially reduce feeding rates (*e.g.,* Beauchamp and Livoreil, 1997; Fritz *et al.,* 2002; Purser and Radford, 2011). In addition, chronic disturbance can cause population declines through reduction of fitness (*e.g.,* decline in body condition) and subsequent reduction in reproductive success, survival, or both (*e.g.,* Harrington and Veitch, 1992; Daan *et al.,* 1996; Bradshaw *et al.,* 1998). However, Ridgway *et al.* (2006) reported that increased vigilance in bottlenose dolphins exposed to sound over a five-day period did not cause any sleep deprivation or stress effects.

Many animals perform vital functions, such as feeding, resting, traveling, and socializing, on a diel cycle (24-hour cycle). Disruption of such functions resulting from reactions to stressors such as sound exposure are more likely to be significant if they last more than one diel cycle or recur on subsequent days (Southall *et al.,* 2007). Consequently, a behavioral response lasting less than one day and not recurring on subsequent days is not considered particularly severe unless it could directly affect reproduction or survival (Southall *et al.,* 2007). Note that there is a difference between multi-day substantive behavioral reactions and multi-day anthropogenic activities. For example, just because an activity lasts for multiple days does not necessarily mean that individual animals are either exposed to activity-related stressors for multiple days or, further, exposed in a manner resulting in sustained multi-day substantive behavioral responses.

3. *Stress responses*—An animal's perception of a threat may be sufficient to trigger stress responses consisting of some combination of behavioral responses, autonomic nervous system responses, neuroendocrine responses, or immune responses (*e.g.,* Seyle, 1950; Moberg, 2000). In many cases, an animal's first and sometimes most economical (in terms of energetic costs) response is behavioral avoidance of the potential stressor. Autonomic nervous system responses to stress typically involve changes in heart rate, blood pressure, and gastrointestinal activity. These responses have a relatively short duration and may or may not have a significant long-term effect on an animal's fitness.

Neuroendocrine stress responses often involve the hypothalamus-pituitary-adrenal system. Virtually all neuroendocrine functions that are affected by stress—including immune competence, reproduction, metabolism, and behavior—are regulated by pituitary hormones. Stress-induced changes in the secretion of pituitary hormones have been implicated in failed reproduction, altered metabolism, reduced immune competence, and behavioral disturbance (*e.g.,* Moberg, 1987; Blecha, 2000). Increases in the circulation of glucocorticoids are also equated with stress (Romano *et al.,* 2004).

The primary distinction between stress (which is adaptive and does not normally place an animal at risk) and ''distress'' is the cost of the response. During a stress response, an animal uses glycogen stores that can be quickly replenished once the stress is alleviated. In such circumstances, the cost of the stress response would not pose serious fitness consequences. However, when an animal does not have sufficient energy reserves to satisfy the energetic costs of a stress response, energy resources must be diverted from other functions. This state of distress will last until the animal replenishes its energetic reserves sufficient to restore normal function.

Relationships between these physiological mechanisms, animal behavior, and the costs of stress responses are well-studied through controlled experiments and for both laboratory and free-ranging animals (*e.g.,* Holberton *et al.,* 1996; Hood *et al.,* 1998; Jessop *et al.,* 2003; Krausman *et al.,* 2004; Lankford *et al.,* 2005). Stress responses due to exposure to anthropogenic sounds or other stressors and their effects on marine mammals have also been reviewed (Fair and Becker, 2000; Romano *et al.,* 2002b) and, more rarely, studied in wild populations (*e.g.,* Romano *et al.,* 2002a). For example, Rolland *et al.* (2012) found that noise reduction from reduced ship traffic in the Bay of Fundy was associated with decreased stress in North Atlantic right whales. These and other studies lead to a reasonable expectation that some marine mammals will experience physiological stress responses upon exposure to acoustic stressors and that it is possible that some of these would be classified as ''distress.'' In addition, any animal experiencing TTS would likely also experience stress responses (NRC, 2003).

4. *Auditory masking*—Sound can disrupt behavior through masking, or interfering with, an animal's ability to detect, recognize, or discriminate between acoustic signals of interest (*e.g.,* those used for intraspecific communication and social interactions, prey detection, predator avoidance, navigation) (Richardson *et al.,* 1995). Masking occurs when the receipt of a sound is interfered with by another coincident sound at similar frequencies and at similar or higher intensity, and may occur whether the sound is natural (*e.g.,* snapping shrimp, wind, waves, precipitation) or anthropogenic (*e.g.,* shipping, sonar, seismic exploration) in origin. The ability of a noise source to mask biologically important sounds depends on the characteristics of both the noise source and the signal of interest (*e.g.,* signal-to-noise ratio, temporal variability, direction), in relation to each other and to an animal's hearing abilities (*e.g.,* sensitivity, frequency range, critical ratios, frequency discrimination, directional discrimination, age or TTS hearing loss), and existing ambient noise and propagation conditions.

Under certain circumstances, marine mammals experiencing significant masking could also be impaired from maximizing their performance fitness in survival and reproduction. Therefore, when the coincident (masking) sound is man-made, it may be considered harassment when disrupting or altering critical behaviors. It is important to distinguish TTS and PTS, which persist after the sound exposure, from masking, which occurs during the sound exposure. Because masking (without resulting in TS) is not associated with abnormal physiological function, it is not considered a physiological effect, but rather a potential behavioral effect.

The frequency range of the potentially masking sound is important in determining any potential behavioral impacts. For example, low-frequency signals may have less effect on high-frequency echolocation sounds produced by odontocetes but are more likely to affect detection of mysticete communication calls and other potentially important natural sounds such as those produced by surf and some prey species. The masking of communication signals by anthropogenic noise may be considered as a reduction in the communication space of animals (*e.g.,* Clark *et al.,* 2009) and may result in energetic or other costs as animals change their vocalization behavior (*e.g.,* Miller *et al.,* 2000; Foote *et al.,* 2004; Parks *et al.,* 2007b; Di Iorio and Clark, 2009; Holt *et al.,* 2009). Masking can be reduced in situations where the signal and noise come from different directions (Richardson *et al.,* 1995), through amplitude modulation of the signal, or through other compensatory behaviors (Houser and Moore, 2014). Masking can be tested directly in captive species (*e.g.,* Erbe, 2008), but in wild populations it must be either modeled or inferred from evidence of masking compensation. There are few studies addressing real-world masking sounds likely to be experienced by marine mammals in the wild (*e.g.,* Branstetter *et al.,* 2013).

Masking affects both senders and receivers of acoustic signals and can potentially have long-term chronic effects on marine mammals at the population level as well as at the individual level. Low-frequency ambient sound levels have increased by as much as 20 dB (more than three times in terms of SPL) in the world's ocean from pre-industrial periods, with most of the increase from distant commercial shipping (Hildebrand, 2009). All anthropogenic sound sources, but especially chronic and lower-frequency signals (*e.g.,* from vessel traffic), contribute to elevated ambient sound levels, thus intensifying masking.

The LRS WSEP training exercises proposed for the incidental take of marine mammals have the potential to take marine mammals by exposing them to impulsive noise and pressure waves generated by live ordnance detonation at the surface of the water. Exposure to energy, pressure, or direct strike by ordnance has the potential to result in non-lethal injury (Level A harassment), disturbance (Level B harassment), serious injury, and/or mortality. In addition, NMFS also considered the potential for harassment from vessel and aircraft operations.

Acoustic Effects, Underwater

Explosive detonations at the water surface send a shock wave and sound energy through the water and can release gaseous by-products, create an oscillating bubble, or cause a plume of water to shoot up from the water surface. The shock wave and accompanying noise are of most concern to marine animals. Depending on the intensity of the shock wave and size, location, and depth of the animal, an animal can be injured, killed, suffer non-lethal physical effects, experience hearing related effects with or without behavioral responses, or exhibit temporary behavioral responses or tolerance from hearing the blast sound. Generally, exposures to higher levels of impulse and pressure levels would result in greater impacts to an individual animal.

The effects of underwater detonations on marine mammals are dependent on several factors, including the size, type, and depth of the animal; the depth, intensity, and duration of the sound; the depth of the water column; the substrate of the habitat; the standoff distance between activities and the animal; and the sound propagation properties of the environment. Thus, we expect impacts to marine mammals from LRS WSEP activities to result primarily from acoustic pathways. As such, the degree of the effect relates to the received level and duration of the sound exposure, as influenced by the distance between the animal and the source. The further away from the source, the less intense the exposure should be.

The potential effects of underwater detonations from the proposed LRS WSEP training activities may include one or more of the following: temporary or permanent hearing impairment, non-auditory physical or physiological effects, behavioral disturbance, and masking (Richardson *et al.,* 1995; Gordon *et al.,* 2004; Nowacek *et al.,* 2007; Southall *et al.,* 2007). However, the effects of noise on marine mammals are highly variable, often depending on species and contextual factors (based on Richardson *et al.,* 1995).

In the absence of mitigation, impacts to marine species could result from physiological and behavioral responses to both the type and strength of the acoustic signature (Viada *et al.,* 2008). The type and severity of behavioral impacts are more difficult to define due to limited studies addressing the behavioral effects of impulsive sounds on marine mammals.

Hearing Impairment and Other Physical Effects—Marine mammals exposed to high intensity sound repeatedly or for prolonged periods can experience hearing threshold shift. Given the available data, the received level of a single pulse (with no frequency weighting) might need to be approximately 186 dB re 1 μPa2-s (*i.e.,* 186 dB sound exposure level (SEL) or approximately 221–226 dB p-p (peak)) in order to produce brief, mild TTS. Exposure to several strong pulses that each have received levels near 190 dB rms (175–180 dB SEL) might result in cumulative exposure of approximately 186 dB SEL and thus slight TTS in a small odontocete, assuming the TTS threshold is (to a first approximation) a function of the total received pulse energy.

Non-auditory Physiological Effects—Non-auditory physiological effects or injuries that theoretically might occur in marine mammals exposed to strong underwater sound include stress and other types of organ or tissue damage (Cox *et al.,* 2006; Southall *et al.,* 2007).

Serious Injury/Mortality: 86 FWS proposes to use surface detonations in its training exercises. The explosions from these weapons would send a shock wave and blast noise through the water, release gaseous by-products, create an oscillating bubble, and cause a plume of water to shoot up from the water surface. The shock wave and blast noise are of most concern to marine animals. In general, potential impacts from explosive detonations can range from brief effects (such as short term behavioral disturbance), tactile perception, physical discomfort, slight injury of the internal organs, and death of the animal (Yelverton *et al.,* 1973; O'Keeffe and Young, 1984; DoN, 2001). The effects of an underwater explosion on a marine mammal depend on many factors, including: the size, type, and depth of both the animal and the explosive charge; the depth of the water column; the standoff distance between the charge and the animal, and the sound propagation properties of the environment. Physical damage of tissues resulting from a shock wave (from an explosive detonation) constitutes an injury. Blast effects are greatest at the gas-liquid interface (Landsberg, 2000) and gas containing organs, particularly the lungs and gastrointestinal tract, are especially susceptible to damage (Goertner, 1982; Yelverton *et al.,* 1973). Nasal sacs, larynx, pharynx, trachea, and lungs may be damaged by compression/expansion caused by the oscillations of the blast gas bubble (Reidenberg and Laitman, 2003). Severe damage (from the shock wave) to the ears can include tympanic membrane rupture, fracture of the ossicles, cochlear damage, hemorrhage, and cerebrospinal fluid leakage into the middle ear.

Non-lethal injury includes slight injury to internal organs and the auditory system; however, delayed lethality can be a result of individual or cumulative sublethal injuries (DoN, 2001). Immediate lethal injury would be a result of massive combined trauma to internal organs as a direct result of proximity to the point of detonation (DoN, 2001).

Disturbance Reactions

Disturbance includes a variety of effects, including subtle changes in behavior, more conspicuous changes in activities, and displacement. Numerous studies have shown that underwater sounds are often readily detectable by marine mammals in the water at distances of many kilometers. However, other studies have shown that marine mammals at distances more than a few kilometers away often show no apparent response to activities of various types (Miller *et al.,* 2005). This is often true even in cases when the sounds must be readily audible to the animals based on measured received levels and the hearing sensitivity of that mammal group. Although various baleen whales, toothed whales, and (less frequently) pinnipeds have been shown to react behaviorally to underwater sound from impulsive sources such as airguns, at other times, mammals of all three types have shown no overt reactions (*e.g.,* Malme *et al.,* 1986; Richardson *et al.,* 1995; Madsen and Mohl, 2000; Croll *et al.,* 2001; Jacobs and Terhune, 2002; Madsen *et al.,* 2002; MacLean and Koski, 2005; Miller *et al.,* 2005; Bain and Williams, 2006).

Controlled experiments with captive marine mammals showed pronounced behavioral reactions, including avoidance of loud sound sources (Ridgway *et al.,* 1997; Finneran *et al.,* 2003). Observed responses of wild marine mammals to loud pulsed sound sources (typically seismic guns or acoustic harassment devices) have been varied but often consist of avoidance behavior or other behavioral changes suggesting discomfort (Morton and Symonds, 2002; Thorson and Reyff, 2006; see also Gordon *et al.,* 2004; Wartzok *et al.,* 2003; Nowacek *et al.,* 2007).

Because the few available studies show wide variation in response to underwater sound, it is difficult to quantify exactly how sound from the LRS WSEP operational testing would affect marine mammals. It is likely that the onset of surface detonations could result in temporary, short term changes in an animal's typical behavior and/or avoidance of the affected area. These behavioral changes may include (Richardson *et al.,* 1995): changing durations of surfacing and dives, number of blows per surfacing, or moving direction and/or speed; reduced/increased vocal activities; changing/cessation of certain behavioral activities (such as socializing or feeding); visible startle response or aggressive behavior (such as tail/fluke slapping or jaw clapping); or avoidance of areas where sound sources are located.

The biological significance of any of these behavioral disturbances is difficult to predict, especially if the detected disturbances appear minor. However generally, one could expect the consequences of behavioral modification to be biologically significant if the change affects growth, survival, or reproduction. Significant behavioral modifications that could potentially lead to effects on growth, survival, or reproduction include:

- Drastic changes in diving/surfacing patterns (such as those thought to cause beaked whale stranding due to exposure to military mid-frequency tactical sonar);
- Habitat abandonment due to loss of desirable acoustic environment; and
- Cessation of feeding or social interaction.

The onset of behavioral disturbance from anthropogenic sound depends on both external factors (characteristics of sound sources and their paths) and the specific characteristics of the receiving animals (hearing, motivation, experience, demography) and is difficult to predict (Southall *et al.,* 2007).

Auditory Masking

Natural and artificial sounds can disrupt behavior by masking, or interfering with, a marine mammal's ability to hear other sounds. Masking occurs when the receipt of a sound interferes with by another coincident sound at similar frequencies and at similar or higher levels (Clark *et al.,* 2009). While it may occur temporarily, we do not expect auditory masking to result in detrimental impacts to an individual's or population's survival, fitness, or reproductive success. Dolphin movement is not restricted within the BSURE area, allowing for movement out of the area to avoid masking impacts and the sound resulting from the detonations is short in duration. Also, masking is typically of greater concern for those marine mammals that utilize low frequency communications, such as baleen whales and, as such, is not likely to occur for marine mammals in the BSURE area.

Vessel and Aircraft Presence

The marine mammals most vulnerable to vessel strikes are slow-moving and/or spend extended periods of time at the surface in order to restore oxygen levels within their tissues after deep dives (*e.g.,* North Atlantic right whales (*Eubalaena glacialis*), fin whales, and sperm whales). Smaller marine mammals are agile and move more quickly through the water, making them less susceptible to ship strikes. NMFS and 86 FWS are not aware of any vessel strikes of dwarf and pygmy sperm whales within in BSURE area during training operations, and both parties do not anticipate that potential 86 FWS vessels engaged in the specified activity would strike any marine mammals.

Dolphins within Hawaiian waters are exposed to recreational, commercial, and military vessels. Behaviorally, marine mammals may or may not respond to the operation of vessels and associated noise. Responses to vessels vary widely among marine mammals in general, but also among different species of small cetaceans. Responses may include attraction to the vessel (Richardson *et al.,* 1995); altering travel patterns to avoid vessels (Constantine, 2001; Nowacek *et al.,* 2001; Lusseau, 2003, 2006); relocating to other areas (Allen and Read, 2000); cessation of feeding, resting, and social interaction (Baker *et al.,* 1983; Bauer and Herman, 1986; Hall, 1982; Krieger and Wing, 1984; Lusseau, 2003; Constantine *et al.,* 2004); abandoning feeding, resting, and nursing areas (Jurasz and Jurasz 1979; Dean *et al.,* 1985; Glockner-Ferrari and Ferrari, 1985, 1990; Lusseau, 2005; Norris *et al.,* 1985; Salden, 1988; Forest, 2001; Morton and Symonds, 2002; Courbis, 2004; Bejder, 2006); stress (Romano *et al.,* 2004); and changes in acoustic behavior (Van Parijs and Corkeron, 2001). However, in some studies marine mammals display no reaction to vessels (Watkins, 1986; Nowacek *et al.,* 2003) and many odontocetes show considerable tolerance to vessel traffic (Richardson *et al.,* 1995). Dolphins may actually reduce the energetic cost of traveling by riding the bow or stern waves of vessels (Williams *et al.,* 1992; Richardson *et al.,* 1995).

Aircraft produce noise at frequencies that are well within the frequency range of cetacean hearing and also produce visual signals such as the aircraft itself and its shadow (Richardson *et al.,* 1995, Richardson and Wursig, 1997). A major difference between aircraft noise and noise caused by other anthropogenic sources is that the sound is generated in the air, transmitted through the water surface and then propagates underwater to the receiver, diminishing the received levels significantly below what is heard above the water's surface. Sound transmission from air to water is greatest in a sound cone 26 degrees directly under the aircraft.

There are fewer reports of reactions of odontocetes to aircraft than those of pinnipeds. Responses to aircraft by pinnipeds include diving, slapping the water with pectoral fins or tail fluke, or swimming away from the track of the aircraft (Richardson *et al.,* 1995). The nature and degree of the response, or the lack thereof, are dependent upon the nature of the flight (*e.g.,* type of aircraft, altitude, straight vs. circular flight pattern). Wursig *et al.* (1998) assessed the responses of cetaceans to aerial surveys in the north central and western Gulf of Mexico using a DeHavilland Twin Otter fixed-wing airplane. The plane flew at an altitude of 229 m (751.3 ft) at 204 km/hr (126.7 mph) and maintained a minimum of 305 m (1,000 ft) straight line distance from the cetaceans. Water depth was 100 to 1,000 m (328 to 3,281 ft). Bottlenose dolphins most commonly responded by diving (48 percent), while 14 percent responded by moving away. Other species (*e.g.,* beluga (*Delphinapterus leucas*) and sperm whales) show considerable variation in reactions to aircraft but diving or swimming away from the aircraft are the most common reactions to low flights (less than 500 m; 1,640 ft).

Direct Strike by Ordnance

Another potential risk to marine mammals is direct strike by ordnance, in which the ordnance physically hits an animal. While strike from an item at the surface of the water while the animals is at the surface is possible, the potential risk of a direct hit to an animal within the target area would be so low because marine mammals spend the majority of their time below the surface of the water, and the potential for one bomb or missile to hit that animal at that specific time is highly unlikely since there are only a total of eight bombs on one day.

Anticipated Effects on Habitat

Detonations of live ordnance would result in temporary changes to the water environment. An explosion on the surface of the water from these weapons could send a shock wave and blast noise through the water, release gaseous by-products, create an oscillating bubble, and cause a plume of water to shoot up from the water surface. However, these effects would be temporary and not expected to last more than a few seconds. Similarly, 86 FWS does not expect any long-term impacts with regard to hazardous constituents to occur. 86 FWS considered the introduction of fuel, debris, ordnance, and chemical materials into the water column within its EA and determined the potential effects of each to be insignificant. We summarize 86 FWS's analyses in the following paragraphs (for a complete discussion of potential effects, please refer to section 3.0 in 86 FWS's EA).

Metals typically used to construct bombs and missiles include aluminum, steel, and lead, among others. Aluminum is also present in some explosive materials. These materials would settle to the seafloor after munitions detonate. Metal ions would slowly leach into the substrate and the water column, causing elevated concentrations in a small area around the munitions fragments. Some of the metals, such as aluminum, occur naturally in the ocean at varying concentrations and would not necessarily impact the substrate or water column. Other metals, such as lead, could cause toxicity in microbial communities in the substrate. However, such effects would be localized to a very small distance around munitions fragments and would not significantly affect the overall habitat quality of sediments in the BSURE area. In addition, metal fragments would corrode, degrade, and become encrusted over time.

Chemical materials include explosive byproducts and also fuel, oil, and other fluids associated with remotely controlled target boats. Explosive byproducts would be introduced into the water column through detonation of live munitions. Explosive materials would include 2,4,6-trinitrotoluene (TNT) and research department explosive (RDX), among others. Various byproducts are produced during and immediately after detonation of TNT and RDX. During the very brief time that a detonation is in progress, intermediate products may include carbon ions, nitrogen ions, oxygen ions, water, hydrogen cyanide, carbon monoxide, nitrogen gas, nitrous oxide, cyanic acid, and carbon dioxide (Becker, 1995). However, reactions quickly occur between the intermediates, and the final products consist mainly of water, carbon monoxide, carbon dioxide, and nitrogen gas, although small amounts of other compounds are typically produced as well.

Chemicals introduced into the water column would be quickly dispersed by waves, currents, and tidal action, and eventually become uniformly distributed. A portion of the carbon compounds such as carbon monoxide and carbon dioxide would likely become integrated into the carbonate system (alkalinity and pH buffering capacity of seawater). Some of the nitrogen and carbon compounds, including petroleum products, would be metabolized or assimilated by phytoplankton and bacteria. Most of the gas products that do not react with the water or become assimilated by organisms would be released into the atmosphere. Due to dilution, mixing, and transformation, none of these chemicals are expected to have significant impacts on the marine environment.

Explosive material that is not consumed in a detonation could sink to the substrate and bind to sediments. However, the quantity of such materials is expected to be inconsequential. Research has shown that if munitions function properly, nearly full combustion of the explosive materials will occur, and only extremely small amounts of raw material will remain. In addition, any remaining materials would be naturally degraded. TNT decomposes when exposed to sunlight (ultraviolet radiation), and is also degraded by microbial activity (Becker, 1995). Several types of microorganisms have been shown to metabolize TNT. Similarly, RDX decomposes by hydrolysis, ultraviolet radiation exposure, and biodegradation.

While we anticipate that the specified activity may result in marine mammals avoiding certain areas due to temporary ensonification, this impact to habitat and prey resources would be temporary and reversible. The main impact associated with the proposed activity would be temporarily elevated noise levels and the associated direct effects on marine mammals, previously discussed in this notice. Marine mammals are anticipated to temporarily vacate the area of live detonations. However, these events are usually of short duration, and animals are anticipated to return to the activity area during periods of non-activity. Thus, based on the preceding discussion, we do not anticipate that the proposed activity would have any habitat-related effects that could cause significant or long-term consequences for individual marine mammals or their populations.

Proposed Mitigation

In order to issue an incidental take authorization under section 101(a)(5)(D) of the MMPA, NMFS must set forth the permissible methods of taking pursuant to such activity, and other means of effecting the least practicable adverse impact on such species or stock and its habitat, paying particular attention to rookeries, mating grounds, and areas of similar significance, and the availability of such species or stock for taking for certain subsistence uses (where relevant).

The NDAA of 2004 amended the MMPA as it relates to military-readiness activities and the incidental take authorization process such that ''least practicable adverse impact'' shall include consideration of personnel safety, practicality of implementation, and impact on the effectiveness of the military readiness activity.

NMFS and 86 FWS have worked to identify potential practicable and effective mitigation measures, which include a careful balancing of the likely benefit of any particular measure to the marine mammals with the likely effect of that measure on personnel safety, practicality of implementation, and impact on the ''military-readiness activity.'' We refer the reader to Section 11 of 86 FWS's application for more detailed information on the proposed mitigation measures which include the following:

Visual Aerial Surveys: For the LRS WSEP activities, mitigation procedures consist of visual aerial surveys of the impact area for the presence of protected marine species (including marine mammals). During aerial observation, Navy test range personnel may survey the area from an S–61N helicopter or C–62 aircraft that is based at the PMRF land facility (typically when missions are located relatively close to shore). Alternatively, when missions are located farther offshore, surveys may be conducted from mission aircraft (typically jet aircraft such as F–15E, F–16, or F–22) or a U.S. Coast Guard C–130 aircraft.

Protected species surveys typically begin within one hour of weapon release and as close to the impact time as feasible, given human safety requirements. Survey personnel must depart the human hazard zone before weapon release, in accordance with Navy safety standards. Personnel conduct aerial surveys within an area defined by an approximately 2–NM (3,704 m) radius around the impact point, with surveys typically flown in a star pattern. This survey distance is consistent with requirements already in place for similar actions at PMRF and encompasses the entire TTS threshold ranges (SEL) for mid-frequency cetaceans (Table 5). For species in which potential exposures have been calculated (dwarf sperm whale and pygmy sperm whale), the survey distance would cover over half of the PTS SEL range. Given operational constraints, surveying these larger areas would not be feasible.

Observers would consist of aircrew operating the C–26, S–61N, and C–130 aircraft from PMRF and the Coast Guard. These aircrew are trained and experienced at conducting aerial marine mammal surveys and have provided similar support for other missions at PMRF. Aerial surveys are typically conducted at an altitude of about 200 feet, but altitude may vary somewhat depending on sea state and atmospheric conditions. If adverse weather conditions preclude the ability for aircraft to safely operate, missions would either be delayed until the weather clears or cancelled for the day. For 2016 Long Range Strike WSEP missions, one day has been designated as a weather back-up day. The C–26 and other aircraft would generally be operated at a slightly higher altitude than the helicopter. The observers will be provided with the GPS location of the impact area. Once the aircraft reaches the impact area, pre-mission surveys typically last for 30 minutes, depending on the survey pattern. The fixed-wing aircraft are faster than the helicopter; and, therefore, protected species may be more difficult to spot. However, to compensate for the difference in speed, the aircraft may fly the survey pattern multiple times.

If a protected species is observed in the impact area, weapon release would be delayed until one of the following conditions is met: (1) The animal is observed exiting the impact area; (2) the animal is thought to have exited the impact area based on its course and speed; or (3) the impact area has been clear of any additional sightings for a period of 30 minutes. All weapons will be tracked and their water entry points will be documented.

Post-mission surveys would begin immediately after the mission is complete and the Range Safety Officer declares the human safety area is reopened. Approximate transit time from the perimeter of the human safety area to the weapon impact area would depend on the size of the human safety area and vary between aircraft but is expected to be less than 30 minutes. Post-mission surveys would be conducted by the same aircraft and aircrew that conducted the pre-mission surveys and would follow the same patterns as pre-mission surveys but would focus on the area down current of the weapon impact area to determine if protected species were affected by the mission (observation of dead or injured animals). If an injury or mortality occurs to a protected species due to LRS WSEP missions, NMFS would be notified immediately.

A typical mission day would consist of pre-mission checks, safety review, crew briefings, weather checks, clearing airspace, range clearance, mitigations/monitoring efforts, and other military protocols prior to launch of weapons. Potential delays could be the result of multiple factors including, but not limited to, adverse weather conditions leading to unsafe take-off, landing, and aircraft operations, inability to clear the range of non-mission vessels or aircraft, mechanical issues with mission aircraft or munitions, or presence of protected species in the impact area. If the mission is cancelled due to any of these, one back-up day has also been scheduled as a contingency. These standard operating procedures are usually done in the morning, and live range time may begin in late morning once all checks are complete and approval is granted from range control. The range would be closed to the public for a maximum of four hours per mission day.

Determination of the Zone of Influence: The zone of influence is defined as the area or volume of ocean in which marine mammals could be exposed to various pressure or acoustic energy levels caused by exploding ordnance. Refer to Appendix A of the application for a description of the method used to calculate impact areas for explosives. The pressure and energy levels considered to be of concern are defined in terms of metrics, criteria, and thresholds. A metric is a technical standard of measurement that describes the acoustic environment (*e.g.,* frequency duration, temporal pattern, and amplitude) and pressure at a given location. Criteria are the resulting types of possible impact and include mortality, injury, and harassment. A threshold is the level of pressure or noise above which the impact criteria are reached.

Standard impulsive and acoustic metrics were used for the analysis of underwater energy and pressure waves in this document. Several different metrics are important for understanding risk assessment analysis of impacts to marine mammals: SPL is the ratio of the absolute sound pressure to a reference level, SEL is measure of sound intensity and duration, and positive impulse is the time integral of the pressure over the initial positive phase of an arrival.

The criteria and thresholds used to estimate potential pressure and acoustic impacts to marine mammals resulting from detonations were obtained from Finneran and Jenkins (2012) and include mortality, injurious harassment (Level A), and non-injurious harassment (Level B). In some cases, separate thresholds have been developed for different species groups or functional hearing groups. Functional hearing groups included in the analysis are low-frequency cetaceans, mid-frequency cetaceans, high-frequency cetaceans, and phocids.

Based on the ranges presented in Table 5 and factoring operational limitations associated with the mission, 86 FWS estimates that during pre-mission surveys, the proposed monitoring area would be approximately 2 km (3.7 miles) from the target area radius around the impact point, with surveys typically flown in a star pattern, which is consistent with requirements already in place for similar actions at PMRF and encompasses the entire TTS threshold ranges (SEL) for mid-frequency cetaceans. For species in which potential exposures have been calculated (dwarf sperm whale and pygmy sperm whale), the survey distance would cover over half of the PTS SEL range. Given operational constraints, surveying these larger areas would not be feasible.

Post-Mission Monitoring

Post-mission monitoring determines the effectiveness of pre-mission mitigation by reporting sightings of any marine mammals. Post-mission monitoring surveys will commence once the mission has ended or, if required, as soon as personnel declare the mission area safe. Post-mission monitoring will be identical to pre-mission surveys and will occur approximately 30 minutes after the munitions have been detonated, concentrating on the area down-current of the test site. Observers will document and report any marine mammal species, number, location, and behavior of any animals observed.

We have carefully evaluated 86 FWS's proposed mitigation measures in the context of ensuring that we prescribe the means of effecting the least practicable 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 measure is expected to minimize adverse impacts to marine mammals;
- The proven or likely efficacy of the specific measure to minimize adverse impacts as planned; and
- The practicability of the measure for applicant implementation.

Any mitigation measure(s) prescribed by NMFS should be able to accomplish, have a reasonable likelihood of accomplishing (based on current science), or contribute to the accomplishment of one or more of the general goals listed here:

1. Avoidance or minimization of injury or death of marine mammals wherever possible (goals 2, 3, and 4 may contribute to this goal).

2. A reduction in the numbers of marine mammals (total number or number at biologically important time or location) exposed to stimuli expected to result in incidental take (this goal may contribute to 1, above, or to reducing takes by behavioral harassment only).

3. A reduction in the number of times (total number or number at biologically important time or location) individuals would be exposed to stimuli that we expect to result in the take of marine mammals (this goal may contribute to 1, above, or to reducing harassment takes only).

4. A reduction in the intensity of exposures (either total number or number at biologically important time or location) to training exercises that we expect to result in the take of marine mammals (this goal may contribute to 1, above, or to reducing the severity of harassment takes only).

5. Avoidance or minimization of adverse effects to marine mammal habitat, paying special attention to the food base, activities that block or limit passage to or from biologically important areas, permanent destruction of habitat, or temporary destruction/disturbance of habitat during a biologically important time.

6. For monitoring directly related to mitigation—an increase in the probability of detecting marine mammals, thus allowing for more effective implementation of the mitigation.

Based on our evaluation of 86 FWS's proposed measures, as well as other measures that may be relevant to the specified activity, we have preliminarily determined that the proposed mitigation measures, including visual aerial surveys and mission delays if protected species are observed in the impact area, provide the means of effecting the least practicable impact on marine mammal 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 the impact of effectiveness of the military readiness activity).

Proposed Monitoring and Reporting

In order to issue an Authorization for an activity, section 101(a)(5)(D) of the MMPA states that we 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 an authorization must include the suggested means of accomplishing the necessary monitoring and reporting that will result in increased knowledge of the species and our expectations of the level of taking or impacts on populations of marine mammals present in the proposed action area.

86 FWS submitted marine mammal monitoring and reporting measures in their IHA application. We may modify or supplement these measures based on comments or new information received from the public during the public comment period. Any monitoring requirement we prescribe should improve our understanding of one or more of the following:

- Occurrence of marine mammal species in action area (*e.g.,* presence, abundance, distribution, density).
- Nature, scope, or context of likely marine mammal exposure to potential stressors/impacts (individual or cumulative, acute or chronic), through better understanding of: (1) Action or environment (*e.g.,* source characterization, propagation, ambient noise); (2) Affected species (*e.g.,* life history, dive patterns); (3) Co-occurrence of marine mammal species with the action; or (4) Biological or behavioral context of exposure (*e.g.,* age, calving or feeding areas).
- Individual responses to acute stressors, or impacts of chronic exposures (behavioral or physiological).
- How anticipated responses to stressors impact either: (1) Long-term fitness and survival of an individual; or (2) Population, species, or stock.
- Effects on marine mammal habitat and resultant impacts to marine mammals.
- Mitigation and monitoring effectiveness.

NMFS proposes to include the following measures in the LRS WSEP Authorization (if issued). They are:

(1) 86 FWS will track the use of the PMRF for missions and protected species observations, through the use of mission reporting forms.

(2) 86 FWS will submit a summary report of marine mammal observations and LRS WSEP activities to the NMFS Pacific Islands Regional Office (PIRO) and the Office of Protected Resources 90 days after expiration of the current Authorization. This report must include the following information: (i) Date and time of each LRS WSEP exercise; (ii) a complete description of the pre-exercise and post-exercise activities related to mitigating and monitoring the effects of LRS WSEP exercises on marine mammal populations; and (iii) results of the LRS WSEP exercise monitoring, including number of marine mammals (by species) that may have been harassed due to presence within the activity zone.

(3) 86 FWS will monitor for marine mammals in the proposed action area. If 86 FWS personnel observe or detect any dead or injured marine mammals prior to testing, or detects any injured or dead marine mammal during live fire exercises, 86 FWS must cease operations and submit a report to NMFS within 24 hours.

(4) 86 FWS must immediately report any unauthorized takes of marine mammals (*i.e.,* serious injury or mortality) to NMFS and to the respective Pacific Islands Region stranding network representative. 86 FWS must cease operations and submit a report to NMFS within 24 hours.

Estimated Numbers of Marine Mammals Taken by Harassment

The NDAA amended the definition of harassment as it applies to a ''military readiness activity'' to read as follows (Section 3(18)(B) of the MMPA): (i) Any act that injures or has the significant potential to injure a marine mammal or marine mammal stock in the wild [Level A Harassment]; or (ii) any act that disturbs or is likely to disturb a marine mammal or marine mammal stock in the wild by causing disruption of natural behavioral patterns, including, but not limited to, migration, surfacing, nursing, breeding, feeding, or sheltering, to a point where such behavioral patterns are abandoned or significantly altered [Level B Harassment].

NMFS' analysis identified the physiological responses, and behavioral responses that could potentially result from exposure to explosive detonations. In this section, we will relate the potential effects to marine mammals from detonation of explosives to the MMPA regulatory definitions of Level A and Level B harassment. This section will also quantify the effects that might occur from the proposed military readiness activities in PMRF BSURE area.

86 FWS thresholds used for onset of temporary threshold shift (TTS; Level B Harassment) and onset of permanent threshold shift (PTS; Level A Harassment) are consistent with the thresholds outlined in the Navy's report titled, ''Criteria and Thresholds for U.S. Navy Acoustic and Explosive Effects Analysis Technical Report,'' which the Navy coordinated with NMFS. NMFS believes that the thresholds outlined in the Navy's report represent the best available science. The report is available on the internet at: *http://nwtteis.com/Portals/NWTT/DraftEIS2014/SupportingDocs/NWTT_NMSDD_Technical_Report_23_January%202014_reduced.pdf.*

Level B Harassment

Of the potential effects described earlier in this document, the following are the types of effects that fall into the Level B harassment category:

Behavioral Harassment—Behavioral disturbance that rises to the level described in the above definition, when resulting from exposures to non-impulsive or impulsive sound, is Level B harassment. Some of the lower level physiological stress responses 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. When predicting Level B harassment based on estimated behavioral responses, those takes may have a stress-related physiological component.

Temporary Threshold Shift—As discussed previously, TTS can affect how an animal behaves in response to the environment, including conspecifics, predators, and prey. NMFS classifies TTS (when resulting from exposure to explosives and other impulsive sources) as Level B harassment, not Level A harassment (injury).

Level A Harassment

Of the potential effects that were described earlier, the following are the types of effects that fall into the Level A Harassment category:

Permanent Threshold Shift—PTS (resulting from exposure to explosive detonations) is irreversible and NMFS considers this to be an injury.

Table 4 outlines the explosive thresholds used by NMFS for this Authorization when addressing noise impacts from explosives.

Table 4. Explosive thresholds for Marine Mammals used by 86 FWS in its current acoustics impacts modeling.

Functional Hearing Group	Mortality*	Level A Harassment			Level B Harassment	
		Slight Lung Injury*	GI Tract Injury	PTS	TTS	Behavioral
LF Cetaceans	$91.4M^{1/3}\left(1+\frac{D}{10.1}\right)^{1/2}$	$39.1M^{1/3}\left(1+\frac{D}{10.1}\right)^{1/2}$	Unweighted SPL: 237 dB re 1 μPa	Weighted SEL: 187 dB re 1 $\mu Pa^2 \cdot s$	Weighted SEL: 172 dB re 1 $\mu Pa^2 \cdot s$	Weighted SEL: 167 dB re 1 $\mu Pa^2 \cdot s$
				Unweighted SPL: 230 dB re 1 μPa	Unweighted SPL: 224 dB re 1 μPa (23 psi PP)	
MF Cetaceans			Unweighted SPL: 237 dB re 1 μPa	Weighted SEL: 187 dB re 1 $\mu Pa^2 \cdot s$	Weighted SEL: 172 dB re 1 $\mu Pa^2 \cdot s$	Weighted SEL: 167 dB re 1 $\mu Pa^2 \cdot s$
				Unweighted SPL: 230 dB re 1 μPa	Unweighted SPL: 224 dB re 1 μPa (23 psi PP)	
HF Cetaceans			Unweighted SPL: 237 dB re 1 μPa	Weighted SEL: 161 dB re 1 $\mu Pa^2 \cdot s$	Weighted SEL: 146 dB re 1 $\mu Pa^2 \cdot s$	Weighted SEL: 141 dB re 1 $\mu Pa^2 \cdot s$
				Unweighted SPL: 201 dB re 1 μPa	Unweighted SPL: 195 dB re 1 μPa (1 psi PP)	
Phocids (in water)			Unweighted SPL: 237 dB re 1 μPa	Weighted SEL: 192 dB re 1 $\mu Pa^2 \cdot s$	Weighted SEL: 177 dB re 1 $\mu Pa^2 \cdot s$	Weighted SEL: 172 dB re 1 $\mu Pa^2 \cdot s$
				Unweighted SPL: 218 dB re 1 μPa	Unweighted SPL: 212 dB re 1 μPa (6 psi PP)	

M = Animal mass based on species (kilograms); *D* = Water depth (meters); dB re 1 μPa = decibels referenced to 1 microPascal; dB re 1 $\mu Pa^2 \cdot s$ = decibels reference to 1 microPascal-squared–seconds; GI = gastrointestinal; PTS = permanent threshold shift; SEL = sound exposure level; TTS = temporary threshold shift; SPL = sound pressure level; PP = peak pressure

*Expressed in terms of acoustic impulse (Pascal – seconds [Pa·s])

86 FWS completed acoustic modeling to determine the distances to NMFS's explosive thresholds from their explosive ordnance, which was then used with each species' density to determine number of exposure estimates. Below is a summary of those modeling efforts.

The maximum estimated range, or radius, from the detonation point to which the various thresholds extend for all munitions proposed to be released in a 24-hour time period was calculated based on explosive acoustic characteristics, sound propagation, and sound transmission loss in the Study Area, which incorporates water depth, sediment type, wind speed, bathymetry, and temperature/salinity profiles (Table 5). The ranges were used to calculate the total area (circle) of the zones of influence for each criterion/threshold. To eliminate ''double-counting'' of animals, impact areas from higher impact categories (*e.g.,* mortality) were subtracted from areas associated with lower impact categories (*e.g.,* Level A harassment). The estimated number of marine mammals potentially exposed to the various impact thresholds was then calculated as the product of the adjusted impact area, scaled animal density, and number of events. Since the model accumulates the energy from all detonations within a 24-hour timeframe, it is assumed that the same population of animals is being impacted within that time period. The population would refresh after 24 hours. In this case, only one mission day is planned for 2016, and therefore, only one event is modeled that would impact the same population of animals. Details of the acoustic modeling method are provided in Appendix A of the application.

The resulting total number of marine mammals potentially exposed to the various levels of thresholds is shown in Table 7. An animal is considered ''exposed'' to a sound if the received sound level at the animal's location is above the background ambient acoustic level within a similar frequency band. The exposure calculations from the model output resulted in decimal values, suggesting in most cases that a fraction of an animal was exposed. To eliminate this, the acoustic model results were rounded to the nearest whole animal to obtain the exposure estimates from 2016 missions. Furthermore, to eliminate ''double-counting'' of animals, exposure results from higher impact categories (*e.g.,* mortality) were subtracted from lower impact categories (*e.g.,* Level A harassment). For impact categories with multiple criteria and/or thresholds (*e.g.,* three criteria and four thresholds associated with Level A harassment), numbers in the table are based on the threshold resulting in the greatest number of exposures. These exposure estimates do not take into account the required mitigation and monitoring measures, which may decrease the potential for impacts.

TABLE 5—DISTANCES (m) TO EXPLOSIVE THRESHOLDS FROM 86 FWS'S EXPLOSIVE ORDNANCE

Species	Mortality [1]	Level A Harassment [2]				Level B Harassment		
		Slight lung injury	GI tract injury	PTS		TTS	Behavioral	
			237 dB SPL	Applicable SEL*	Applicable SPL*	Applicable SEL*	Applicable SPL*	Applicable SEL*
Humpback Whale	38	81	165	2,161	330	6,565	597	13,163
Blue Whale	28	59	165	2,161	330	6,565	597	13,163
Fin Whale	28	62	165	2,161	330	6,565	597	13,163
Sei Whale	38	83	165	2,161	330	6,565	597	13,163
Bryde's Whale	38	81	165	2,161	330	6,565	597	13,163
Minke Whale	55	118	165	2,161	330	6,565	597	13,163
Sperm Whale	33	72	165	753	330	3,198	597	4,206
Pygmy Sperm Whale	105	206	165	6,565	3,450	20,570	6,565	57,109
Dwarf Sperm Whale	121	232	165	6,565	3,450	20,570	6,565	57,109
Killer Whale	59	126	165	753	330	3,198	597	4,206
False Killer Whale	72	153	165	753	330	3,198	597	4,206
Pygmy Killer Whale	147	277	165	753	330	3,198	597	4,206
Short-finned Pilot Whale	91	186	165	753	330	3,198	597	4,206
Melon-headed Whale	121	228	165	753	330	3,198	597	4,206
Bottlenose Dolphin	121	232	165	753	330	3,198	597	4,206
Pantropical Spotted Dolphin	147	277	165	753	330	3,198	597	4,206
Striped Dolphin	147	277	165	753	330	3,198	597	4,206
Spinner Dolphin	147	277	165	753	330	3,198	597	4,206
Rough-toothed Dolphin	121	232	165	753	330	3,198	597	4,206
Fraser's Dolphin	110	216	165	753	330	3,198	597	4,206
Risso's Dolphin	85	175	165	753	330	3,198	597	4,206
Cuvier's Beaked Whale	51	110	165	753	330	3,198	597	4,206
Blainville's Beaked Whale	79	166	165	753	330	3,198	597	4,206
Longman's Beaked Whale	52	113	165	753	330	3,198	597	4,206
Hawaiian Monk Seal	135	256	165	1,452	1,107	3,871	1,881	6,565

[1] Based on Goertner (1982).
[2] Based on Richmond *et al.* (1973).
*Based on the applicable Functional Hearing Group.

Density Estimation

Density estimates for marine mammals were derived from the Navy's 2014 Marine Species Density Database (NMSDD). NMFS refers the reader to Section 3 of 86 FWS's application for detailed information on all equations used to calculate densities presented in Table 6.

TABLE 6—MARINE MAMMAL DENSITY ESTIMATES WITHIN 86 FWS'S PMRF

Species	Density (animals/km^2)
Dwarf sperm whale	0.00714
Pygmy sperm whale	0.00291

Take Estimation

Table 7 indicates the modeled potential for lethality, injury, and non-injurious harassment (including behavioral harassment) to marine mammals in the absence of mitigation measures. 86 FWS and NMFS estimate that one marine mammal species could be exposed to injurious Level A harassment noise levels (187 dB SEL) and two species could be exposed to Level B harassment (TTS and Behavioral) noise levels in the absence of mitigation measures.

TABLE 7—MODELED NUMBER OF MARINE MAMMALS POTENTIALLY AFFECTED BY LRS WSEP OPERATIONS

Species	Mortality	Level A harassment (PTS only)	Level B harassment (TTS)	Level B harassment (behavioral)
Dwarf sperm whale	0	1	9	64
Pygmy sperm whale	0	0	3	26
TOTAL	0	1	12	90

Based on the mortality exposure estimates calculated by the acoustic model, zero marine mammals are expected to be affected by pressure levels associated with mortality or serious injury. Zero marine mammals are expected to be exposed to pressure levels associated with slight lung injury or gastrointestinal tract injury.

NMFS generally considers PTS to fall under the injury category (Level A Harassment). An animal would need to stay very close to the sound source for an extended amount of time to incur a serious degree of PTS, which could increase the probability of mortality. In this case, it would be highly unlikely for this scenario to unfold given the nature of any anticipated acoustic exposures that could potentially result from a mobile marine mammal that NMFS generally expects to exhibit avoidance behavior to loud sounds within the BSURE area.

NMFS has relied on the best available scientific information to support the issuance of 86 FWS's authorization. In the case of authorizing Level A harassment, NMFS has estimated that one dwarf sperm whale could, although unlikely, experience minor permanent threshold shifts of hearing sensitivity (PTS). The available data and analyses, as described more fully in this notice include extrapolation results of many studies on marine mammal noise-induced temporary threshold shifts of hearing sensitivities. An extensive review of TTS studies and experiments prompted NMFS to conclude that possibility of minor PTS in the form of slight upward shift of hearing threshold at certain frequency bands by one individual marine mammal is extremely low, but not unlikely.

Negligible Impact Analysis and Preliminary Determinations

NMFS has defined ''negligible impact'' in 50 CFR 216.103 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.'' 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 Level B harassment 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 behavioral harassment, we consider 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 the number and nature of estimated Level A harassment takes, the number of estimated mortalities, and effects on habitat.

To avoid repetition, the discussion below applies to all the species listed in Table 7 for which we propose to authorize incidental take for 86 FWS's activities.

In making a negligible impact determination, we consider:

- The number of anticipated injuries, serious injuries, or mortalities;
- The number, nature, and intensity, and duration of Level B harassment;
- The context in which the takes occur (*e.g.,* impacts to areas of significance, impacts to local populations, and cumulative impacts when taking into account successive/contemporaneous actions when added to baseline data);
- The status of stock or species of marine mammals (*i.e.,* depleted, not depleted, decreasing, increasing, stable, impact relative to the size of the population);
- Impacts on habitat affecting rates of recruitment/survival; and
- The effectiveness of monitoring and mitigation measures to reduce the number or severity of incidental take.

For reasons stated previously in this document and based on the following factors, 86 FWS's specified activities are not likely to cause long-term behavioral disturbance, serious injury, or death.

The takes from Level B harassment would be due to potential behavioral disturbance and TTS. The takes from Level A harassment would be due to potential PTS. Activities would only occur over a timeframe of one day in September, 2016.

Noise-induced threshold shifts (TS, which includes PTS) are defined as increases in the threshold of audibility (*i.e.,* the sound has to be louder to be detected) of the ear at a certain frequency or range of frequencies (ANSI 1995; Yost 2007). Several important factors relate to the magnitude of TS, such as level, duration, spectral content (frequency range), and temporal pattern (continuous, intermittent) of exposure (Yost 2007; Henderson *et al.,* 2008). TS occurs in terms of frequency range (Hz or kHz), hearing threshold level (dB), or both frequency and hearing threshold level.

In addition, there are different degrees of PTS: Ranging from slight/mild to moderate and from severe to profound. Profound PTS or the complete loss of the ability to hear in one or both ears is commonly referred to as deafness. High-frequency PTS, presumably as a normal process of aging that occurs in humans and other terrestrial mammals, has also been demonstrated in captive cetaceans (Ridgway and Carder, 1997; Yuen *et al.* 2005; Finneran *et al.,* 2005; Houser and Finneran, 2006; Finneran *et al.,* 2007; Schlundt *et al.,* 2011) and in stranded individuals (Mann *et al.,* 2010).

In terms of what is analyzed for the potential PTS (Level A harassment) in one marine mammal as a result of 86 FWS's LRS WSEP operations, if it occurs, NMFS has determined that the levels would be slight/mild because research shows that most cetaceans show relatively high levels of avoidance. Further, it is uncommon to sight marine mammals within the target area, especially for prolonged durations. Avoidance varies among individuals and depends on their activities or reasons for being in the area.

NMFS' predicted estimates for Level A harassment take (Table 7) are likely overestimates of the likely injury that will occur. NMFS expects that successful implementation of the required aerial-based mitigation measures could avoid Level A take. Also, NMFS expects that some individuals would avoid the source at levels expected to result in injury. Nonetheless, although NMFS expects that Level A harassment is unlikely to occur at the numbers proposed to be authorized, because it is difficult to quantify the degree to which the mitigation and avoidance will reduce the number of animals that might incur PTS, we are proposing to authorize (and analyze) the modeled number of Level A takes (one), which does not take the mitigation or avoidance into consideration. However, we anticipate that any PTS incurred because of mitigation and the likely short duration of exposures, would be in the form of only a small degree of permanent threshold shift and not total deafness.

While animals may be impacted in the immediate vicinity of the activity, because of the short duration of the actual individual explosions themselves (versus continual sound source operation) combined with the short duration of the LRS WSEP operations, NMFS has preliminarily determined that there will not be a substantial impact on marine mammals or on the normal functioning of the nearshore or offshore waters off Kauai and its ecosystems. We do not expect that the proposed activity would impact rates of recruitment or survival of marine mammals since we do not expect mortality (which would remove individuals from the population) or serious injury to occur. In addition, the proposed activity would not occur in areas (and/or times) of significance for the marine mammal populations potentially affected by the exercises (*e.g.,* feeding or resting areas, reproductive areas), and the activities would only occur in a small part of their overall range, so the impact of any potential temporary displacement would be negligible and animals would be expected to return to the area after the cessations of activities. Although the proposed activity could result in Level A (PTS only, not slight lung injury or gastrointestinal tract injury) and Level B (behavioral disturbance and TTS) harassment of marine mammals, the level of harassment is not anticipated to impact rates of recruitment or survival of marine mammals because the number of exposed animals is expected to be low due to the short-term (*i.e.,* four hours a day or less on one day) and site-specific nature of the activity. We do not anticipate that the effects would be detrimental to rates of recruitment and survival because we do not expect serious of extended behavioral responses that would result in energetic effects at the level to impact fitness.

Moreover, the mitigation and monitoring measures proposed for the IHA (described earlier in this document) are expected to further minimize the potential for harassment. The protected species surveys would require 86 FWS to search the area for marine mammals, and if any are found in the impact zone, then the exercise would be suspended until the animal(s) has left the area or relocated outside of the zone. Furthermore, LRS WSEP missions may be delayed or rescheduled for adverse weather conditions.

Based on the preliminary 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 mitigation and monitoring measures, NMFS finds that 86 FWS's LRS WSEP operations will result in the incidental take of marine mammals, by Level A and Level B harassment only, and that the taking from the LRS WSEP exercises will have a negligible impact on the affected species or stocks.

Impact on Availability of Affected Species or Stock for Taking for Subsistence Uses

There are no relevant subsistence uses of marine mammals implicated by this action. Therefore, NMFS has preliminarily determined that the total taking of affected 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 (ESA)

No marine mammal species listed under the ESA are expected to be affected by these activities. Therefore, NMFS has determined that a section 7 consultation under the ESA is not required.

National Environmental Policy Act (NEPA)

In 2015, 86 FWS provided NMFS with an EA titled, Environmental Assessment/Overseas Environmental Assessment for the Long Range Strick Weapon Systems Evaluation Program Operational Evaluations. The EA analyzed the direct, indirect, and cumulative environmental impacts of the specified activities on marine mammals. NMFS will review and evaluate the 86 FWS EA for consistency with the regulations published by the Council of Environmental Quality (CEQ) and NOAA Administrative Order 216–6, Environmental Review Procedures for Implementing the National Environmental Policy Act, and determine whether or not to adopt it. Information in 86 FWS's application, EA, and this notice collectively provide the environmental information related to proposed issuance of the IHA for public review and comment. We will review all comments submitted in response to this notice as we complete the NEPA process, including decision of whether to sign a Finding of No Significant Impact (FONSI), prior to a final decision on the IHA request. The 2016 NEPA documents are available for review at *www.nmfs.noaa.gov/pr/permits/incidental/military.html.*

Proposed Authorization

As a result of these preliminary determinations, we propose to issue an IHA to 86 FWS for conducting LRS WSEP activities, for a period of one year from the date of issuance, provided the previously mentioned mitigation, monitoring, and reporting requirements are incorporated. The proposed Authorization language is provided in the next section. The wording contained in this section is proposed for inclusion in the Authorization (if issued).

1. This Authorization is valid for a period of one year from the date of issuance.

2. This Authorization is valid only for activities associated with the LRS WSEP operations utilizing munitions identified in the Attachment.

3. The incidental taking, by Level A and Level B harassment, is limited to: Dwarf sperm whale (*Kogia sima*) and Pygmy sperm whale (*Kogia breviceps*) as specified in Table 1 of this notice.

TABLE 1—AUTHORIZED TAKE NUMBERS.

Species	Level A takes	Level B takes
Dwarf sperm whale	1	73
Pygmy sperm whale	0	29
Total	1	102

The taking by serious injury or death of these species, the taking of these species in violation of the conditions of this Incidental Harassment Authorization, or the taking by harassment, serious injury or death of any other species of marine mammal is prohibited and may result in the modification, suspension or revocation of this Authorization.

4. Mitigation

When conducting this activity, the following mitigation measures must be undertaken:

- If daytime weather and/or sea conditions preclude adequate monitoring for detecting marine mammals and other marine life, LRS WSEP strike operations must be delayed until adequate sea conditions exist for monitoring to be undertaken.
- On the morning of the LRS WSEP strike mission, the test director and safety officer will confirm that there are no issues that would preclude mission execution and that the weather is adequate to support monitoring and mitigation measures.
- If post-mission surveys determine that an injury or lethal take of a marine mammal has occurred, the next mission will be suspended until the test procedure and the monitoring methods have been reviewed with NMFS and appropriate changes made.

5. Monitoring

The holder of this Authorization is required to cooperate with the National Marine Fisheries Service and any other Federal, state or local agency monitoring the impacts of the activity on marine mammals.

The holder of this Authorization will track their use of the PMRF BSURE area for the LRS WSEP missions and marine mammal observations, through the use of mission reporting forms.

Aerial surveys: Pre- and post- mission will be conducted. Pre-mission surveys would begin approximately one hour prior to detonation. Post-detonation monitoring surveys will commence once the mission has ended or, if required, as soon as personnel declare the mission area safe.

Proposed monitoring area would be approximately 2 km (3.7 miles) from the target area radius around the impact point, with surveys typically flown in a star pattern. Aerial surveys would be conducted at an altitude of about 200 feet, but altitude may vary somewhat depending on sea state and atmospheric conditions. If adverse weather conditions preclude the ability for aircraft to safely operate, missions would either be delayed until the weather clears or cancelled for the day. The observers will be provided with the GPS location of the impact area. Once the aircraft reaches the impact area, pre-mission surveys typically last for 30 minutes, depending on the survey pattern. The aircraft may fly the survey pattern multiple times.

6. Reporting

The holder of this Authorization is required to:

(a) Submit a draft report on all monitoring conducted under the IHA within 90 days of the completion of marine mammal monitoring, or 60 days prior to the issuance of any subsequent IHA for projects at PMRF, whichever comes first. A final report shall be prepared and submitted within 30 days following resolution of comments on the draft report from NMFS. This report must contain the informational elements described in the Monitoring Plan, at minimum (see *www.nmfs.noaa.gov/pr/permits/incidental/construction.htm*), and shall also include:

1. Date and time of each LRS WSEP mission;

2. A complete description of the pre-exercise and post-exercise activities related to mitigating and monitoring the effects of LRS WSEP missions on marine mammal populations; and

3. Results of the monitoring program, including numbers by species/stock of any marine mammals noted injured or killed as a result of the LRS WSEP mission and number of marine mammals (by species if possible) that may have been harassed due to presence within the zone of influence.

The draft report will be subject to review and comment by the National Marine Fisheries Service. Any recommendations made by the National Marine Fisheries Service must be addressed in the final report prior to acceptance by the National Marine Fisheries Service. The draft report will be considered the final report for this activity under this Authorization if the National Marine Fisheries Service has not provided comments and recommendations within 90 days of receipt of the draft report.

(b) Reporting injured or dead marine mammals:

i. In the unanticipated event that the specified activity clearly causes the take of a marine mammal in a manner prohibited by this IHA, such as an injury for species not authorized (Level A harassment), serious injury, or mortality, 86 FWS shall immediately cease the specified activities and report the incident to the Office of Protected Resources, NMFS, and the Pacific Islands Regional Stranding Coordinator, NMFS. The report must include the following information:

A. Time and date of the incident;

B. Description of the incident;

C. Environmental conditions (*e.g.,* wind speed and direction, Beaufort sea state, cloud cover, and visibility);

D. Description of all marine mammal observations in the 24 hours preceding the incident;

E. Species identification or description of the animal(s) involved;

F. Fate of the animal(s); and

G. Photographs or video footage of the animal(s).

Activities shall not resume until NMFS is able to review the circumstances of the prohibited take. NMFS will work with 86 FWS to determine what measures are necessary to minimize the likelihood of further prohibited take and ensure MMPA compliance. 86 FWS may not resume their activities until notified by NMFS.

ii. In the event that 86 FWS discovers an injured or dead marine mammal, and the lead observer determines that the cause of the injury or death is unknown and the death is relatively recent (*e.g.,* in less than a moderate state of decomposition), 86 FWS shall immediately report the incident to the Office of Protected Resources, NMFS, and the Pacific Islands Regional Stranding Coordinator, NMFS.

The report must include the same information identified in 6(b)(i) of this IHA. Activities may continue while NMFS reviews the circumstances of the incident. NMFS will work with 86 FWS to determine whether additional mitigation measures or modifications to the activities are appropriate.

iii. In the event that 86 FWS discovers an injured or dead marine mammal, and the lead observer determines that the injury or death is not associated with or related to the activities authorized in the IHA (*e.g.,* previously wounded animal, carcass with moderate to advanced decomposition, scavenger damage), 86 FWS shall report the incident to the Office of Protected Resources, NMFS, and the Pacific Islands Regional Stranding Coordinator, NMFS, within 24 hours of the discovery. 86 FWS shall provide photographs or video footage or other documentation of the stranded animal sighting to NMFS.

7. Additional Conditions

- The holder of this Authorization must inform the Director, Office of Protected Resources, National Marine Fisheries Service, (301–427–8400) or designee (301–427–8401) prior to the initiation of any changes to the monitoring plan for a specified mission activity.
- A copy of this Authorization must be in the possession of the safety officer on duty each day that long range strike missions are conducted.
- This Authorization may be modified, suspended or withdrawn if the holder fails to abide by the conditions prescribed herein, or if NMFS determines the authorized taking is having more than a negligible impact on the species or stock of affected marine mammals.

Request for Public Comments

We request comment on our analysis, the draft authorization, and any other aspect of this **Federal Register** notice of proposed Authorization. Please include with your comments any supporting data or literature citations to help inform our final decision on 86 FWS's renewal request for an MMPA authorization.

Dated: July 1, 2016.

Donna S. Wieting,

Director, Office of Protected Resources, National Marine Fisheries Service.

[FR Doc. 2016–16114 Filed 7–6–16; 8:45 am]

BILLING CODE 3510–22–P

DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

RIN 0648–XE461

Marine Mammals; Pinniped Removal Authority; Approval of Application

AGENCY: National Marine Fisheries Service (NMFS), National Oceanic and Atmospheric Administration, Commerce (NOAA).

ACTION: Notice of availability.

SUMMARY: NMFS announces approval of an application for a Letter of Authorization (LOA) from the states of Oregon, Washington, and Idaho for lethal removal of individually identifiable predatory California sea lions (*Zalophus californianus*) in the vicinity of Bonneville Dam to minimize pinniped predation on Pacific salmon and steelhead (*Oncorhynchus spp.)* listed as threatened or endangered under the Endangered Species Act (ESA) in the Columbia River in Washington and Oregon. This authorization is pursuant to the Marine Mammal Protection Act (MMPA). NMFS also announces availability of decision documents and other information relied upon in making this determination.

ADDRESSES: Additional information about our determination may be obtained by visiting the NMFS West Coast Region's Web site: *http://www.westcoast.fisheries.noaa.gov,* or by writing to us at: NMFS West Coast Region, Protected Resources Division, 1201 Lloyd Blvd., Suite 1100, Portland, OR 97232.

FOR FURTHER INFORMATION CONTACT: Mr. Robert Anderson at the above address, by phone at (503) 231–2226, or by email at *robert.c.anderson@noa.gov.*

SUPPLEMENTARY INFORMATION: