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DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

50 CFR Part 218

[Docket No. 140109018-5999-02]

RIN 0648-BD89

Takes of Marine Mammals Incidental to Specified Activities; U.S. Navy Training and Testing Activities in the Northwest Training and Testing Study Area

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

ACTION: Final rule.

SUMMARY: Upon application from the U.S. Navy (Navy), we (the National Marine Fisheries Service) are issuing regulations under the Marine Mammal Protection Act (MMPA) to govern the unintentional taking of marine mammals incidental to training and testing activities conducted in the Northwest Training and Testing (NWTT) Study Area from November 2015 through November 2020. These regulations allow us to issue Letters of Authorization (LOAs) for the incidental take of marine mammals during the Navy's specified activities and timeframes, set forth the permissible methods of taking, set forth other means of effecting the least practicable adverse impact on marine mammal species or stocks and their habitat, and set forth requirements pertaining to the monitoring and reporting of the incidental take. These regulations also allow us to authorize modifications to watchstander requirements for observed behavior of marine mammals during Major Training Events (MTEs) in the Hawaii-Southern California Training and

Testing (HSTT), Atlantic Fleet Training and Testing (AFTT), Mariana Islands Training and Testing (MITT), and Gulf of Alaska Training (GOA) study areas. Modifications to the Navy watchstander requirements include a revision to regulatory text in current regulations governing the taking and importing of marine mammals during training and/or testing activities in these study areas. There are no MTEs associated with Navy training and testing activities in the NWTT Study Area.

DATES: Effective November 9, 2015, through November 8, 2020.

ADDRESSES: To obtain an electronic copy of the Navy's application or other referenced documents, visit the internet at: *http://www.nmfs.noaa.gov/pr/permits/incidental/military.htm*. Documents cited in this notice may also be viewed, by appointment, during regular business hours, at 1315 East-West Highway, SSMC III, Silver Spring MD 20912.

FOR FURTHER INFORMATION CONTACT: John Fiorentino, Office of Protected Resources, NMFS, (301) 427-8477.

SUPPLEMENTARY INFORMATION:

Availability

A copy of the Navy's LOA application, which contains a list of the references used in this document, may be obtained by visiting the internet at: *http://www.nmfs.noaa.gov/pr/permits/incidental/military.htm*. The Navy's Final Environmental Impact Statement/Overseas Environmental Impact Statement (FEIS/OEIS) for the NWTT Study Area, which also contains a list of the references used in this document, may be viewed at *http://www.nwtteis.com*. Documents cited in this

notice may also be viewed, by appointment, during regular business hours, at the aforementioned address (see **ADDRESSES**).

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 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.

Authorization for incidental takings 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 takings 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 National Defense Authorization Act of 2004 (NDAA) (Public Law 108-136) removed the "small numbers" and "specified geographical region" limitations indicated above 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 December 19, 2013, NMFS received an application (version (v)1 dated December 18, 2013) from the Navy requesting two LOAs for the take of 25 species of marine mammals incidental to Navy training and testing activities to be conducted in the NWTT Study Area over 5 years. On October 1, 2014, the Navy submitted a revised LOA application (v2 dated September 26, 2014) to reflect updates to exposure estimates based on emergent changes to specific types of training activities which were addressed in the Navy's supplemental EIS/OEIS for the NWTT Study Area. The revised application also provided an update to the effects analysis for Guadalupe fur seals (summarized in the Analysis of Guadalupe Fur Seal Exposures section of this proposed rule) to more realistically reflect potential impacts from offshore Navy training and testing events. On November 7, 2014, the Navy submitted a revised LOA application (v3 dated November 7, 2014) to address: a) an inadvertent error in the recommended mitigation zone for mine countermeasure and neutralization training events; b) removal of the time delay firing underwater explosive training activity; c) correction or clarification of certain mitigation measures applied to testing, and d) revised mitigation for pinniped haulouts. On November 21, 2014, the Navy submitted a revised LOA application (v4 dated November 7, 2014) to correct inadvertent errors in the exposure calculations. On April 2, 2015, the Navy submitted a final revision to the LOA application (v5 dated April 2, 2015)

(hereinafter referred to as the LOA application) to incorporate and update population density estimates for the Hood Canal stock of harbor seals and remove the ship strike mortality request.

The Navy is requesting separate 5-year LOAs for training and testing activities to be conducted from 2015 through 2020. The NWTT Study Area is composed of established maritime operating and warning areas in the eastern north Pacific Ocean region, to include the Strait of Juan de Fuca, Puget Sound, and Western Behm Canal in southeastern Alaska. The Study Area includes the existing Northwest Training Range Complex, the Keyport Range Complex, Carr Inlet Operations Area, Southeast Alaska Acoustic Measurement Facility (SEAFAC), and Navy pierside locations where sonar maintenance or testing may occur (see Figure 1-1 of the LOA application for a map of the NWTT Study Area). The activities conducted within the NWTT Study Area are classified as military readiness activities. The Navy states that these activities may expose some of the marine mammals present within the NWTT Study Area to sound from underwater acoustic sources and explosives. The Navy is requesting authorization to take 25 marine mammal species by Level B (behavioral) harassment; 5 of those marine mammal species may be taken by injury (Level A harassment). The Navy is not requesting mortality takes for any species.

The Navy's LOA application and the NWTT FEIS/OEIS contain acoustic thresholds that, in some instances, represent changes from what NMFS has used to evaluate the Navy's activities for previous authorizations. The revised thresholds, which the Navy developed in coordination with NMFS, are based on the evaluation and inclusion of new information from recent scientific studies; a detailed explanation of how

they were derived is provided in the NWTT FEIS/OEIS Criteria and Thresholds for U.S. Navy Acoustic and Explosive Effects Analysis Technical Report (available at *http://www.nwtteis.com*). The revised thresholds are adopted for this rulemaking after providing the public with an opportunity for review and comment via the proposed rule for this action, which published on June 3, 2015 (80 FR 31737).

NOAA is currently in the process of developing Acoustic Guidance on thresholds for onset of auditory impacts from exposure to sound, which will be used to support assessments of the effects of anthropogenic sound on marine mammals. To develop this Guidance, NOAA is compiling, interpreting, and synthesizing the best information currently available on the effects of anthropogenic sound on marine mammals, and is committed to finalizing the Guidance through a systematic, transparent process that involves internal review, external peer review, and public comment.

In December 2013, NOAA released for public comment a "Draft Guidance for Assessing the Effects of Anthropogenic Sound on Marine Mammals: Acoustic Threshold Levels for Onset of Permanent and Temporary Threshold Shifts" (78 FR 78822). The Draft Guidance was generally consistent with the Navy's PTS/TTS criteria used in the NWTT FEIS/OEIS and detailed within Finneran and Jenkins (2012). Prior to the finalization of this guidance by NOAA, the Navy suggested revisions to the criteria (e.g., auditory weighting functions and PTS/TTS thresholds) based on a number of studies available since the Navy's Phase 2 modeling, including Finneran *et al*. (2005), Finneran *et al*. (2010), Finneran and Schlundt (2013), Kastelein *et al*. (2012a), Kastelein *et al.* (2012b), Kastelein *et al*. (2014a), Kastelein *et al*. (2014b), Popov *et al*. (2013), and Popov

et al. (2011). In January 2015, the Navy submitted a draft proposal (Finneran 2015) to NOAA staff for their consideration.

Finneran (2015) proposed new weighting functions and thresholds for predicting PTS/TTS in marine mammals. The methodologies presented within this paper build upon the methodologies used to develop the criteria used within the Navy's NWTT FEIS/OEIS (Finneran and Jenkins, 2012) and incorporate relevant auditory research made available since 2012. While Finneran and Jenkins (2012) presented a conservative approach to development of auditory weighting functions where data was limited, Finneran (2015) synthesizes a wide range of auditory data, including newly available studies, to predict refined auditory weighting functions and corresponding TTS thresholds across the complete hearing ranges of functional hearing groups. Finneran (2015) also developed updated threshold shift growth functions to facilitate the development of new PTS thresholds.

During the development process of NOAA's Draft Guidance, NOAA chose to incorporate Finneran (2015) into its Draft Guidance prior to its finalization. As a result, the Navy's proposal (Finneran 2015) was submitted for peer review by external subject matter experts, in accordance with the process previously conducted for NOAA's Draft Guidance. Peer review comments were received by NOAA in April 2015. NOAA subsequently developed a Peer Review Report, which was published on its website on July 31, 2015. The published report documents the Navy's proposal (Finneran 2015) that underwent peer review, the peer-review comments, and NOAA's responses to those comments. NOAA then incorporated this information into revised Draft Guidance which was published in the **Federal Register** for public review and comment (80 FR 45642) on

July 31, 2015. The auditory weighting functions and PTS/TTS thresholds provided in that revised Draft Guidance will not be adopted by NOAA or applied to applicants until Final Guidance is issued. At the time of this rulemaking, Final Guidance has not been issued. Therefore, the Navy has not adopted these proposed criteria in its NWTT FEIS/OEIS. However, the underlying science contained within Finneran (2015) has been addressed qualitatively within the applicable sections of the Final EIS/OEIS and this rulemaking.

If the proposed criteria in Finneran (2015) were adopted by NOAA, incorporated into its Final Guidance, and applied to the Navy in the future, predicted numbers of PTS/TTS would change for most functional hearing groups. However, because Finneran (2015) relies on much of the same data as the auditory criteria presented in the Navy's NWTT FEIS/OEIS, these changes would not be substantial, and in most cases would result in a reduction in the predicted impacts. Predicted PTS/TTS would be reduced over much to all of their hearing range for low-frequency cetaceans and phocids. Predicted PTS/TTS for mid-frequency and high-frequency cetaceans would be reduced for sources with frequencies below about 3.5 kHz and remain relatively unchanged for sounds above this frequency. Predicted auditory effects on otariids would increase for frequencies between about 1 kHz and 20 kHz and decrease for frequencies above and below these points, although otariids remain the marine mammals with the least sensitivity to potential PTS/TTS. Overall, predicted auditory effects within this rulemaking would not change significantly.

In summary, NOAA's continued evaluation of all available science for the Acoustic Guidance could result in changes to the acoustic criteria used to model the

Navy's activities for this rulemaking, and, consequently, the enumerations of "take" estimates. However, at this time, the results of prior Navy modeling described in this notice represent the best available estimate of the number and type of take that may result from the Navy's use of acoustic sources in the NWTT Study Area. Further, consideration of the revised Draft Guidance and information contained in Finneran (2015) does not alter our assessment of the likely responses of marine mammals to acoustic sources employed by Navy in the NWTT Study Area, or the likely fitness consequences of those responses. Finally, while acoustic criteria may also inform mitigation and monitoring decisions, this rulemaking requires a robust adaptive management program that regularly addresses new information and allows for modification of mitigation and/or monitoring measures as appropriate.

NMFS is also authorizing modifications to watchstander requirements, which do not affect current mitigation measures, for observed behavior of marine mammals during MTEs in the HSTT, AFTT, MITT, and GOA study areas. With these modifications the Navy would no longer be required to report individual marine mammal sighting information when mitigation is not being implemented during the MTEs. After 5 years of collecting marine mammal sighting data for all animals sighted during MTEs, NMFS and the Navy have determined that without the ability to obtain species information this data set does not provide for any meaningful analysis beyond that which may be possible using mitigation-related observations alone. The Navy and NMFS have thoroughly investigated several potential uses for the data prior to reaching this conclusion. Additionally, this reporting requirement places an undue administrative burden on ships watch teams, which was undue given the limited value of the information collected, as

was described during the Adaptive Management Process. The Navy will continue to collect marine mammal sighting data during MTEs for every instance when any form of mitigation is employed such as powering down or securing sonar, maneuvering the ship, or delaying an event—in other words, in instances where animals are closer to the sound source around which mitigation measures are implemented. This data is useful in supporting mitigation effectiveness analyses and also may be helpful in supporting an understanding of the frequency with which marine mammals (generally, not by species) may be encountered or detected in close proximity to a particular source (e.g., where the likelihood of auditory or other injury is higher). Additionally, the Navy will continue to implement its separate Integrated Comprehensive Monitoring Program, which includes studies that are specifically designed to contribute to our understanding of the animals affected and how Navy training and testing impacts them. These modifications shall be implemented through the revision of regulatory text for existing regulations governing the taking of marine mammals incidental to training and/or testing activities in HSTT, AFTT, MITT, and GOA study areas. Revisions to the regulatory text are provided in the regulatory text at the end of this final rule. There are no MTEs or marine mammal sighting reporting requirements associated with Navy training and testing activities in the NWTT study area, therefore this revision is not applicable in NWTT.

Description of the Specified Activity

The proposed rule (80 FR 31738, June 3, 2015) and NWTT FEIS/OEIS include a complete description of the Navy's specified training and testing activities incidental to which NMFS is authorizing take of marine mammals in this final rule. Sonar use and underwater detonations are the stressors most likely to result in impacts on marine

mammals that could rise to the level of harassment. Detailed descriptions of these activities are provided in the NWTT FEIS/OEIS and LOA application (*http://www.nmfs.noaa.gov/pr/permits/incidental/military.htm*) and are summarized here.

Overview of Training Activities

The Navy routinely trains in the NWTT Study Area in preparation for national defense missions. Training activities and exercises covered in the Navy's LOA request are briefly described below, and in more detail within Chapter 2 of the NWTT FEIS/OEIS. Training activities are categorized into eight functional warfare areas (anti-air warfare; amphibious warfare; strike warfare; anti-surface warfare; anti-submarine warfare; electronic warfare; mine warfare; and naval special warfare). The Navy determined that the following stressors used in these warfare areas are most likely to result in impacts on marine mammals:

- Anti-surface warfare (impulsive sources [underwater detonations])
- Anti-submarine warfare (non-impulsive sources [active sonar], impulsive underwater detonations)
- Mine warfare (non-impulsive sources, impulsive underwater detonations)

The Navy's activities in anti-air warfare, electronic warfare, and naval special warfare do not involve stressors that could result in harassment of marine mammals. Therefore, these activities are not discussed further. The analysis and rationale for excluding these warfare areas are contained in the NWTT FEIS/OEIS.

Overview of Testing Activities

Testing activities covered in the Navy's LOA request are briefly described below, and in more detail within Chapter 2 of the NWTT FEIS/OEIS. The Navy researches,

develops, tests, and evaluates new platforms, systems and technologies. Many tests are conducted in realistic conditions at sea, and can range in scale from testing new software to operating portable devices to conducting tests of live weapons (such as the Service Weapon Test of a torpedo) to ensure they function as intended. Testing activities may occur independently of or in conjunction with training activities.

Many testing activities are conducted similarly to Navy training activities and are also categorized under one of the primary mission areas described above. Other testing activities are unique and are described within their specific testing categories. Because each test is conducted by a specific component of the Navy's research and acquisition community, which includes the Navy's Systems Commands and the Navy's scientific research organizations, the testing activities described in the LOA application are organized first by that particular organization as described below and in the order as presented.

The Navy describes and analyzes the effects of its testing activities within the NWTT FEIS/OEIS. In its assessment, the Navy concluded that acoustic stressors from the use of underwater acoustic sources and underwater detonations resulted in impacts on marine mammals that rose to the level of harassment as defined under the MMPA. Therefore, the LOA application for the NWTT Study Area provides the Navy's assessment of potential effects from these stressors in terms of the various activities that produce them.

The individual commands within the research and acquisition community included in the NWTT FEIS/OEIS and in the LOA application are:

- Naval Sea Systems Command (NAVSEA). Within NAVSEA are the following field activities:
    - Naval Undersea Warfare Center (NUWC) Division, Keyport
    - Naval Surface Warfare Center, Carderock Division (NSWCCD), Detachment Puget Sound
    - NSWCCD Southeast Alaska Acoustic Measurement Facility (SEAFAC)
    - Puget Sound Naval Shipyard and Intermediate Maintenance Facility
    - Various NAVSEA program offices
- Naval Air Systems Command (NAVAIR)

Description of Sonar, Ordnance, Targets, and Other Systems

The Navy uses a variety of sensors, platforms, weapons, and other devices to meet its mission. Training and testing with these systems may introduce acoustic (sound) energy into the environment. This section describes and organizes sonar systems, ordnance, munitions, targets, and other systems to facilitate understanding of the activities in which these systems are used. Underwater sound is described as one of two types for the purposes of the LOA application: impulsive and non-impulsive. Sonar and similar sound producing systems are categorized as non-impulsive sound sources. Underwater detonations of explosives and other percussive events are impulsive sounds.

Sonar and Other Active Acoustic Sources

Modern sonar technology includes a variety of sonar sensor and processing systems. The simplest active sonar emits sound waves, or “pings,” sent out in multiple

directions and the sound waves then reflect off of the target object in multiple directions. The sonar source calculates the time it takes for the reflected sound waves to return; this calculation determines the distance to the target object. More sophisticated active sonar systems emit a ping and then rapidly scan or listen to the sound waves in a specific area. This provides both distance to the target and directional information. Even more advanced sonar systems use multiple receivers to listen to echoes from several directions simultaneously and provide efficient detection of both direction and distance. The Navy rarely uses active sonar continuously throughout activities. When sonar is in use, the pings occur at intervals, referred to as a duty cycle, and the signals themselves are very short in duration. For example, sonar that emits a 1-second ping every 10 seconds has a 10-percent duty cycle. The Navy's largest hull-mounted mid-frequency sonar source nominally emits a 1-second ping every 50 seconds representing a 2% duty cycle. The Navy utilizes sonar systems and other acoustic sensors in support of a variety of mission requirements. Primary uses include the detection of and defense against submarines (anti-submarine warfare) and mines (mine warfare); safe navigation and effective communications; use of unmanned undersea vehicles; and oceanographic surveys. Sources of sonar and other active acoustic sources include surface ship sonar, sonobuoys, torpedoes, range pingers, and unmanned underwater vehicles.

Ordnance and Munitions

Most ordnance and munitions used during training and testing events fall into three basic categories: projectiles (such as gun rounds), missiles (including rockets), and bombs. Ordnance can be further defined by their net explosive weight, which considers the type and quantity of the explosive substance without the packaging, casings, bullets,

etc. Net explosive weight (NEW) is the trinitrotoluene (TNT) equivalent of energetic material, which is the standard measure of strength of bombs and other explosives. For example, a 12.7-centimeter (cm) shell fired from a Navy gun is analyzed at about 9.5 pounds (lb) (4.3 kilograms (kg)) of NEW. The Navy also uses non-explosive ordnance in place of high explosive ordnance in many training and testing events. Non-explosive ordnance look and perform similarly to high explosive ordnance, but lack the main explosive charge.

Defense Countermeasures

Naval forces depend on effective defensive countermeasures to protect themselves against missile and torpedo attack. Defensive countermeasures are devices designed to confuse, distract, and confound precision-guided munitions. Defensive countermeasures analyzed in the LOA application include acoustic countermeasures, which are used by surface ships and submarines to defend against torpedo attack. Acoustic countermeasures are either released from ships and submarines, or towed at a distance behind the ship.

Mine Warfare Systems

The Navy divides mine warfare systems into two categories: mine detection and mine neutralization. Mine detection systems are used to locate, classify, and map suspected mines, on the surface, in the water column, or on the seafloor. The Navy analyzed the following mine detection systems for potential impacts to marine mammals:

- Towed or hull-mounted mine detection systems. These detection systems use acoustic and laser or video sensors to locate and classify suspect mines. Fixed

and rotary wing platforms, ships, and unmanned vehicles are used for towed systems, which can rapidly assess large areas.

- Airborne Laser Mine Detection Systems. Airborne laser detection systems work in concert with neutralization systems. The detection system initially locates mines and a neutralization system is then used to relocate and neutralize the mine.
- Unmanned/remotely operated vehicles. These vehicles use acoustic and video or lasers to locate and classify mines and provide unique capabilities in nearshore littoral areas, surf zones, ports, and channels.

Mine neutralization systems disrupt, disable, or detonate mines to clear ports and shipping lanes, as well as littoral, surf, and beach areas in support of naval amphibious operations. Mine neutralization systems can clear individual mines or a large number of mines quickly. The Navy analyzed the following mine neutralization systems for potential impacts to marine mammals:

- Towed influence mine sweep systems. These systems use towed equipment that mimic a particular ship's magnetic and acoustic signature triggering the mine and causing it to explode.
- Towed mechanical mine sweeping systems. These systems tow a sweep wire to snag the line that attaches a moored mine to its anchor and then uses a series of cables and cutters to sever those lines. Once these lines are cut, the mines float to the surface where Navy personnel can neutralize the mines.
- Unmanned/remotely operated mine neutralization systems. Surface ships and helicopters operate these systems, which place explosive charges near or directly against mines to destroy the mine.

- Projectiles. Small- and medium-caliber projectiles, fired from surface ships or hovering helicopters, are used to neutralize floating and near-surface mines.
- Diver emplaced explosive charges. Operating from small craft, divers put explosive charges near or on mines to destroy the mine or disrupt its ability to function.

Explosive charges are used during mine neutralization system training activities; however, only non-explosive mines or mine shapes would be used.

Classification of Non-impulsive and Impulsive Sources Analyzed

In order to better organize and facilitate the analysis of about 300 sources of underwater non-impulsive sound or impulsive energy, the Navy developed a series of source classifications, or source bins. This method of analysis provides the following benefits:

- Allows for new sources to be covered under existing authorizations, as long as those sources fall within the parameters of a "bin;"
- Simplifies the data collection and reporting requirements anticipated under the MMPA;
- Ensures a conservative approach to all impact analysis because all sources in a single bin are modeled as the loudest source (e.g., lowest frequency, highest source level, longest duty cycle, or largest net explosive weight within that bin);
- Allows analysis to be conducted more efficiently, without compromising the results;
- Provides a framework to support the reallocation of source usage (hours/explosives) between different source bins, as long as the total number and

severity of marine mammal takes remain within the overall analyzed and authorized limits. This flexibility is required to support evolving Navy training and testing requirements, which are linked to real world events.

A description of each source classification is provided in Tables 1 - 3. Non-impulsive sources are grouped into bins based on the frequency, source level when warranted, and how the source would be used. Impulsive bins are based on the net explosive weight of the munitions or explosive devices. The following factors further describe how non-impulsive sources are divided:

- Frequency of the non-impulsive source:
    - Low-frequency sources operate below 1 kilohertz (kHz)
    - Mid-frequency sources operate at or above 1 kHz, up to and including 10 kHz
    - High-frequency sources operate above 10 kHz, up to and including 100 kHz
    - Very high-frequency sources operate above 100 kHz, but below 200 kHz
- Source level of the non-impulsive source:
    - Greater than 160 decibels (dB), but less than 180 dB
    - Equal to 180 dB and up to 200 dB
    - Greater than 200 dB

How a sensor is used determines how the sensor's acoustic emissions are analyzed. Factors to consider include pulse length (time source is on); beam pattern (whether sound is emitted as a narrow, focused beam, or, as with most explosives, in all

directions); and duty cycle (how often a transmission occurs in a given time period during an event).

There are also non-impulsive sources with characteristics that are not anticipated to result in takes of marine mammals. These sources have low source levels, narrow beam widths, downward directed transmission, short pulse lengths, frequencies beyond known hearing ranges of marine mammals, or some combination of these factors. These sources were not modeled by the Navy, but are qualitatively analyzed in Table 1-4 of the LOA application and in the NWTT FEIS/OEIS. These sources generally meet the following criteria:

- Acoustic sources with frequencies greater than 200 kHz (based on known marine mammal hearing ranges)
- Sources with source levels less than 160 dB

Table 1. Impulsive training and testing source classes analyzed.

Source Class	Representative Munitions	Net Explosive Weight (lbs)
E1	Medium-caliber projectiles	0.1-0.25
E3	Large-caliber projectiles	>0.5-2.5
E4	Improved Extended Echo Ranging Sonobuoy	>2.5-5.0
E5	5 in. (12.7 cm) projectiles	>5-10
E8	250 lb. bomb, lightweight torpedo	>60-100
E10	1,000 lb. bomb, Air-to-Surface Missile	>250-500
E11	650 lb. mine, heavyweight torpedo	>500-650
E12	2,000 lb. bomb	>650-1,000

Table 2. Non-impulsive training source classes analyzed.

Source Class Category	Source Class	Description
Mid-Frequency (MF):	MF1	Active hull-mounted surface ship sonar (e.g., AN/SQS-53C and AN/SQS-60)

Tactical and non-tactical sources that produce mid-frequency (1 to 10 kHz) signals	MF3	Active hull-mounted submarine sonar (e.g., AN/BQQ-10)
	MF4	Active helicopter-deployed dipping sonar (e.g., AN/AQS-22 and AN/AQS-13)
	MF5	Active acoustic sonobuoys (e.g., AN/SSQ-62 DICASS[2])
	MF11	Hull-mounted surface ship sonar with an active duty cycle greater than 80%
High-Frequency (HF) and Very High-Frequency (VHF): Tactical and non-tactical sources that produce high-frequency (greater than 10 kHz but less than 200 kHz) signals	HF1	Active hull-mounted submarine sonar (e.g., AN/BQQ-15)
	HF4	Active mine detection, classification, and neutralization sonar (e.g., AN/SQS-20)
	HF6	Active sources (equal to 180 dB and up to 200 dB)
Anti-Submarine Warfare (ASW): Tactical sources such as active sonobuoys and acoustic countermeasures systems used during ASW training activities	ASW2	MF active Multistatic Active Coherent (MAC) sonobuoy (e.g., AN/SSQ-125)
	ASW3	MF active towed active acoustic countermeasure systems (e.g., AN/SLQ-25 NIXIE)

Table 3. Non-impulsive testing source classes analyzed.

Source Class Category	Source Class	Description
Low-Frequency (LF): Sources that produce low-frequency (less than 1 kilohertz [kHz]) signals	LF4	Low-frequency sources equal to 180 dB and up to 200 dB
	LF5	Low-frequency sources less than 180 dB
Mid-Frequency (MF): Tactical and non-tactical sources that produce mid-	MF1	Active hull-mounted surface ship sonar (e.g., AN/SQS-53C and AN/SQS-60)
	MF3	Hull-mounted submarine sonar (e.g., AN/BQQ-10)
	MF4	Helicopter-deployed dipping sonar (e.g., AN/AQS-22 and AN/AQS-13)

frequency (1 to 10 kHz) signals	MF5	Active acoustic sonobuoys (e.g., DICASS)
	MF6	Active underwater sound signal devices (e.g., MK-84)
	MF8	Active sources (greater than 200 dB)
	MF9	Active sources (equal to 180 dB and up to 200 dB)
	MF10	Active sources (greater than 160 dB, but less than 180 dB) not otherwise binned
	MF11	Hull-mounted surface ship sonar with an active duty cycle greater than 80%
	MF12	High duty cycle – variable depth sonar
High-Frequency (HF) and Very High-Frequency (VHF): Tactical and non-tactical sources that produce high-frequency (greater than 10 kHz but less than 200 kHz) signals	HF1	Hull-mounted submarine sonar (e.g., AN/BQQ-10)
	HF3	Hull-mounted submarine sonar (classified)
	HF5[1]	Active sources (greater than 200 dB)
	HF6	Active sources (equal to 180 dB and up to 200 dB)
	VHF2	Active sources with a frequency greater than 100 kHz, up to 200 kHz with a source level less than 200 dB
Anti-Submarine Warfare (ASW): Tactical sources such as active sonobuoys and acoustic countermeasures systems used during the conduct of ASW testing activities	ASW1	Mid-frequency Deep Water Active Distributed System (DWADS)
	ASW2	Mid-frequency Multistatic Active Coherent sonobuoy (e.g., AN/SSQ-125) - sources analyzed by number of items (sonobuoys)
	ASW2	Mid-frequency sonobuoy (e.g., high duty cycle) – Sources that are analyzed by hours
	ASW3	Mid-frequency towed active acoustic countermeasure systems (e.g., AN/SLQ-25)
	ASW4	Mid-frequency expendable active acoustic device countermeasures (e.g., MK-3)
Torpedoes (TORP): Source classes associated with the active acoustic signals produced by torpedoes	TORP1	Lightweight torpedo (e.g., MK-46, MK-54)
	TORP2	Heavyweight torpedo (e.g., MK-48, electric vehicles)
Acoustic Modems (M): Systems used to transmit data acoustically through water	M3	Mid-frequency acoustic modems and similar sources (up to 210 dB) (e.g., Underwater Emergency Warning System, Aid to Navigation)

Swimmer Detection Sonar (SD): Systems used to detect divers and submerged swimmers	SD1	High-frequency sources with short pulse lengths, used for the detection of swimmers and other objects for the purpose of port security
Synthetic Aperture Sonar (SAS): Sonar in which active acoustic signals are post-processed to form high-resolution images of the seafloor.	SAS2	High frequency unmanned underwater vehicle (UUV) (e.g., UUV payloads)

[1]Notes: (1) For this analysis, HF5 consists of only one source; the modeling was conducted specifically for that source.
(2) DICASS = Directional Command Activated Sonobuoy System Proposed Action

Training and Testing

The training and testing activities that the Navy proposes to conduct in the NWTT Study Area are listed in Tables 4 - 6. Detailed information about each activity (stressor, training or testing event, description, sound source, duration, and geographic location) can be found in the LOA application and in Appendix A of the NWTT FEIS/OEIS. NMFS used the detailed information in the LOA application and in Appendix A of the NWTT FEIS/OEIS to analyze the potential impacts from training and testing activities on marine mammals. The Navy's activities are anticipated to meet training and testing needs in the years 2015–2020.

Correction to Sonar Testing Activities

During the development of the Navy's NWTT Draft, Supplemental and Final EIS/OEIS, 8 proposed life cycle pierside sonar testing events involving surface ships at Naval Station (NS) Everett were incorrectly modeled as 8 life cycle pierside sonar testing events involving submarines at Naval Base Kitsap (NBK) – Bremerton. The Navy identified this error while considering, at the request of NMFS, the overlap of NWTT activities within biologically important areas. Although documents released to the public

for comment, including the NWTT Draft, Supplemental and Final EIS/OEIS, the Navy's LOA application, and NMFS' proposed rule qualitatively describe life cycle pierside sonar testing events as occurring at both NBK – Bremerton and Naval Station Everett, the quantitative analysis of impacts on marine mammals that could result from these activities is based on modeling data for more events occurring at NBK – Bremerton and fewer events than required occurring at Naval Station Everett. Additionally, both the FEIS/OEIS and the proposed rule already included and considered quantitative analysis for Naval Station Everett pierside surface ship sonar maintenance training events, events which are similar in both conduct and effects to life cycle pierside sonar testing events.

The Navy corrected the error by eliminating 8 life cycle pierside sonar testing events involving submarines and their associated hours at NBK – Bremerton and adding 8 life cycle pierside sonar testing events involving surface ships and their associated hours to Naval Station Everett. This correction results in a reduction of hours in the MF3 bin (submarine sonar) and an addition of hours to the MF1 bin (surface ship sonar). Life cycle pierside sonar testing events involving submarines require use of up to 2 hours of MF3 sonar per event. Life cycle pierside sonar testing events involving surface ships require use of up to 4 hours of MF1 sonar per event. Given this difference between submarine and surface ship life cycle pierside sonar testing, elimination of the 8 submarine events at NBK– Bremerton will result in an overall reduction of 16 MF3 hours and addition of the 8 surface ship events at Naval Station Everett will result in an overall increase of 32 MF1 hours.

These revisions have been incorporated in this final rule (Table 5). Further, the updated predicted exposures resulting from this correction are included in the estimated

Take of Marine Mammals section of this rule and depicted in Table 18, and the resulting analysis is discussed in the Analysis and Negligible Impact Determination section of this rule.

Summary of Non-Impulsive and Impulsive Sources

Table 4 provides a quantitative annual summary of training activities by sonar and other active acoustic source class analyzed in the Navy's LOA request.

Table 4. Annual hours of sonar and other active acoustic sources used during training within the NWTT Study Area.

Source Class Category	Source Class	Annual Use
Mid-Frequency (MF) Active sources from 1 to 10 kHz	MF1	166 hours
	MF3	70 hours
	MF4	4 hours
	MF5	896 items
	MF11	16 hours
High-Frequency (HF) Tactical and non-tactical sources that produce signals greater than 10kHz but less than 100kHz	HF1	48 hours
	HF4	384 hours
	HF6	192 hours
Anti-Submarine Warfare (ASW)	ASW2	720 items
	ASW3	78 hours

Table 5 provides a quantitative annual summary of testing activities by sonar and other active sources analyzed in the Navy's LOA request.

Table 5. Annual hours of sonar and other active acoustic sources used during testing within the NWTT Study Area.

Source Class Category	Source Class	Annual Use
Low-Frequency (LF): Sources that produce signals less than 1 kHz	LF4	110 hours
	LF5	71 hours
Mid-Frequency (MF): Tactical and non-tactical sources that produce signals from 1 to 10	MF1	32 hours
	MF3	145 hours
	MF4	10 hours

kHz	MF5	273 items
	MF6	12 items
	MF8	40 hours
	MF9	1,183 hours
	MF10	1,156 hours
	MF11	34 hours
	MF12	24 hours
High-Frequency (HF) and Very High-Frequency (VHF): Tactical and non-tactical sources that produce signals greater than 10 kHz but less than 200 kHz	HF1	161 hours
	HF3	145 hours
	HF5[1]	360 hours
	HF6	2,099 hours
Very High-Frequency (VHF): Tactical and non-tactical sources that produce signals greater than 100 kHz but less than 200 kHz	VHF2	35 hours
Anti-Submarine Warfare (ASW): Tactical sources used during ASW training and testing activities	ASW1	16 hours
	ASW2[2]	64 hours
	ASW2[2]	170 items
	ASW3	444 hours
	ASW4	1,182 hours
Torpedoes (TORP): Source classes associated with active acoustic signals produced by torpedoes	TORP1	315 items
	TORP2	299 items
Acoustic Modems (M): Transmit data acoustically through the water	M3	1,519 hours
Swimmer Detection Sonar (SD): Used to detect divers and submerged swimmers	SD1	757 hours
Synthetic Aperture Sonar (SAS): Sonar in which active acoustic signals are post-processed to form high-resolution images of the seafloor	SAS2	798 hours

[1]For this analysis, HF5 consists of only one source; the modeling was conducted specifically for that source
[2]The ASW2 bin contains sources that are analyzed by hours and some that are analyzed by count of items. There is no overlap of the numbers in the two rows.

Table 6 provides a quantitative annual summary of training explosive source classes analyzed in the Navy's LOA request.

Table 6. Proposed annual number of impulsive source detonations during training in the NWTT Study Area.

Explosive Class	Net Explosive Weight (NEW)	Annual In-Water Detonations (Training)
E1	(0.1 lb. – 0.25 lb.)	48
E3	(>0.5 lb. – 2.5 lb.)	6
E5	(>5 lb.-10 lb.)	80
E10	(>250 lb. – 500 lb.)	4
E12	(>650 lb. – 1000 lb.)	10

Table 7 provides a quantitative annual summary of testing explosive source classes analyzed in the Navy's LOA request.

Table 7. Proposed annual number of impulsive source detonations during testing in the NWTT Study Area.

Explosive Class	Net Explosive Weight (NEW)	Annual In-Water Detonations (Testing)
E3	(>0.5 lb. – 2.5 lb.)	72
E4	(>2.5 lb. – 5 lb.)	140 (70 buoys)
E8	(>60 lb. – 100 lb.)	3
E11	(>500 lb. – 650 lb.)	3

Other Stressors – Vessel Strikes

In addition to potential impacts to marine mammals from activities during which explosives or sonar and other active acoustic sources are used, the Navy also considered potential ship strike impacts to marine mammals, which are discussed below. The Navy concluded that no additional stressors would result in a take and require authorization under the MMPA.

Vessel strikes may occur from surface operations and sub-surface operations (excluding bottom crawling, unmanned underwater vehicles). Vessels used as part of the

Navy's NWTT training and testing activities (proposed action) include ships, submarines and boats ranging in size from small, 16-foot (ft.) (5-meter [m]) rigid hull inflatable boats to aircraft carriers with lengths up to 1,092 ft. (333 m). Representative Navy vessel types, lengths, and speeds used in both training and testing activities are shown in Table 8.

Table 8. Representative Navy vessel types, lengths, and speeds used within the NWTT Study Area.

Vessel Type	Example(s)	Length	Typical Operating Speed	Max Speed
Aircraft Carrier	Aircraft Carrier	>900 ft (>300 m)	10-15 knots	30+ knots
Surface Combatants	Cruisers, Destroyers, Littoral Combat Ships	330-660 ft (100-200 m)	10-15 knots	30+ knots
Support Craft/Other	Range Support Craft, Combat Rubber Raiding Craft, Landing Craft, Utility; Submarine Tenders, Yard Patrol Craft, Protection Vessels, Barge	16-250 ft (5-80 m)	Variable	20 knots
Support Craft/Other – Specialized High Speed	Patrol Coastal Ships, Patrol Boats, Rigid Hull Inflatable Boat, High Speed Protection Vessels	33-130 ft (10-40 m)	Variable	50+ knots
Submarines	Fleet Ballistic Missile Submarines, Attack Submarines, Guided Missile Submarines	330-660 ft (100-200 m)	8-13 knots	20+ knots

Large Navy ships greater than 65 ft. (20 m) generally operate at speeds in the range of 10–15 knots for fuel conservation when cruising. Submarines generally operate at speeds in the range of 8–13 knots during transit and slower for certain tactical maneuvers. Small craft (for purposes of this discussion less than 65 ft. [20 m] in length) have much more variable speeds, dependent on the mission. While these speeds are representative, some vessels operate outside of these speeds due to unique training, testing, or safety requirements for a given event. Examples include increased speeds

needed for flight operations, full speed runs to test engineering equipment, time critical positioning needs, etc. Examples of decreased speeds include speeds less than 5 knots or completely stopped for launching small boats, certain tactical maneuvers, target launch or retrievals, etc.

The number of Navy vessels in the Study Area varies based on training and testing schedules. Most activities include either one or two vessels, with an average of one vessel per activity, and last from a few hours up to 2 weeks. Vessel movement and the use of in-water devices as part of the proposed action would be concentrated in certain portions of the Study Area (such as Western Behm Canal [Alaska] or Hood Canal in the inland waters portion of the Study Area) but may occur anywhere within the Study Area.

The Navy analyzed the potential environmental impacts of approximately 286 ongoing annual Maritime Security Operations events in Puget Sound and the Strait of Juan de Fuca. Included in this activity are approximately 226 annual Transit Protection System training events. These critical events have been occurring since 2006 and exercise the Navy's Transit Protection System, where up to nine escort vessels provide protection during all nuclear ballistic missile submarine (SSBN) transits between the vessel’s homeport and the dive/surface point in the Strait of Juan de Fuca or Dabob Bay. During a Transit Protection System event, the security escorts enforce a moving 1,000yard security zone around the SSBN to prevent other vessels from approaching while the SSBN is in transit on the surface. These events include security escort vessels, U.S. Coast Guard personnel and their ancillary equipment and weapons systems. The Transit Protection System involves the movement of security vessels and also includes

periodic exercises and firearms training (with blank rounds). Given the relative slow speed of the escorted and blocking vessels and multiple lookouts, no marine mammal vessel strikes are expected as a result of these events.

In addition to Transit Protection System events, the Navy would conduct approximately 60 annual maritime security escort training events with Coastal Riverine Group boats that conduct force protection for designated vessels and movements. These Coastal Riverine Group boat crews train to protect ships while entering and leaving ports. Other missions include ensuring compliance with vessel security zones for ships in port and at anchor, conducting patrols to counter waterborne threats, and conducting harbor approach defense. Special consideration will be given to the presence of marine mammals during training events. Training will be paused until marine mammals have cleared the area, or the training area will be temporarily relocated.

Navy policy (Chief of Naval Operations Instruction 3100.6H) requires Navy vessels to report all whale strikes. That information is collected by the Office of the Chief of Naval Operations Energy and Environmental Readiness Division (OPNAV N45) and cumulatively provided to NMFS on an annual basis. In addition, the Navy and NMFS also have standardized regional reporting protocols for communicating to regional NMFS stranding coordinators information on any Navy vessel strikes as soon as possible. These communication procedures will remain in place for the duration of the LOAs. There are no records of any Navy vessel strikes to marine mammals during training or testing activities in the NWTT Study Area.

Duration and Location

Training and testing activities will be conducted in the NWTT Study Area for the reasonably foreseeable future. The description of the location of authorized activities has not changed from what was provided in the proposed rule (80 FR 31737, June 3, 2015; pages 31747-31749) and NWTT FEIS/OEIS (*http://www.nwtteis.com*). For a complete description, please see those documents. The Study Area is composed of established maritime operating and warning areas in the eastern North Pacific Ocean region, including areas of the Strait of Juan de Fuca, Puget Sound, and Western Behm Canal in southeastern Alaska. The Study Area includes air and water space within and outside Washington state waters, and outside the state waters of Oregon and Northern California. The Study Area includes four existing range complexes and facilities: the Northwest Training Range Complex (NWTRC), the Keyport Range Complex, Carr Inlet Operations Area, and SEAFAC. In addition to these range complexes, the Study Area also includes Navy pierside locations where sonar maintenance and testing occurs as part of overhaul, modernization, maintenance and repair activities at NAVBASE Kitsap, Bremerton; NAVBASE Kitsap, Bangor; and Naval Station Everett.

Description of Marine Mammals in the Area of the Specified Activities

Twenty-nine marine mammal species are known to occur in the Study Area, including seven mysticetes (baleen whales), 16 odontocetes (dolphins and toothed whales), and six pinnipeds (seals and sea lions). The Description of Marine Mammals in the Area of the Specified Activities section was included in the proposed rule (80 FR 31737, June 3, 2015, 2014; pages 31749-31750). Table 9 of the proposed rule provided a list of marine mammals with possible or confirmed occurrence within the NWTT Study Area, including stock, abundance, and status.

The proposed rule, the Navy's LOA application, and the NWTT FEIS/OEIS include a complete description of information on the status, distribution, abundance, vocalizations, density estimates, and general biology of marine mammal species in the Study Area. In addition, NMFS publishes annual stock assessment reports for marine mammals, including some stocks that occur within the Study Area (*http://www.nmfs.noaa.gov/pr/species/mammals*).

Potential Effects of Specified Activities on Marine Mammals

In the Potential Effects of Specified Activities on Marine Mammals section of the proposed rule (80 FR 31737, June 3, 2015; pages 31752-31769), we included a qualitative discussion of the different ways that Navy training and testing activities may potentially affect marine mammals without consideration of mitigation and monitoring measures. That information has not changed and is not repeated here.

Mitigation

Under section 101(a)(5)(A) 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." NMFS' duty under this "least practicable adverse impact" standard is to prescribe mitigation reasonably designed to minimize, to the extent practicable, any adverse population-level impacts, as well as habitat impacts. While population-level impacts are minimized by reducing impacts on individual marine mammals, not all takes have a reasonable potential for translating to population-level impacts. NMFS' objective under the "least practicable adverse impact" standard is to design mitigation targeting those impacts on

individual marine mammals that are reasonably likely to contribute to adverse population-level effects.

The NDAA of 2004 amended the MMPA as it relates to military readiness activities and the ITA 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." The training and testing activities described in the Navy's LOA application are considered military readiness activities.

In *Conservation Council for Hawaii v. National Marine Fisheries Service*, No. 1:13-cv-00684 (D. Hawaii March 31, 2015), the court stated that NMFS "appear[s] to think that [it] satisf[ies] the statutory 'least practicable adverse impact' requirement with a 'negligible impact' finding." In light of the court's decision, we take this opportunity to make clear our position that the "negligible impact" and "least practicable adverse impact" requirements are distinct, even though the focus of both is on population-level impacts.

A population-level impact is an impact on the population numbers (survival) or growth and reproductive rates (recruitment) of a particular marine mammal species or stock. As we noted in the preamble to our general MMPA implementing regulations, not every population-level impact violates the negligible impact requirement. As we explained, the negligible impact standard does not require a finding that the anticipated take will have "no effect" on population numbers or growth rates: "The statutory standard does not require that the same recovery rate be maintained, rather that no significant effect on annual rates of recruitment or survival occurs… [T]he key factor is the significance of the level of impact on rates of recruitment or survival. Only

insignificant impacts on long-term population levels and trends can be treated as negligible." See 54 Fed. Reg. 40338, 40341-42 (September 29, 1989). Nevertheless, while insignificant impacts on population numbers or growth rates may satisfy the negligible impact requirement, such impacts still must be mitigated, to the extent practicable, under the "least practicable adverse impact" requirement. Thus, the negligible impact and least practicable adverse impact requirements are clearly distinct, even though both focus on population-level effects.

As explained in the proposed rule, 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 accomplishing one or more of the general goals listed below:

a. Avoid or minimize injury or death of marine mammals wherever possible (goals b, c, and d may contribute to this goal).

b. Reduce the numbers of marine mammals (total number or number at biologically important time or location) exposed to received levels of MFAS/HFAS, underwater detonations, or other activities expected to result in the take of marine mammals (this goal may contribute to a, above, or to reducing harassment takes only).

c. Reduce the number of times (total number or number at biologically important time or location) individuals would be exposed to received levels of MFAS/HFAS, underwater detonations, or other activities expected to result in the take of marine mammals (this goal may contribute to a, above, or to reducing harassment takes only).

d. Reduce the intensity of exposures (either total number or number at biologically important time or location) to received levels of MFAS/HFAS, underwater detonations, or other activities expected to result in the take of marine mammals (this goal may contribute to a, above, or to reducing the severity of harassment takes only).

e. Avoid or minimize adverse effects to marine mammal habitat (including acoustic 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.

f. For monitoring directly related to mitigation – increase the probability of detecting marine mammals, thus allowing for more effective implementation of the mitigation (shut-down zone, etc.).

Our final evaluation of measures that meet one or more of the above goals includes consideration of the following factors in relation to one another: The manner in which, and the degree to which, the successful implementation of the mitigation measures is expected to reduce population-level impacts to marine mammal species and stocks and impacts to their habitat; the proven or likely efficacy of the measures; and the practicability of the suite of measures for applicant implementation, including consideration of personnel safety, practicality of implementation, and impact on the effectiveness of the military readiness activity.

NMFS reviewed the proposed activities and the suite of proposed mitigation measures as described in the Navy's LOA application to determine if they would result in

the least practicable adverse effect on marine mammals. NMFS described the Navy's proposed mitigation measures in detail in the proposed rule (80 FR 31738, June 3, 2015; pages 31771-31780). NMFS worked with the Navy in the development of the Navy's initially proposed measures, and they are informed by years of experience and monitoring. As described in the Mitigation Conclusions below and in responses to comments, and in the NWTT FEIS/OEIS, some additional measures were considered and analyzed, but ultimately not chosen for implementation. However, some area-specific mitigation measures considered by the Navy and NMFS for the Navy's low use of mid-frequency active sonar and other activities in certain areas of particular importance to marine mammals have been clarified or updated below (see *Consideration of Time/Area Limitation*) and in the Comments and Responses section of this rule. These additional area-specific measures are also included in the regulatory text (see § 218.144 Mitigation**)** at the end of this rule. Below are the mitigation measures as agreed upon by the Navy and NMFS. For additional details regarding the Navy's mitigation measures, see Chapter 5 in the NWTT FEIS/OEIS.

- At least one Lookout during the training and testing activities provided in Table 9;
- Mitigation zones ranging from 70 yards (yd) (64 m) to 2.5 nautical miles (nm) during applicable activities that involve the use of impulsive and non-impulsive sources to avoid or reduce the potential for onset of the lowest level of injury, PTS, out to the predicted maximum range (Table 10).
- For all training activities and for testing activities involving surface ships, vessels shall maneuver to keep at least 500 yd (457 m) away from whales and 200 yd (183 m) away from all other marine mammals (except bow riding dolphins, and

pinnipeds hauled out on man-made navigational and port structures and vessels) during vessel movements. These requirements do not apply if a vessel's safety is threatened and to the extent that vessels are restricted in their ability to maneuver (e.g. launching and recovering aircraft or landing craft, towing activities, mooring, etc.) (Table 10).

- For testing activities not involving surface ships (e.g. range craft), vessels shall maneuver to keep at least 100 yd (91 m) away from marine mammals (except bow-riding dolphins, pinnipeds hauled out on man-made navigational and port structures and vessels, and pinnipeds during test body retrieval) during vessel movements. These requirements do not apply if a vessel's safety is threatened and to the extent that vessels are restricted in their ability to maneuver (e.g. launching and recovering aircraft or landing craft, towing activities, mooring, etc.) (Table 10).
- The Navy will ensure that towed in-water devices being towed from manned platforms avoid coming within a mitigation zone of 250 yd (229 m) for all training events and testing activities involving surface ships, and a mitigation zone of 100 yd (91 m) for testing activities not involving surface ships (e.g. range craft) around any observed marine mammal, providing it is safe to do so.
- Mitigation zones ranging from 200 yd (183 m) to 1,000 yd (914 m) during activities that involve the use of non-explosive practice munitions.
- The Navy is clarifying its existing speed protocol: while in transit, Navy vessels shall be alert at all times, use extreme caution, and proceed at a "safe speed" so that the vessel can take proper and effective action to avoid a collision with any

sighted object or disturbance, including any marine mammal or sea turtle and can be stopped within a distance appropriate to the prevailing circumstances and conditions.

Table 9. Lookout mitigation measures for training and testing activities within the NWTT Study Area.

Number of Lookouts	Training and Testing Activities
1-2	Low-Frequency and Hull Mounted Mid-Frequency Active Sonar
1-2	High- Frequency and Non-Hull Mounted Mid-Frequency Active Sonar
1	Improved Extended Echo Ranging Sonobuoys (testing only)
1	Explosive Signal Underwater Sound Buoys Using >0.5-2.5 Pound Net Explosive Weight
2	Mine Countermeasures and Neutralization Activities Using Positive Control Firing Devices (training only)
1-2	Gunnery Exercises Using Surface Target (training only)
1	Missile Exercises Using Surface Target (training only)
1 (minimum)	Bombing Exercises – Explosive (training only)
1-2	Torpedo – Explosive (testing only) [1]
1	Weapons Firing Noise During Gunnery Exercises (training only)
1 (minimum)	Vessel Movement
1	Towed In-Water Device
1	Gunnery Exercises - Non-Explosive (training only)
1	Bombing Exercises – Non-Explosive (training only)

[1] For explosive torpedo tests from aircraft, the Navy will have one Lookout positioned in an aircraft; for explosive torpedoes tested from a surface ship, the Navy is proposing to use the Lookout procedures currently implemented for hull-mounted mid-frequency active sonar activities.

Table 10. Predicted ranges to TTS, PTS, and recommended mitigation zones for each activity category.

Activity Category	Bin (Representative Source) [1]	Predicted Average Range to TTS	Predicted Average Range to PTS	Predicted Maximum Range to PTS	Recommended Mitigation Zone
Non-Impulsive Sound					
Low-Frequency and Hull-Mounted Mid-Frequency Active Sonar[2]	SQS-53 ASW hull-mounted sonar (MF1)	4,251 yd. (3,887 m) for one ping	100 yd. (91 m) for one ping	Not applicable	Training: 1,000 yd. (914 m) and 500 yd. (457 m) power downs and 200 yd. (183 m) shutdown for cetaceans, 100 yd. (91 m) mitigation zone for pinnipeds (excludes haulout areas) Testing: 1,000 yd. (914 m) and 500 yd. (457 m) power downs for sources that can be powered down and 200 yd. (183 m) shutdown for cetaceans, 100 yd. (91 m) for pinnipeds (excludes haulout areas)
High-Frequency and Non-Hull-Mounted Mid-Frequency Active Sonar[2]	AQS-22 ASW dipping sonar (MF4)	226 yd. (207 m) for one ping	20 yd. (18 m) for one ping	Not applicable	Training: 200 yd. (183 m) Testing: 200 yd. (183 m) for cetaceans, 100 yd. (91 m) for pinnipeds (excludes haulout areas)
Explosive and Impulsive Sound					
Improved Extended Echo Ranging Sonobuoys	Explosive sonobuoy (E4)	237 yd. (217 m)	133 yd. (122 m)	235 yd. (215 m)	Training: n/a Testing: 600 yd. (549 m)
Signal Underwater Sound (SUS) buoys using >0.5–2.5 lb. NEW	Explosive sonobuoy (E3)	178 yd. (163 m)	92 yd. (84 m)	214 yd. (196 m)	Training: 350 yd. (320 m) Testing: 350 yd. (320 m
Mine Countermeasure and Neutralization Activities (positive control)	>0.5 to 2.5 lb NEW (E3)	495 yd. (453 m)	145 yd. (133 m)	373 yd. (341 m)	Training: 400 yd. (336 m) Testing: n/a
Gunnery Exercises – Small- and Medium-Caliber (Surface Target)	25 mm projectile (E1)	72 yd. (66 m)	48 yd. (44 m)	73 yd. (67 m)	Training: 200 yd. (183 m) Testing: n/a
Gunnery Exercises – Large-Caliber (Surface Target)	5 in. projectiles (E5 at the surface) [3]	210 yd. (192 m)	110 yd. (101 m)	177 yd. (162 m)	Training: 600 yd. (549 m) Testing: n/a
Missile Exercises up to 500 lb. NEW (Surface Target)	Harpoon missile (E10)	1,164 yd. (1,065 m)	502 yd. (459 m)	955 yd. (873 m)	Training: 2,000 yd. (1.8 km) Testing: n/a
Bombing Exercises	MK-84 2,000 lb. bomb (E12)	1,374 yd. (1,256 m)	591 yd. (540 m)	1,368 yd. (1,251 m)	Training: 2,500 yd. (2.3 km) Testing: n/a

Lightweight Torpedo (Explosive) Testing	MK-46 torpedo (E8)	497 yd. (454 m)	245 yd. (224 m)	465 yd. (425 m)	Training: n/a Testing: 2,100 yd. (1.9 km)
Heavyweight Torpedo (Explosive) Testing	MK-48 torpedo (E11)	1,012 yd. (926 m)	472 yd. (432 m)	885 yd. (809 m)	Training: n/a Testing: 2,100 yd. (1.9 km)

[1] This table does not provide an inclusive list of source bins; bins presented here represent the source bin with the largest range to effects within the given activity category.
[2] High-frequency and non-hull-mounted mid-frequency active sonar category includes unmanned underwater vehicle and torpedo testing activities.
[3] The representative source Bin E5 has different range to effects depending on the depth of activity occurrence (at the surface or at various depths).
Notes: ASW = anti-submarine warfare, in. = inch, km = kilometer, m = meter, mm = millimeter, n/a = Not Applicable, NEW = net explosive weight, PTS = permanent threshold shift, TTS = temporary threshold shift, yd. = yard

Consideration of Time/Area Limitations

Area-Specific Mitigation

The Navy has previously placed certain voluntary limitations on their activities in Puget Sound and coastal areas. These limitations have been incorporated into the final rule.

Puget Sound

MFAS Training: Currently, the Navy is not conducting nor is it proposing to conduct training with mid-frequency active hull-mounted sonar on vessels while underway in Puget Sound and the Strait of Juan de Fuca. The Navy's process since 2003 requires approval prior to operating mid-frequency active hull-mounted sonar in Puget Sound and the Strait of Juan de Fuca. The Navy will continue the permission and approval process, in place since 2003, through U.S. Pacific Fleet's designated authority for all mid-frequency active hull-mounted sonar on vessels while training underway in Puget Sound and Strait of Juan de Fuca.

Pierside Maintenance/Testing of Sonar Systems: Pierside maintenance and testing of sonar systems within Puget Sound and the Strait of Juan de Fuca will also require approval by U.S. Pacific Fleet's designated authority or System Command designated

authority as applicable and must be conducted in accordance with Navy's Protective Measures Assessment Protocol (PMAP) for ship and submarine active sonar use, to include use of lookouts. Use of active sonar for anti-terrorism force protection or for safe navigation within the Puget Sound or Strait of Juan de Fuca, or for testing activities within the Dabob Bay Range is always permitted for safety of ship/national security reasons. This scheme has been functioning appropriately since 2003 and there has been, as reflected in annual reports submitted to NMFS for the Northwest Training Range Complex, limited active sonar use for maintenance and testing across Puget Sound and no use for training purposes has been approved in that timeframe.

Civilian Port Defense Exercise (Maritime Homeland Defense/Security Mine Countermeasure Exercise): Prior to Maritime Homeland Defense/Security Mine Countermeasure Integrated Exercises, the Navy will conduct pre-event planning and training to ensure environmental awareness of all exercise participants. When this event is proposed to be conducted in Puget Sound, Navy event planners will consult with Navy biologists who will contact NMFS (Protected Resources Division, West Coast Marine Species Branch Chief) during the planning process in order to determine likelihood of gray whale or southern resident killer whale presence in the proposed exercise area as planners consider specifics of the event.

Non-Explosive Gunnery Exercises: One gunnery exercise, Small Boat Attack, involves only blank rounds and no targets. However, because of the exercise location in Puget Sound, prior to Small Boat Attack training, the Navy will conduct pre-event planning and training to ensure environmental awareness of all exercise participants. When this event is proposed to be conducted in and around Naval Station Everett, Naval Base Kitsap Bangor, or Naval Base

Kitsap Bremerton in Puget Sound, Navy event planners will consult with Navy biologists who will contact NMFS early in the planning process in order to determine the extent marine mammals may be present in the immediate vicinity of proposed exercise area as planners consider the specifics of the event.

Mine Neutralization: The Navy conducts Explosive Ordnance Disposal (EOD) Mine Neutralization events in only two designated locations within the Inland Waters of the NWTT Study Area. A process has been in place requiring approval from U.S. Third Fleet prior to conducting EOD underwater detonations. The Navy will continue the permission and approval process through U.S. Third Fleet for in-water explosives training conducted at Hood Canal or Crescent Harbor.

Coastal Areas

The Navy will conduct Missile Exercises using high explosives at least 50 nm from shore in the NWTRC Offshore Area. The Navy will conduct BOMBEX (high explosive munitions) events at least 50 nm from shore, and will conduct BOMBEX (non-explosive practice munitions) events at least 20 nm from shore.

Feeding and Migration Areas

The Navy's and NMFS' analysis of effects to marine mammals considers emergent science regarding locations where cetaceans are known to engage in specific activities (e.g., feeding, breeding/calving, or migration) at certain times of the year that are important to individual animals as well as populations of marine mammals (see discussion in Van Parijs, 2015). Where data were available, Van Parijs (2015) identified areas that are important in this way and named the areas Biologically Important Area (BIA). It is important to note that the BIAs were not meant to define exclusionary zones,

nor were they meant to be locations that serve as sanctuaries from human activity, or areas analogous to marine protected areas (see Ferguson *et al*. (2015a) regarding the envisioned purpose for the BIA designations). The delineation of BIAs does not have direct or immediate regulatory consequences, although it is appropriate to consider them as part of the body of science that may inform mitigation decisions, depending on the circumstances. The intention was that the BIAs would serve as resource management tools and that their boundaries be dynamic and considered along with any new information as well as, "existing density estimates, range-wide distribution data, information on population trends and life history parameters, known threats to the population, and other relevant information" (Van Parijs, 2015).

The Navy and NMFS have supported and will continue to support the Cetacean and Sound Mapping project, including providing representation on the Cetacean Density and Distribution Mapping Working Group (CetMap) developing the BIAs, which informed NMFS' identification of BIAs. The same marine mammal density data present in the Navy's Density Database Technical Report (U.S. Department of the Navy, 2014) and used in the analysis for the NWTT FEIS/OEIS and this rule were used in the development of BIAs. The final products, including U.S. West Coast BIAs, from this mapping effort were completed and published in March 2015 (Aquatic Mammals, 2015; Calambokidis *et al*., 2015; Ferguson *et al*., 2015a, 2015b; Van Parijs, 2015). 131 BIAs for 24 marine mammal species, stocks, or populations in seven regions within U.S. waters were identified (Ferguson *et al*., 2015a). BIAs in the West Coast of the continental U.S. with the potential to overlap portions of the Study Area include the following feeding and migration areas: Northern Puget Sound Feeding Area for gray

whales (March-May); Northwest Feeding Area for gray whales (May-November); Northbound Migration Phase A for gray whales (January-July); Northbound Migration Phase B for gray whales (March-July); Northern Washington Feeding Area for humpback whales (May-November); Stonewall and Heceta Bank Feeding Area for humpback whales (May-November); and Point St. George Feeding Area for humpback whales (July-November) (Calambokidis *et al*., 2015).

NMFS' Office of Protected Resources routinely considers available information about marine mammal habitat use to inform discussions with applicants regarding potential spatio-temporal limitations on their activities that might help effect the least practicable adverse impact on species or stocks and their habitat. BIAs are useful tools for planning and impact assessments and are being provided to the public via this website: *www.cetsound.noaa.gov*. While these BIAs are useful tools for analysts, any decisions regarding protective measures based on these areas must go through the normal MMPA evaluation process (or any other statutory process that the BIAs are used to inform); the designation of a BIA does not pre-suppose any specific management decision associated with those areas, nor does it have direct or immediate regulatory consequences.

During the April 2014 annual adaptive management meeting in Washington, D.C., NMFS and the Navy discussed the BIAs that might overlap with portions of the NWTT Study Area, what Navy activities take place in these areas (in the context of what their effects on marine mammals might be or whether additional mitigation might be necessary), and what measures could be implemented to reduce impacts in these areas (in the context of their potential to reduce marine mammal impacts and their practicability).

Upon request by NMFS the Navy prepared an assessment of these BIAs, including the degree of spatial overlap of their action areas and activities as well as an analysis of potential impacts or lack of impacts for each BIA. The Navy determined that there was some very limited, to no direct spatial overlap with the marine mammal feeding and migration areas for the majority of the NWTT Study Area (as depicted in Figures 3.4-2 – 3.4-4 of the NWTT FEIS/OEIS). There is even less overlap with the actual training and testing activities based on historical training and testing profiles. The majority of overlap involves vessel transit activity rather than actual acoustic training and testing activities. The following paragraphs go into more detail on the spatial and activity overlap with marine mammal feeding and migration areas.

Spatial Overlap of NWTT Study Area and BIAs

Gray whale areas: There is no direct spatial overlap between the Study Area and four of the offshore gray whale feeding areas – Grays Harbor, WA; Depoe Bay, OR; Cape Blanco and Orford Reef, OR; and Pt. St. George, CA. The NWTT Study Area does overlap with the newly designated offshore gray whale Northwest WA feeding area and the Northern Puget Sound gray whale feeding area. There is no overlap of the gray whale migrations corridor(s) and the NWTT Study Area, with the exception of a portion of the NW coast of Washington approximately from Pacific Beach (WA) and extending north to the Strait of Juan de Fuca.

Humpback whale areas: The offshore Northern WA humpback whale feeding area is located entirely within the Study Area boundaries. The humpback whale feeding area at Stonewall and Hecta Bank only partially overlaps with the Study Area, and the feeding area at Point St. George has extremely limited overlap with the Study Area.

Training and Testing Activity Overlap

Gray whale areas: The gray whale NW Washington feeding area abuts to the shoreline of the NW coast of WA and lies adjacent to the main shipping channel between the Strait of Juan de Fuca and the Pacific Ocean. There is a small likelihood of Navy vessel movement in the gray whale feeding area mapped along the northern coast of Washington as ships transit to the offshore training and testing areas. Based on approximate historically used locations and the proposed training and testing activities described in the NWTT FEIS/OEIS, there is no direct spatial overlap of any training or testing activities within this feeding area. The majority of activities occur greater than 12 nm offshore, thus significantly reducing the potential for overlap. Furthermore, the Navy's LOA request describes mitigation measures that it will implement to avoid vessel strikes, such as continuing to use extreme caution and a safe speed when transiting, maneuvering to keep at least 500 yards from whales observed in a vessel's path, and not approaching whales head-on, provided it is safe to do so. The Navy will also be required to report any vessel strike. The Navy and NMFS concluded that these mitigation measures in addition to historical training and testing profiles indicate that additional mitigations are not warranted for this feeding area.

Vessel movement associated with both training and testing activities is likely to occur within the gray whale feeding area in Northern Puget Sound. Navy ships cannot avoid transiting through this area in order to exit the Puget Sound. Figure 3.0-5 in the NWTT FEIS/OIES depicts average ship traffic density within the major shipping routes within the Pacific Northwest. Overall vessel traffic near Everett, whose port is within or adjacent to the Northern Puget Sound feeding area, is relatively low compared to other

inland water areas. The Navy's proportion of the total vessel traffic is extremely minimal with only 6 surface ships homeported at Naval Station Everett. Therefore, while there is overlap, the potential for Navy vessels to interact with feeding gray whales within this area is low, especially given the short time period (March – May) that whales will be present. The Navy's request describes mitigation measures that it will implement to avoid vessel strikes, such as continuing to use extreme caution and a safe speed when transiting, maneuvering to keep at least 500 yards from whales observed in a vessel's path, and not approaching whales head-on, provided it is safe to do so. The Navy will also be required to report any vessel strike. (Note that the Navy does not find vessel strikes likely to occur given there is no recorded occurrence of vessel strike of any species of marine mammal, including gray whales, by Navy ships during training or testing in the Northwest).

The following training and testing activities occur at Naval Station Everett which appears to be located within the Northern Puget Sound gray whale feeding area; annual pierside sonar maintenance training, annual life-cycle hull-mounted sonar testing, and Maritime Homeland Defense/Security Mine Countermeasure exercises which could occur once every other year (3 events out of 5 years). Acoustic emissions would propagate into this feeding area from these activities. However it is highly unlikely that gray whales would be within the vicinity of the piers or the shorelines around Naval Station Everett based on historical data of their presence (Calambokidis *et al*., 2015). In the case of Maritime Homeland Defense/Security Mine Countermeasure exercises, acoustic emissions would be very infrequent, transitory, and happen with a high degree of temporal variability; activities would occur for a limited time (less than 2 weeks) and

generally utilize HF and VHF active sonar for mine detection that operates outside of the functional hearing and vocalization range for mysticetes, and has less acoustic energy and shorter propagation distances. Based on the acoustic modeling potentially one gray whale take by TTS could occur from the activities at Naval Station Everett. However, since the scheduling of these activities is dependent upon deployment cycles and maintenance schedules the activities may not occur during periods when gray whales are present within this area for feeding. Further, Navy mitigation measures for acoustic activities include avoiding the conduct of acoustic and explosive activities in the immediate vicinity of all marine mammals, including gray whales, and include power down and shutdown procedures to reduce the potential for exposures to whales from sonar events.

Given this area's location in Puget Sound, the vast majority of sound and disturbance in the area will be the result of non-Navy vessel traffic. As such, precluding Navy activity at Naval Station Everett and in Northern Puget Sound would be of little to no biological benefit to the gray whales. Furthermore, given pending overseas deployment needs and individual ship readiness cycles to support those deployments, the time of year when maintenance occurs cannot be proscribed. As for the Maritime Homeland Defense exercise, the location in which it would occur provides realistic conditions necessary to effectively train personnel to protect a major port and the vital assets (ships, cargo) and shipping channels near those ports. This training event, which may include a pierside component, cannot be relocated without losing realism given the ships/cargo and transit lanes requiring protection are in fixed locations. Moreover, as described in the area-specific mitigation section above, the Navy will require approval

from designated authorities prior to conducting mine countermeasure and neutralization underwater detonations at Hood Canal or Crescent Harbor, hull-mounted mid-frequency active sonar training on vessels while underway in Puget Sound and the Strat of Juan de Fuca, and pierside maintenance or testing in Puget Sound or the Strait of Juan de Fuca. In summary, the Navy and NMFS conclude that seasonal avoidance of the use of acoustic sources within the Northern Puget Sound feeding area is unlikely to further reduce impacts to gray whales in this area which are already estimated to be extremely low (i.e. one Level B TTS take) and would negatively impact readiness in a significant manner.

The Navy acknowledges that gray whales migrate along the entire western coast of the United States, typically within 15 nm of the shore in the NWTT Study Area, but possibly anywhere over the continental shelf, and that a small subset of the gray whale population may enter Puget Sound during their migrations. Vessel movement associated with virtually all of the training and testing activities proposed in the NWTT FEIS/OEIS will occur and has been occurring in areas potentially used by migrating gray whales for decades; however, the majority of the Navy's vessel traffic and training and testing occur outside the 12 nm line, thus significantly reducing the overlap, since the gray whale migration areas only extend 10 nm offshore. Navy vessels are not the only vessel traffic that these migrating whales may encounter as Navy vessels represent a small fraction of total vessel traffic within the Greater Puget Sound and offshore areas (see Figure 3.0-5 of the NWTT FEIS/OIS). The Figure shows little correlation of impedance or interference to gray whale migration in areas where Navy vessels transit and training and testing activities have historically occurred or are expected to continue into the reasonably foreseeable future in the NWTT Study Area. In fact, with the shipping density data

overlapped, it is evident that while shipping traffic is heavy into the Strait of Juan de Fuca, as well as within the shipping lanes of Puget Sound, this traffic does not restrict or interfere with the annual north and south bound migration of gray whales nor their movements in Puget Sound. Some training and most testing activities will include acoustic emissions within or propagating into areas potentially used by migrating gray whales. However, these activities may not always be timed during periods in which the gray whales are present. The Navy has requested a small number of Level B (behavioral) gray whale takes for all activities occurring within the offshore NWTT Study Area. As described in the Navy's LOA application and this final rule, the Navy is seeking authorization for 17 Level B (TTS) takes of gray whales annually (6 from training activities and 11 from testing activities) from activities occurring throughout the offshore Study Area. The Navy's LOA request describes mitigation measures that it will implement to avoid vessel strikes, such as continuing to use extreme caution and a safe speed when transiting, maneuvering to keep at least 500 yards from whales observed in a vessel's path, and not approaching whales head-on, provided it is safe to do so. The Navy will also be required to report any vessel strike. However, the Navy does not find vessel strikes likely to occur given there is no recorded occurrence of vessel strike of any species of marine mammal, including gray whales, by Navy ships during training or testing in the Northwest. Navy mitigation measures for acoustic activities also include avoiding the conduct of acoustic and explosive activities in the immediate vicinity of all marine mammals, including gray whales. Further, as described in the area-specific mitigation section above, the Navy will require approval from designated authorities prior to conducting mine countermeasure and neutralization underwater detonations at Hood

Canal or Crescent Harbor, hull-mounted mid-frequency active sonar training on vessels while underway in Puget Sound and the Strat of Juan de Fuca, and pierside maintenance or testing in Puget Sound or the Strait of Juan de Fuca. The Navy and NMFS concluded that based on the mitigations in place, historical training and testing profiles, limited estimated effects, and no evidence of ship strikes to migrating gray whales within the Study area that no additional mitigations are warranted in the gray whale migration areas.

Humpback whale areas: Vessel movement is likely to occur in at least some of the humpback whale BIAs, including the designated humpback whale feeding area mapped at the mouth of the Strait of Juan de Fuca. Historical ship density (majority of which is non-Navy vessels) depicted in Figure 3.0-5 of the NWTT FEIS/OEIS is high in the Northern Washington humpback whale feeding area. However, Navy vessel traffic is extremely minimal in comparison to commercial ship traffic, with typically only 20 ships and submarines homeported in the Puget Sound region. Therefore, Navy vessel traffic is low within this feeding area. There is an extremely low likelihood of any Navy vessel movements occurring within the two southern humpback whale feeding areas, especially given that the Point St. George feeding area only overlaps the very eastern boundary of the Study Area. The Navy's LOA request describes mitigation measures that it will implement to avoid vessel strikes, such as continuing to use extreme caution and a safe speed when transiting, maneuvering to keep at least 500 yards from whales observed in a vessel's path, and not approaching whales head-on, provided it is safe to do so. The Navy will also be required to report any vessel strike. (Note that neither the Navy nor NMFS find vessel strikes likely to occur given there is no recorded occurrence of vessel

strike of any species of marine mammal, including gray whales, by Navy ships during training or testing in the Northwest).

Based on a review of the historic activity profiles and the proposed training activities described in the NWTT FEIS/OEIS, there would be no direct spatial overlap of training activities with any designated feeding areas for humpbacks in the offshore portion of the NWTT Study Area. There is a generally low probability of potential acoustic overlap with the specifically identified feeding areas. Any propagation of sound from training activities into the Northern Washington humpback whale feeding area would mostly likely result from hull-mounted sonar maintenance or systems checks as vessels are transiting to other areas within and outside of the NWTT Study Area. The Navy estimates very low impacts to humpback whales from offshore training activities involving sonar, and no impacts from any explosive events. Only 12 total Level B (7 behavioral, 5 TTS) takes of humpback whales are anticipated annually from all training activities combined occurring within the offshore Study Area, not just those areas overlapping with the feeding areas. Requiring Navy vessels to avoid this feeding area and utilize acoustic systems further offshore would position ships into higher dense traffic waters based on commercial shipping density data in that area. In addition to the fact that avoidance would not be expected to notably reduce takes, avoidance of these feeding areas during Navy training could create safety concerns by forcing the Navy to delay maintenance and systems checks until ships are farther from shore and homeport infrastructure that could have assisted in addressing potential technical issues.

For testing activities, there is a chance that countermeasure testing could propagate non-impulsive sound into the Northern Washington humpback whale feeding

area adjacent to the Strait of Juan de Fuca. These testing activities would be transitory, last from three to eight hours, and are conducted sporadically in any given geographic location. These countermeasure testing activities may be scheduled for any time of year based upon the availability of assets (ships and/or aircraft) needed to support the tests. Though the Navy does not expect to conduct tests within this feeding area, it would be difficult to ensure that all countermeasure testing was conducted far enough from the site to avoid sound propagation into it since some countermeasure devices propagate mid-frequency sound a long distance, so it is possible that some amount of sound from these measures conducted outside of the area may propagate into the feeding area some limited number of times. Conducting this testing further from port and from support facilities would increase event costs, time, and fuel required to complete them, as well as limit available sites suitable to support the testing requirements and limit Navy's use of the existing Quinault Range Site. Avoidance of this area would negatively impact readiness, while likely only providing a small potential reduction in marine mammal sound exposure.

Occasional shallow water testing with sonobuoys would overlap the Stonewall and Heceta Bank humpback whale feeding area offshore of Oregon. The shallow water features in the area affect bottom reflecting, scattering, and absorption of the sound and typically create a more challenging environment to test sonobuoys in due to other surface sound sources (commercial/recreational boats). These conditions allow aircrews to gain understanding of how noise from other sources will impact underwater signal detection. However, these sonobuoy testing events are infrequent (fewer than 50 per year) and of short-duration (less than a day). These events occur sporadically throughout the year and

will not necessarily occur during time periods of humpback whale feeding. It is unlikely that this limited testing of sonobuoys would have any biologically meaningful effect on humpback whale feeding behavior in this area; however, avoidance of this area would negatively impact readiness. The Navy estimates very low impacts to humpback whales from offshore testing activities involving sonar and no impacts from explosive testing. Only 45 Level B (6 behavioral, 39 TTS) takes of humpback whales are anticipated annually from all testing activities occurring within the offshore Study Area, not just those areas overlapping with the feeding areas. Based on the Navy's existing mitigation measures for these activities, the low numbers of potential take to all humpback whales not just those within the feeding areas, the lack of prior ship strikes of humpback whales within the Study Area, and the impacts to readiness from avoiding or relocating activities the Navy and NMFS conclude that further mitigation within the humpback whale feeding areas is not warranted.

In summary, the Navy's and NMFS' analysis indicates that there is generally low use of the BIAs and the modeling supports that there are limited impacts to gray whales and humpbacks throughout the entire NWTT study area. There is the potential for the most overlap between Navy activities within the following threes feeding areas – the Humpback Whale Northern Washington feeding area, Stonewall Heceta Bank feeding area, and the Gray Whale Northern Puget Sound feeding area. Very few takes are expected to result from activities within these feeding areas, and the nature of these activities along with the required mitigation measures would result in the least practicable adverse impacts on the species and their habitat. However, the Navy has agreed to monitor, and provide NMFS with reports of, hull-mounted mid-frequency and high

frequency active sonar use during training and testing in the months specified in the following three feeding areas to the extent that active sonar training or testing does occur in these feeding areas: Humpback Whale Northern Washington feeding area (May through November); Stonewall and Heceta Bank feeding area (May through November) and Gray Whale Northern Puget Sound Feeding Area (March through May). The Navy will provide this information annually in the classified exercise report to the extent sonar use in those areas can be distinguished from data retrieved in Navy's system. The intent would be to inform future adaptive management discussions about future mitigation adjustments should sonar use increase above the existing low use/low overlap description provided by the Navy or if new science provides a biological basis for increased protective measures.

If additional biologically important areas are identified by NMFS after finalization of this rule and the Navy's NWTT FEIS/OEIS, the Navy and NMFS will use the Adaptive Management process to assess whether any additional mitigation should be considered in those areas. Results of the species-specific assessment of potential impacts to humpback and gray whales in their respective BIAs within the Study Area are included in Chapter 3.4.3 and Chapter 5.3.4.1.11 of the NWTT FEIS/OEIS and in the Species/Group Specific Analysis below. As we learn more about marine mammal density, distribution, and habitat use (and the BIAs are updated), NMFS and the Navy will continue to reevaluate appropriate time-area measures through the Adaptive Management process outlined in these regulations.

Marine Protected Areas

Marine protected areas (MPAs) in the National System of MPAs potentially occurring within the Study Area are listed and described in Section 6.1.2 of the NWTT FEIS/OEIS (Marine Protected Areas, Table 6.1-2). As shown in Figure 6.1-1 of the NWTT FEIS/OEIS, proposed Navy training and testing activities in the Study Area do not overlap these MPAs (with the exception of the Olympic Coast National Marine Sanctuary (OCNMS), discussed below). The NWTT FEIS/OEIS has been prepared in accordance with the requirements to avoid harm to the natural and cultural resources of existing National System MPAs. Navy activities, should they occur within or near a MPA, would fully abide by the regulations of the individual MPA (see Table 6.1-2 of the NWTT FEIS/OEIS for information See Section 6.1.2 of the NWTT FEIS/OEIS (Marine Protected Areas) for more information.

Olympic Coast National Marine Sanctuary

To the extent practicable, the Navy currently avoids conducting activities within the OCNMS, and expects this practice to continue. However, some Navy NWTT activities may occur within the OCNMS. The Navy has been conducting training and testing offshore of the coast of Washington for decades. The area provides variable bathymetries, and training and testing challenges to simulate potential operational scenarios. There is relatively small spatial overlap between the NWTT Offshore Area and the OCNMS. For training activities occurring in the Offshore Area, less than 3% would be expected to occur within the OCNMS. Most training events would occur outside the boundaries of the OCNMS. Although the Navy is specifically authorized to conduct certain activities within the OCNMS, the Navy currently conducts very limited training within the OCNMS and does not use explosives within the OCNMS. Non-

explosive bombing exercises will also not occur in the OCNMS. The Navy expects this level and type of activity to continue into the reasonably foreseeable future.

While active sonar and ASW activities are authorized within the OCNMS, the Navy uses its Protective Measures Assessment Protocol (PMAP) program to inform all users of active sonar that the OCNMS is within the NWTT Study Area. PMAP informs users that no high explosives are authorized in the OCNMS. The Navy proposes to continue use of PMAP in this manner for awareness and notification. The Navy has also agreed to monitor, and provide NMFS with reports of, hull-mounted mid-frequency and high-frequency active sonar use during training and testing in the OCNMS.

Federal agency actions that are likely to injure sanctuary resources are subject to consultation with the NOAA Office of National Marine Sanctuaries (ONMS) under section 304(d) of the National Marine Sanctuaries Act (NMSA). The Navy and NMFS initiated joint consultation with ONMS through the submittal of a Sanctuary Resource Statement (SRS) on September 8, 2015. Within the Navy's SRS, only a subset of NWTT activities, primarily non-impulsive testing events, were identified as possibly occurring routinely within OCNMS because of the existing Quinault Range which overlaps portions of OCNMS. Furthermore, these events would be spatially and temporarily separated throughout the year as well as from any preceding event. ONMS provided recommended alternatives to the Navy and NMFS to further protect sanctuary resources on October 23, 2015. On November 9, 2015, the Navy and NMFS jointly responded in writing to each of the ONMS recommendations.

Notification of Marine Mammal Stranding

Navy personnel shall ensure that NMFS is notified immediately (or as soon as clearance procedures allow) if a stranded marine mammal is found during or shortly after, and in the vicinity of, any Navy training exercise utilizing MFAS, HFAS, or underwater explosive detonations. See *General Notification of Injured or Dead Marine Mammals* in the Reporting section below for details on the communication and reporting requirements if a marine mammal stranding is observed.

Mitigation Conclusions

NMFS has carefully evaluated the Navy's proposed mitigation measures – many of which were developed with NMFS' input during the first phase of Navy Training and Testing authorizations – and considered a range of other measures in the context of ensuring that NMFS prescribes the means of effecting the least practicable adverse impact on the affected marine mammal species and stocks and their habitat. Based on our evaluation of the Navy's proposed measures, as well as other measures considered by NMFS, NMFS has determined that the Navy's proposed mitigation measures (especially when the adaptive management component is taken into consideration (see Adaptive Management, below)) are adequate means of effecting the least practicable adverse impacts on marine mammals species or stocks and their habitat, paying particular attention to rookeries, mating grounds, and areas of similar significance, while also considering personnel safety, practicality of implementation, and impact on the effectiveness of the military readiness activity.

Monitoring

Section 101(a)(5)(A) of the MMPA states that in order to issue an ITA for an activity, NMFS must set forth "requirements pertaining to the monitoring and reporting

of such taking." The MMPA implementing regulations at 50 CFR 216.104 (a)(13) indicate that requests for LOAs must include the suggested means of accomplishing the necessary monitoring and reporting that will result in increased knowledge of the species and of the level of taking or impacts on populations of marine mammals that are expected to be present.

Integrated Comprehensive Monitoring Program (ICMP)

The Navy's ICMP is intended to coordinate monitoring efforts across all regions and to allocate the most appropriate level and type of effort for each range complex based on a set of standardized objectives, and in acknowledgement of regional expertise and resource availability. The ICMP is designed to be flexible, scalable, and adaptable through the adaptive management and strategic planning processes to periodically assess progress and reevaluate objectives. Although the ICMP does not specify actual monitoring field work or projects, it does establish top-level goals that have been developed in coordination with NMFS. As the ICMP is implemented, detailed and specific studies will be developed which support the Navy's top-level monitoring goals. In essence, the ICMP directs that monitoring activities relating to the effects of Navy training and testing activities on marine species should be designed to contribute towards one or more of the following top-level goals:

- An increase in our understanding of the likely occurrence of marine mammals and/or ESA-listed marine species in the vicinity of the action (i.e., presence, abundance, distribution, and/or density of species);

- An increase in our understanding of the nature, scope, or context of the likely exposure of marine mammals and/or ESA-listed species to any of the potential

stressor(s) associated with the action (e.g., tonal and impulsive sound), through better understanding of one or more of the following: (1) the action and the environment in which it occurs (e.g., sound source characterization, propagation, and ambient noise levels); (2) the affected species (e.g., life history or dive patterns); (3) the likely co-occurrence of marine mammals and/or ESA-listed marine species with the action (in whole or part) associated with specific adverse effects, and/or; (4) the likely biological or behavioral context of exposure to the stressor for the marine mammal and/or ESA-listed marine species (e.g., age class of exposed animals or known pupping, calving or feeding areas);

- An increase in our understanding of how individual marine mammals or ESA-listed marine species respond (behaviorally or physiologically) to the specific stressors associated with the action (in specific contexts, where possible, e.g., at what distance or received level);

- An increase in our understanding of the impacts of the activity on marine mammal or ESA-listed species habitat;

- An increase in our understanding of how anticipated individual responses to individual stressors or anticipated combinations of stressors, and/or impacts to habitat, may impact either: (1) the long-term fitness and survival of an individual; or (2) the population, species, or stock (e.g., through effects on annual rates of recruitment or survival);

- An increase in our understanding of the effectiveness of mitigation and monitoring measures;

- A better understanding and record of the manner in which the authorized entity complies with the ITA and Incidental Take Statement;
- An increase in the probability of detecting marine mammals (through improved technology or methods), both specifically within the safety zone (thus allowing for more effective implementation of the mitigation) and in general, to better achieve the above goals; and
- A reduction in the adverse impact of activities to further achieve the least practicable level, as defined in the MMPA.

Monitoring would address the ICMP top-level goals through a collection of specific regional and ocean basin studies based on scientific objectives. Quantitative metrics of monitoring effort (e.g., 20 days of aerial surveys) would not be a specific requirement. The adaptive management process and reporting requirements would serve as the basis for evaluating performance and compliance, primarily considering the quality of the work and results produced, as well as peer review and publications, and public dissemination of information, reports, and data. Details of the ICMP are available online (*http://www.navymarinespeciesmonitoring.us/*).

Strategic Planning Process for Marine Species Monitoring

The Navy also developed the Strategic Planning Process for Marine Species Monitoring, which establishes the guidelines and processes necessary to develop, evaluate, and fund individual projects based on objective scientific study questions. The process uses an underlying framework designed around top-level goals, a conceptual framework incorporating a progression of knowledge, and in consultation with a Scientific Advisory Group and other regional experts. The Strategic Planning Process for

Marine Species Monitoring would be used to set intermediate scientific objectives, identify potential species of interest at a regional scale, and evaluate and select specific monitoring projects to fund or continue supporting for a given fiscal year. This process would also address relative investments to different range complexes based on goals across all range complexes, and monitoring would leverage multiple techniques for data acquisition and analysis whenever possible. The Strategic Planning Process for Marine Species Monitoring is also available online (*http://www.navymarinespeciesmonitoring.us/*).

Past Monitoring in the NWTT Study Area

NMFS has received multiple years' worth of annual exercise and monitoring reports addressing active sonar use and explosive detonations within portions of the NWTT Study Area and other Navy range complexes. The data and information contained in these reports have been considered in developing mitigation and monitoring measures for the proposed training and testing activities proposed to occur within the NWTT Study Area. The Navy's annual exercise and monitoring reports may be viewed at: *http://www.nmfs.noaa.gov/pr/permits/incidental/military.htm* and *http://www.navymarinespeciesmonitoring.us*. NMFS' summary of the Navy's annual monitoring reports was included in the proposed rule (80 FR 31738, June 3, 2015; pages 31781-31783).

Other Regional Navy-Funded Monitoring Efforts

Additional marine mammal studies are being funded or conducted by the Navy outside of and in addition to the Navy's commitments in the NWTT Study Area and other Navy range complexes. NMFS' summary of the Navy's other regional monitoring

efforts was included in the proposed rule (80 FR 31738, June 3, 2015; pages 31781-31783).

Proposed Monitoring for the NWTT Study Area

Based on discussions between the Navy and NMFS, future Navy compliance monitoring should address ICMP top-level goals through a series of regional and ocean basin study questions with a prioritization and funding focus on species of interest as identified for each range complex. The ICMP will also address relative investments to different range complexes based on goals across all range complexes, and monitoring will leverage multiple techniques for data acquisition and analysis whenever possible.

Within the NWTT Study Area, the Navy's initial recommendation for species of interest includes blue whale, fin whale, humpback whale, Southern Resident killer whale (offshore portion of their annual movements), and beaked whales. Navy monitoring for NWTT under this LOA authorization and concurrently in other areas of the Pacific Ocean will therefore be structured to address region-specific and species-specific study questions in consultation with NMFS. The following projects will be funded or have been funded to support the NWTT monitoring program:

A. Modeling the Distribution of Southern Resident Killer Whales in the Pacific Northwest

As an early start to NWTT monitoring, in July 2014 the Navy provided funding ($209,000) to NMFS' Northwest Fisheries Science Center (NWFSC) to jointly participate in a new NWTT- specific study: Modeling the distribution of southern resident killer whales in the Pacific Northwest. The goal of this new study is to provide a more scientific understanding of endangered southern resident killer whale winter

distribution off the Pacific Northwest coast. The end product will be a Bayesian space-state model for predicting the offshore winter occurrence of southern resident killer whales. The project will consist of analysis of existing NMFS data (passive acoustic detections, satellite tag tracks) as well as new data collection from fall 2014 through spring 2016, some of which is being accomplished with the Navy's funding. The Navy has also provided NMFS NWFSC funds to support the FY16 fieldwork associated with the larger southern resident killer whale Habitat Model Project to collect biopsy samples, prey remains, fecal, mucus, and regurgitation samples. The goal of this field work is to determine the prey selected by southern resident killer whales throughout their range, but particularly in the coastal waters of the US, mainly from Cape Flattery to the Columbia River).

Details of the study can be found at:

http://www.navymarinespeciesmonitoring.us/regions/pacific/current-projects/.

The main tasks the study supports include:

- Identification and classification of marine mammal detections from acoustic recorders.
- Acquisition and field deployment of satellite-linked transmitters to track and determine southern resident killer whales movements.
- Deployment of autonomous underwater acoustic recorders in and adjacent to the coastal and shelf/slope waters of Washington State. Navy funding will allow 10 additional recorders to be purchased and deployed along with four NMFS recorders for a total of 14 deployed recorders.

- Estimation of the probability of Southern Resident killer whale detection on acoustic recorders.
- Development of the state-space occurrence models.
- Development of predicative maps of the seasonal annual occurrence of southern resident killer whales.
- Development a cost efficient strategy for the deployment of acoustic recorders in and adjacent to Pacific Northwest Navy ranges.
- Reporting.

B. Pacific Northwest Pinniped Satellite Tracking Project

This project began in FY14 and will continue through FY16. Navy provided funding to the Alaska Fisheries Science Center to conduct satellite tagging and behavioral monitoring of sea lions in the Pacific Northwest in proximity to Navy facilities. The goal of the study is to fill in data gaps that exist in identifying the location of local foraging areas and documenting the percentage of time pinniped species are hauled out or utilizing the waters near Puget Sound naval facilities. The objectives of this study include:

- Census data of the adult males that haulout at Naval Station Everett, and Naval Base Kitsap- Bremerton/Bangor to develop minimum population estimates for the inland waters;
- Monthly correction factors from tagging data to correct count data from census locations;
- Geographical distribution and foraging behavior of California sea lion adult males in the inland waters of Washington, specifically relative to Navy installations;

- Migration and foraging behavior of California sea lions in coastal Washington, Oregon, and California.

C. Marine Mammal Aerial Surveys in the Pacific Northwest, Inland Puget Sound Waters

This project began in FY13 and will continue through FY16. The goal of this effort was to fill critical data gaps regarding the current abundance and population status of marine mammal species within the inland waters of Puget Sound and in relation to Navy training and testing locations. The objectives of this task are to:

- Collect data to estimate the abundance and densities of marine mammals in inland waters of Puget Sound;
- Document the distribution, habitat use, and behaviors of each species observed.

A more detailed description of the Navy's planned projects starting in 2015 (and some continuing from previous years) is available at the Navy's Marine Species Monitoring web portal: *http://www.navymarinespeciesmonitoring.us/*. The Navy will update the status of its monitoring program and funded projects through their Marine Species Monitoring web portal.

Ongoing Navy Research

The U.S. Navy is one of the world's leading organizations in assessing the effects of human activities on the marine environment, including marine mammals. From 2004 through 2013, the Navy has funded over $240M specifically for marine mammal research. Navy scientists work cooperatively with other government researchers and scientists, universities, industry, and non-governmental conservation organizations in

collecting, evaluating, and modeling information on marine resources. They also develop approaches to ensure that these resources are minimally impacted by existing and future Navy operations. It is imperative that the Navy's Research and Development (R&D) efforts related to marine mammals are conducted in an open, transparent manner with validated study needs and requirements. The goal of the Navy's R&D program is to enable collection and publication of scientifically valid research as well as development of techniques and tools for Navy, academic, and commercial use. Historically, R&D programs are funded and developed by the Office of the Chief of Naval Operations Energy and Environmental Readiness Division and Office of Naval Research (ONR), Code 322 Marine Mammals and Biological Oceanography Program. Since the 1990s, the primary focus of these programs has been on understanding the effects of sound on marine mammals, including physiological, behavioral and ecological effects. ONR's current Marine Mammals and Biology Program thrusts include, but are not limited to: (1) monitoring and detection research; (2) integrated ecosystem research including sensor and tag development; (3) effects of sound on marine life (such as hearing, behavioral response studies, physiology [diving and stress], and PCAD); and (4) models and databases for environmental compliance.

To manage some of the Navy's marine mammal research programmatic elements, OPNAV N45 developed in 2011 a new Living Marine Resources (LMR) Research and Development Program (*http://www.lmr.navy.mil/*). The goal of the LMR Research and Development Program is to identify and fill knowledge gaps and to demonstrate, validate, and integrate new processes and technologies to minimize potential effects to marine mammals and other marine resources. Key elements of the LMR program include:

- Providing science-based information to support Navy environmental effects assessments for research, development, acquisition, testing, and evaluation as well as Fleet at-sea training, exercises, maintenance, and support activities.
- Improving knowledge of the status and trends of marine species of concern and the ecosystems of which they are a part.
- Developing the scientific basis for the criteria and thresholds to measure the effects of Navy-generated sound.
- Improving understanding of underwater sound and sound field characterization unique to assessing the biological consequences resulting from underwater sound (as opposed to tactical applications of underwater sound or propagation loss modeling for military communications or tactical applications).
- Developing technologies and methods to monitor and, where possible, mitigate biologically significant consequences to living marine resources resulting from naval activities, emphasizing those consequences that are most likely to be biologically significant.

Navy Research and Development

Navy Funded – Both the LMR and ONR R&D programs periodically fund projects within the NWTT Study Area. Some data and results from these R&D projects are summarized in the Navy's annual range complex monitoring reports, and available on NMFS' website (*http://www.nmfs.noaa.gov/pr/permits/incidental/military.htm*) and the Fleet's new marine species monitoring website (*http://www.navymarinespeciesmonitoring.us/regions/pacific/current-projects/*). In addition, the Navy's Range Complex monitoring during training and testing activities is

coordinated with the R&D monitoring in a given region to leverage research objectives, assets, and studies where possible under the ICMP.

The integration between the Navy's new LMR R&D program and related range complex monitoring will continue and improve during the applicable period of the rulemaking with results presented in NWTT annual monitoring reports.

Other National Department of Defense Funded Initiatives – Strategic Environmental Research and Development Program (SERDP) and Environmental Security Technology Certification Program (ESTCP) are the DoD's environmental research programs, harnessing the latest science and technology to improve environmental performance, reduce costs, and enhance and sustain mission capabilities. The Programs respond to environmental technology requirements that are common to all of the military Services, complementing the Services' research programs. SERDP and ESTCP promote partnerships and collaboration among academia, industry, the military Services, and other Federal agencies. They are independent programs managed from a joint office to coordinate the full spectrum of efforts, from basic and applied research to field demonstration and validation.

Adaptive Management

The final regulations governing the take of marine mammals incidental to Navy training and testing activities in the NWTT Study Area contain an adaptive management component carried over from previous authorizations. Although better than 5 years ago, our understanding of the effects of Navy training and testing activities (e.g., MFAS/HFAS, underwater detonations) on marine mammals is still relatively limited, and yet the science in this field is evolving fairly quickly. These circumstances make the

inclusion of an adaptive management component both valuable and necessary within the context of 5-year regulations for activities that have been associated with marine mammal mortality in certain circumstances and locations.

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

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

Reporting

In order to issue an ITA for an activity, section 101(a)(5)(A) of the MMPA states that NMFS must set forth "requirements pertaining to the monitoring and reporting of such taking." Effective reporting is critical both to compliance as well as ensuring that the most value is obtained from the required monitoring. NMFS described the proposed Navy reporting requirements in the proposed rule (80 FR 31738, June 3, 2015; page 31784). Reports from individual monitoring events, results of analyses, publications, and periodic progress reports for specific monitoring projects will be posted to the Navy's Marine Species Monitoring web portal: *http://www.navymarinespeciesmonitoring.us* and NMFS' website: *http://www.nmfs.noaa.gov/pr/permits/incidental/military.htm*. There are several different reporting requirements that are further detailed in the regulatory text at the end of this document and summarized below.

General Notification of Injured or Dead Marine Mammals

Navy personnel would ensure that NMFS (the appropriate Regional Stranding Coordinator) is notified immediately (or as soon as clearance procedures allow) if an injured, stranded, or dead marine mammal is found during or shortly after, and in the vicinity of, any Navy training exercise utilizing MFAS, HFAS, or underwater explosive detonations. The Navy would provide NMFS with species identification or a description of the animal(s), the condition of the animal(s) (including carcass condition if the animal is dead), location, time of first discovery, observed behaviors (if alive), and photographs or video (if available).

Vessel Strike

Since the publication of the proposed rule, NMFS has added the following language to address monitoring and reporting measures specific to vessel strike. Most of

this language comes directly from the Stranding Response Plan for other Navy Phase 2 rulemakings. This section has also been included in the regulatory text at the end of this document. Vessel strike during Navy training and testing activities in the Study Area is not anticipated; however, in the event that a Navy vessel strikes a whale, the Navy shall do the following:

Immediately report to NMFS (pursuant to the established Communication Protocol) the:

- Species identification (if known);
- Location (latitude/longitude) of the animal (or location of the strike if the animal has disappeared);
- Whether the animal is alive or dead (or unknown); and
- The time of the strike.

As soon as feasible, the Navy shall report to or provide to NMFS, the:

- Size, length, and description (critical if species is not known) of animal;
- An estimate of the injury status (e.g., dead, injured but alive, injured and moving, blood or tissue observed in the water, status unknown, disappeared, etc.);
- Description of the behavior of the whale during event, immediately after the strike, and following the strike (until the report is made or the animal is no longer sighted);
- Vessel class/type and operational status;
- Vessel length;
- Vessel speed and heading; and

- To the best extent possible, obtain a photo or video of the struck animal, if the animal is still in view.

Within 2 weeks of the strike, provide NMFS:

- A detailed description of the specific actions of the vessel in the 30-minute timeframe immediately preceding the strike, during the event, and immediately after the strike (e.g., the speed and changes in speed, the direction and changes in direction, other maneuvers, sonar use, etc., if not classified);
- A narrative description of marine mammal sightings during the event and immediately after, and any information as to sightings prior to the strike, if available; and use established Navy shipboard procedures to make a camera available to attempt to capture photographs following a ship strike.

NMFS and the Navy will coordinate to determine the services the Navy may provide to assist NMFS with the investigation of the strike. The response and support activities to be provided by the Navy are dependent on resource availability, must be consistent with military security, and must be logistically feasible without compromising Navy personnel safety. Assistance requested and provided may vary based on distance of strike from shore, the nature of the vessel that hit the whale, available nearby Navy resources, operational and installation commitments, or other factors.

Annual Monitoring Reports

The Navy shall submit an annual report of the NWTT monitoring describing the implementation and results of the NWTT monitoring efforts from the previous calendar year. Data collection methods will be standardized across range complexes and study areas to allow for comparison in different geographic locations. Although additional

information will be gathered, the protected species observers collecting marine mammal data pursuant to the NWTT monitoring plan shall, at a minimum, provide the same marine mammal observation data required in § 218.145. The report shall be submitted either 90 days after the calendar year, or 90 days after the conclusion of the monitoring year to be determined by the Adaptive Management process.

The NWTT Monitoring Report may be provided to NMFS within a larger report that includes the required Monitoring Plan reports from multiple range complexes and study areas (the multi-Range Complex Annual Monitoring Report). Such a report would describe progress of knowledge made with respect to monitoring plan study questions across all Navy ranges associated with the ICMP. Similar study questions shall be treated together so that progress on each topic shall be summarized across all Navy ranges. The report need not include analyses and content that does not provide direct assessment of cumulative progress on the monitoring plan study questions.

Annual Exercise and Testing Reports

The Navy shall submit preliminary reports detailing the status of authorized sound sources within 21 days after the anniversary of the date of issuance of the LOA. The Navy shall submit detailed reports 3 months after the annual anniversary of the date of issuance of the LOA. The detailed annual reports shall describe the level of training and testing conducted during the reporting period, and a summary of sound sources used (total annual hours or quantity [per the LOA] of each bin of sonar or other non-impulsive source; total annual number of each type of explosive exercises; total annual expended/detonated rounds [missiles, bombs, etc.] for each explosive bin; and improved Extended Echo-Ranging System (IEER)/sonobuoy summary, including total number of

IEER events conducted in the Study Area, total expended/detonated rounds (buoys), and total number of self-scuttled IEER rounds. The analysis in the detailed reports will be based on the accumulation of data from the current year's report and data collected from previous reports.

The annual classified exercise reports will also include the amount of hull-mounted mid-frequency and high frequency active sonar use during training and testing activities in the OCNMS and in the months specified for the following three feeding areas (to the extent that active sonar training or testing does occur in these areas): the Humpback Whale Northern Washington feeding area (May through November); the Stonewall and Heceta Bank feeding area (May through November) and the Gray Whale Northern Puget Sound Feeding Area (March through May).

5-year Close-out Exercise and Testing Report

This report will be included as part of the 2020 annual exercise or testing report. This report will provide the annual totals for each sound source bin with a comparison to the annual allowance and the 5-year total for each sound source bin with a comparison to the 5-year allowance. Additionally, if there were any changes to the sound source allowance, this report will include a discussion of why the change was made and include the analysis to support how the change did or did not result in a change in the EIS and final rule determinations. The report will be submitted 3 months after the expiration of the rule. NMFS will submit comments on the draft close-out report, if any, within 3 months of receipt. The report will be considered final after the Navy has addressed NMFS' comments, or 3 months after the submittal of the draft if NMFS does not provide comments.

Comments and Responses

On June 3, 2015 (80 FR 31738), NMFS published a proposed rule in response to the Navy's request to take marine mammals incidental to training and testing activities in the NWTT Study Area and requested comments, information, and suggestions concerning the request. During the 45-day public comment period, NMFS received over 100 comments (including several duplicates) from the Marine Mammal Commission (Commission), non-governmental organizations, Tribes, and private citizens. Comments were collectively submitted in a letter on behalf of the Animal Legal Defense Fund, Animal Welfare Institute, Center for Biological Diversity, Earthjustice, Environmental Protection Information Center, Friends of the Earth, Friends of the San Juans, The Humane Society of the United States, InterTribal Sinkyone Wilderness Council, Klamath Forest Alliance, Natural Resources Defense Council, New York Whale and Dolphin Action League, Northcoast Environmental Center, Ocean Mammal Institute, Orca Network, Surfrider Foundation -Mendocino Coast Chapter, Carol Van Strum, and the Whale and Dolphin Conservation (hereinafter referred to as Animal Legal Defense Fund *et al*.). Comments specific to section 101(a)(5)(A) of the MMPA and NMFS' analysis of impacts to marine mammals are summarized, sorted into general topic areas, and addressed below and/or throughout the final rule. Comments specific to the NWTT FEIS/OEIS, which NMFS participated in developing as a cooperating agency and adopted, or that were also submitted to the Navy during the NWTT DEIS/OEIS public comment period are addressed in Appendix E (Public Participation) of the NWTT FEIS/OEIS. Some commenters presented technical comments on the general behavioral risk function that are largely identical to those posed during the comment period for

proposed rules for the Atlantic Fleet Training and Testing (AFTT), Hawaii-Southern California Training and Testing (HSTT), and Mariana Islands Training and Testing (MITT) study areas, predecessors to the NWTT rule. The behavioral risk function remains unchanged since then, and here we incorporate our responses to those initial technical comments (78 FR 73010, Acoustic Thresholds, page 73038; 78 FR 78106, Acoustic Thresholds, page 78129; 80 FR 46112, Criteria and Thresholds, page 46146). Full copies of the comment letters may be accessed at *http://www.regulations.gov*.

Activity

Comment 1: The Animal Legal Defense Fund *et al.* commented that the Navy's training and testing activities and resulting takes are "a picture of harm that exceeds anything the Navy has proposed for the area in the past." The commenters further expressed particular concerns for southern resident killer whales, blue whales, fin whales, harbor porpoises, and beaked whales.

Response: The Navy has been conducting largely the same training and testing activities using the same type of equipment in the NWTT Study Area for decades without any evidence of harm to marine species as a result of those activities. The takes authorized by this rule are comparable to what is currently authorized for the same training and testing activities that have been occurring for decades in the NWTT Study Area, and are less than what is authorized in other Navy training and testing areas (e.g., AFTT, HSTT). In particular, see Section 3.4.4.1 of the NWTT FEIS/OEIS (Summary of Monitoring and Observations During Navy Activities) and the Long Term Consequences section of this rule regarding the likely long-term consequences from those activities. Also note that as described in Section 1.9 of the NWTT FEIS/OEIS, previous analyses

have taken place regarding a comprehensive understanding of Navy activities in the Pacific Northwest involving training and testing at sea. Specifically with regard to the Proposed Action, see the September 2010 Northwest Training Range Complex FEIS/OEIS and the May 2010 Final Environmental Impact Statement/Overseas Environmental Impact Statement NAVSEA NUWC Keyport Range Complex Extension FEIS/OEIS.

Please see Section 3.4.3.1.18 of the NWTT FEIS/OEIS (Application of the Marine Mammal Protection Act to Potential Acoustic and Explosive Effects) and the Estimated Take of Marine Mammals section of the proposed rule for a description of "take" and note that the overwhelming majority of takes predicted for all species—including those mentioned above by the commenters—are short-term behavioral responses to relatively short-term activities (Level B harassment). Further, the majority of these Level B takes are expected to be in the form of milder responses (i.e., lower-level exposures that still rise to the level of take, but would be less severe in the ranges of responses that qualify as a take) and are not expected to have deleterious impacts on the fitness of any individuals or long-term consequences to populations of marine mammals. Effects on marine mammals will minimized through the Navy's implementation of the following mitigation measures (among others): (1) the use of lookouts to monitor for marine mammals and begin powerdown and shutdown of sonar when marine mammals are detected within ranges where the received sound level is likely to result in temporary threshold shift (TTS) or injury; (2) the use of mitigation zones that avoid exposing marine mammals to levels of explosives likely to result in injury or death of marine mammals; and (3) vessel maneuvering protocols. NMFS and the Navy have also worked to develop

a robust monitoring plan to improve our understanding of the environmental effects resulting from the use of active sonar and underwater explosives. Additionally, the proposed rule includes an adaptive management component that allows for timely modification of mitigation or monitoring measures based on new information, when appropriate.

Regarding southern resident killer whales, and as discussed in the Group and Species-Specific Analysis section of this rule, the Navy's acoustic analysis predicts only 2 instances of Level B harassment (behavioral reaction) of southern resident killer whales from sonar and other active acoustic sources during annual training activities in the Study Area. The Navy has not asked for, and NMFS has not authorized, any takes resulting from mortality or injury for southern resident killer whales. No injury or mortality is predicted by the acoustic impact modeling, or anticipated to result from the continuation of Navy training and testing, which has been occurring in the area for decades. The Navy and NMFS considered numerous studies analyzing the impact from chronic noise associated with vessel traffic as well as other threats, and these are cited in the NWTT FEIS/OEIS, Section 3.4.2.4 (General Threats) and Section 3.4.3.1.5 (Physiological Stress). As described in the Biological Opinion, the available scientific information does not provide evidence that exposure to acoustic stressors from Navy training and testing activities will impact the fitness of any individuals of this species. Therefore, exposure to acoustic stressors will not have population or species level impacts.

NMFS considered the distribution of southern resident killer whales in its effects analysis. The majority of the Navy's proposed training and testing activities would not occur in the southern resident killer whale's designated critical habitat (NMFS, 2006).

Furthermore, the majority of testing events would occur in Hood Canal, where southern resident killer whales are not believed to be present (southern resident killer whales have not been reported in Hood Canal or Dabob Bay since 1995 [NMFS, 2008c]), while the majority of training activities would occur in the offshore portions of the Study Area, where they are only present briefly during their annual migration period. As the commenters noted, NMFS issued a 12-month finding on a petition to revise the critical habitat for this species earlier this year (80 FR 9682, Feb. 24, 2015); however, as stated in that notice, NMFS does not anticipate developing a proposed rule for comment until 2017. The Navy and NMFS will consider as appropriate any revisions to the critical habitat designation. Finally, to further support awareness of southern resident killer whale in the Study Area, prior to Maritime Homeland Defense/Security Mine Countermeasure Integrated Exercises, the Navy will conduct pre-event planning and training to ensure environmental awareness of all exercise participants. When this event is proposed to be conducted in Puget Sound, Navy event planners will consult with Navy biologists who will contact NMFS during the planning process in order to determine the likelihood of gray whale or southern resident killer whale presence in the proposed exercise area as planners consider the specifics of the event.

As discussed in the Group and Species-Specific Analysis section of this rule, take numbers for ESA-listed mysticetes are also predicted to be low relative to estimated stock abundances, and occasional behavioral reactions are predicted to occur at low received levels and are unlikely to cause long-term consequences for individuals or populations. Furthermore, there is no designated critical habitat for mysticetes in the Study Area.

The number of harbor porpoises behaviorally harassed by exposure to MFAS/HFAS in the Study Area is higher than the other species because of the low Level B harassment threshold (we assume for the purpose of estimating take that all harbor porpoises exposed to 120 dB or higher MFAS/HFAS will be taken by Level B behavioral harassment), which essentially makes the ensonified area of effects significantly larger than for the other species. However, the fact that the threshold is a step function and not a curve (and assuming uniform density) means that the vast majority of the takes occur in the very lowest levels that exceed the threshold (it is estimated that approximately 80 percent of the takes are from exposures to 120 dB to 126 dB), which means that anticipated behavioral effects are not expected to be severe (e.g., temporary avoidance). See the Analysis and Negligible Impact Determination section of this rule for further information regarding the expected impacts to harbor porpoises.

Moore and Barlow (2013) have noted a decline in beaked whale populations in a broad area of the Pacific Ocean within the U.S. Exclusive Economic Zone. However, there are scientific caveats and limitations to the data used for that analysis, as well as oceanographic and species assemblage changes on the U.S. Pacific coast not thoroughly addressed. Although Moore and Barlow (2013) have noted a decline in the overall beaked whale population along the Pacific coast, in the small fraction of that area where the Navy has been training and testing with sonar and other systems for decades (the Navy's Southern California (SOCAL) Range Complex), higher densities and long-term residency by individual Cuvier's beaked whales suggest that the decline noted elsewhere is not apparent where Navy sonar use is most intense. Navy sonar training and testing is not conducted along a large part of the U.S. west coast from which Moore and Barlow

(2013) drew their survey data. In Southern California, based on a series of surveys from 2006 to 2008 and a high number encounter rate, Falcone *et al*. (2009) suggested the ocean basin west of San Clemente Island may be an important region for Cuvier's beaked whales given the number of animals encountered there. Follow-up research (Falcone and Schorr, 2012, 2014) in this same location suggests that Cuvier's beaked whales may have population sub-units with higher than expected residency, particularly in the Navy's instrumented Southern California Anti-Submarine Warfare Range. Encounters with multiple groups of Cuvier's and Baird's beaked whales indicated not only that they were prevalent on the range where Navy routinely trains and tests, but also that they were potentially present in much higher densities than had been reported for anywhere along the U.S. west coast (Falcone *et al*., 2009, Falcone and Schorr, 2012). This finding is also consistent with concurrent results from passive acoustic monitoring that estimated regional Cuvier's beaked whale densities were higher where Navy trains in the SOCAL training and testing area than indicated by NMFS's broad scale visual surveys for the U.S. west coast (Hildebrand and McDonald, 2009). See the Analysis and Negligible Impact Determination section of this rule for further information regarding the expected impacts to beaked whales.

Marine Mammal Density Estimates

Comment 2: The Commission stated that it was unsure how the Navy determined that extrapolated densities better represent expected densities than densities from relevant environmental suitability (RES) models in the absence of density data. The Commission recommended that NMFS require the Navy to (1) account for uncertainty in extrapolated density estimates for all species by using the upper limit of the 95% confidence interval

or the arithmetic mean plus two standard deviations and (2) then re-estimate the numbers of takes accordingly.

Response: As noted in the Commission's comment, the Navy coordinated with NMFS scientists at the Southwest Fisheries Science Center (SWFSC) and the National Marine Mammal Laboratory (NMML) to help identify the best available density estimates for marine mammals occurring in the Study Area. Regarding the use of extrapolated density estimates from the SWFSC rather than using estimates from RES models, in the Pacific Ocean the distribution patterns predicted by the RES model do not correspond well to known species distribution patterns. RES density estimates for some of the other Navy Study Areas (e.g., HSTT) were found to be orders of magnitude different from density estimates derived from multiple years of systematic line-transect survey data (Department of the Navy 2014 – Navy Marine Species Density Database Technical Report). Therefore, in the absence of density data, extrapolation of density estimates from well-studied regions to lesser-known regions was deemed more appropriate than using RES data, which have shown to be inconsistent with what is known to be a more representative estimate of species density.

The use of a mean density estimate is consistent with the approach taken by NMFS to estimate and report the populations of marine mammals in the Stock Assessment Reports, and the estimated mean is thus considered the "best available data." Adjusting the mean estimates as suggested would result in unreasonable take estimates, particularly given the very high coefficients of variation (CVs) associated with most marine mammal density estimates. Note that the CVs in the Navy's marine species density database for the California Current Ecosystem represent the interannual

variability in marine mammal occurrence; the CV does not represent uncertainty in the model predicted density estimates. Further, the Navy's acoustic model includes conservative estimates of all parameters (e.g., assumes that the animals do not move horizontally, assumes they are always head-on to the sound source so that they receive the maximum amount of energy, etc.), which results in a more conservative (i.e., greater) assessment of potential impacts.

Comment 3: The Commission recommended that NMFS require the Navy to (1) incorporate data from Raum-Suryan *et al*. (2004) and Call *et al*. (2007) and consult with scientists at NMML regarding unpublished data to revise the areas used in estimating Steller sea lion densities in the offshore and Western Behm Canal areas, (2) incorporate data from Robinson et al. (2012) into the areas used in estimating northern elephant seal densities in the offshore and Western Behm Canal areas, (3) incorporate data from Weise *et al*. (2006) and consult with scientists at NMML regarding unpublished data to revise the areas used in estimating California sea lion densities in the offshore area, and (4) incorporate data from Ream *et al*. (2005), Lea *et al.* (2009), Melin *et al*. (2012), Pelland *et al*. (2014), and Sterling *et al*. (2014) and consult with scientists at NMML to revise its northern fur seal density estimates by using movement and dispersion data from tagged fur seals specific to the study area and scaled to the population.

Response: With respect to estimating Steller sea lion (SSL) density offshore and in the Western Behm Canal, the Navy Pacific Marine Species Density Database Technical Report (Department of the Navy, 2014) used the eastern stock of SSL (highest stock estimate was used), multiplied by 0.25 (Bonnell and Bowlby, 1992) to get at-sea numbers. This numbers was then divided by the area of the eastern stock of SSL

(1,244,000 km^2) to get a uniform distribution density estimate. Raum-Suryan *et al*. (2005) and Call *et al*. (2007) present the movement, dispersal and haulout use of juvenile (Call et al.) and juvenile and pups (Raum-Suryan *et al*.). Both papers confirm SSLs are present in the offshore and Western Behm Canal portions of the NWTT. However, these papers present information on haul out use, round trip duration, and distance of a subset of the available population, which may be useful for small estimates of area use. This information is limited to juveniles and pups, and does not represent the range of area that is potentially covered by all SSLs in the eastern stock of SSLs. Therefore, as most literature indicates a wide variety of dispersal and movement among age classes and sex, the uniform distribution was used. In short, this information does not change the analysis presented in the NWTT FEIS/OEIS. See the Revised May 2015) Navy Marine Species Density Database Technical Report available at *http://www.nwtteis.com*.

With regard to the density of northern elephant seals, the area used for calculation was based on all animals in the LeBouef *et al*. (2000) paper and was mistakenly reported in the Technical Report as only females. The Robinson *et al*. (2012) study presents reinforcing data on the presence of northern elephant seals in both the NWTRC offshore and Western Behm Canal portions of the NWTT Study Area and the incorporation of the Robinson study would not change the analysis of impacts on the stock.

The Weise *et al*. (2006) paper adds to the information regarding movements of a subset of animals under “anomalous” conditions and for the majority of the Pacific coast of North America, which is outside the NWTT Study Area. Given these factors, it was not included in the definition of area. However, the findings are not inconsistent with the current analysis; California sea lions are assumed to be present in the Study Area. The

Navy has also taken into account monitoring data on California sea lions in the Study Area, as presented in Section 3.4.2.29 (California Sea Lion [*Zalophus californianus]*) of the NWTT FEIS/OEIS, including that from local researchers (i.e., NMML) in the Pacific Northwest. Ream *et al*. (2005), Melin *et al*. (2012) and Lea *et al*. (2009) all indicate that there is some use of the nearshore areas of the NWTT off Washington and Oregon by pups and females, and those findings are not inconsistent with the current analysis. Regarding Pelland *et al*. (2014) and Sterling *et al*. (2014), who document a highly pelagic distribution of northern fur seals through the offshore areas of the Study Area where the majority of training would occur, the Navy used these studies to develop its at-sea densities, described in the Pacific Marine Species Density Database Technical Report, which were derived as Study Area-wide single density values by season (U.S. Department of the Navy, 2014b). Pelland et al. (2014) and Sterling *et al*. (2014) were discussed in the *Analysis of Guadalupe Fur Seal Exposures* in the proposed rule

The Commission's suggested novel method of determining a density of pinnipeds based on the presence of tagged animals and then "scaled to the population" may be investigated in the future as the science and methodology evolves. NMFS, along with the Navy, will continue to work with researchers and scientists at NMML in the development of future at-sea analyses.

Comment 4: The Commission recommended that NMFS require the Navy to (1) revise its abundance estimates to include data from Allen and Angliss (2014) and Carretta et al. (2014) to determine Steller sea lion and northern fur seal densities in both the offshore and Western Behm Canal areas, (2) update the Guadalupe fur seal take estimates based on the revised northern fur seal density estimates and provide better justification

for the reduction in Guadalupe fur seal takes for the offshore area, and (3) revise its abundance estimates to include updated data for harbor seals in the Western Behm Canal area, if available.

Response: The Navy used the best available science and consulted with regional marine mammal experts in the derivation of the data used in the analysis. The Navy incorporated abundance estimates for Steller sea lions and northern fur seals from the most recent (2014) stock assessment reports (Caretta *et al*., 2015, Allen and Angliss, 2015) into the NWTT FEIS/OEIS (see Section 3.4.2.28.2 Abundance and 3.4.2.30.2 Abundance). The reported increase in abundance estimates does not result in a significant change in the density estimates and does not affect the impact assessment.

Regarding the reduction in Guadalupe fur seal takes for the offshore area, the Navy's September 26, 2014 revision to the LOA application included an update to the effects analysis for Guadalupe fur seals to more realistically reflect potential impacts from offshore Navy training and testing activities. The analysis used to modify the Guadalupe fur seal takes is fully described in Analysis of Guadalupe Fur Seal Exposures in the proposed rule (80 FR 31738, June 3, 2015; page 31792.

The Navy's Marine Species Density Database Technical Report, was revised in May 2015 to update the density estimates for harbor seals in the NWTT Study Area. The report is available at *http://www.nwtteis.com*. These updates did not affect marine mammal densities used for acoustic impact modeling nor change the results of the acoustics effects analysis.

Comment 5: The Commission recommended that NMFS require the Navy to use Hubner *et al*.'s (2001) harbor seal haul-out correction factors of 1.50 for the offshore

area, 1.85 for the Strait of Juan de Fuca and San Juan Islands, 1.51 for Eastern Bays, and 1.36 for Puget Sound rather than a pooled correction factor of 1.53. The proportion of seals at sea for each of those areas also should be adjusted accordingly and then incorporated with the relevant abundance estimates to derive the appropriate density estimates.

Response: The Navy corresponded with Huber and other regional harbor seal scientists at the NMML regarding appropriate haul out correction factors. While Huber *et al*. (2001) did report a regional correction factor for each survey site, analysis of variance (ANOVA) results in the same paper concluded there was no significant difference between any of the locations and proportion ashore. Therefore, the regional combined haulout factor can be viewed as a conservative approach. The Navy did, however, apply the revised stock assessment (2014 SAR) for the Hood Canal resident population of harbor seals.

Comment 6: The Commission recommended that NMFS require the Navy to use a haul-out correction factor of 1.49 rather than 0.198 to determine the overall abundance of harbor seals for the Western Behm Canal area and apply a correction of 0.33 to determine the proportion of the overall abundance at sea, which then is used to derive the density estimate.

Response: With regard to Western Behm Canal, the description of the correction factor, as reported in the Marine Mammal Occurrence/Density Report (U.S. Department of the Navy, 2010, prepared in support of Navy activities at the Southeast Alaska Acoustic Measurement Facility [SEAFAC]), is confusingly written as 0.198. The text was written as “Total seals were calculated as the 1,094 seals hauled out in the area

(Withrow *et al.*, 1999) plus an at sea correction factor of 0.198 of the haul-out count (Allen and Angliss, 2010)." The "plus" in this language was meant to indicate that the Simpkins 1.198 factor was used to achieve a total population of 1,310. The at-sea proportion based on the Simpkins value (which Allen and Angliss used) would be approximately 216 animals, and this value is reported in the Navy's Marine Species Density Database Technical Report. While the confusing language was carried into the Technical Report, the methodology is the same as presented in the Commission's comment and the density reported would not change.

Using a mean haulout correction factor of 1.47 would revise the density estimate from 0.29 seals per km^2 to 0.56 seals per km^2. Given that Southeast Alaska (Clarence Strait) stock of harbor seals would not be exposed to sound that would exceed the current impact thresholds (as listed in Section 3.4 [Marine Mammals] of the NWTT FEIS/OEIS), it is unlikely that any revisions to density values will result in a change in modeled effects.

Comment 7: The Commission recommended that NMFS require the Navy to provide the methods by which species-specific densities were calculated for each area and each season and cite the primary literature from which the data originated.

Response: The Navy Pacific Marine Species Density Database Technical Report (Department of the Navy, 2014) includes individual species-specific descriptions of the density estimates used for each area and each season. The seasonal delineation used by the Navy is specifically described in the Technical Report (Section 3.2). Due to the many different sources of data used, all sections incorporate by reference the literature from which the estimates were taken. In addition, Chapter 3.3 (Information on Density Data

Sources Considered and Included) of the Technical Report provides additional details on the main data sources used (and for many of the systematic surveys maps are included to show the extent of the study area or transects surveyed). For those cases where density estimates were taken directly from an existing report (*e.g.*, U.S. Department of the Navy, 2010, Marine Mammal Occurrence/Density Report), a general description is provided but it is beyond the scope of this document to summarize all the information contained in each of the reports that are incorporated by reference.

The technical report is available on the NWTT FEIS/OEIS website at: *http://nwtteis.com/DocumentsandReferences/NWTTDocuments/SupportingTechnicalDocuments.aspx.* The Navy continues to use the best available science, and this information will be considered in future projects.

Criteria and Thresholds

Comment 8: The Commission recommended that NMFS require the Navy to update Finneran and Jenkins (2012) to include the appropriate justification for its use of the 6-dB extrapolation factor between explosive and acoustic sources; use 151 dB rather than 152 dB re 1 μPa2-sec as the TTS threshold for high-frequency cetaceans exposed to acoustic sources; use 145 rather than 146 dB re 1 μPa2-sec as the TTS threshold for high-frequency cetaceans for explosive sources; and based on these changes to the TTS thresholds, adjust the PTS thresholds for high-frequency cetaceans by increasing the amended TTS threshold by 20 dB for acoustic sources and 15 dB for explosive sources, and adjust the behavioral thresholds by decreasing the amended TTS thresholds by 5 dB for explosive sources.

Response: At the time the acoustic criteria and thresholds were developed, no direct measurements of TTS due to non-impulsive sound exposures were available for any high-frequency cetacean; therefore, the relationship between onset-TTS sound exposure level (SEL)-based thresholds (Type II weighted) for mid-frequency cetaceans exposed to impulsive and non-impulsive sounds (beluga data) was used to derive the onset-TTS threshold for high-frequency cetaceans exposed to non-impulsive sounds (6-dB difference). The derived high-frequency cetacean non-impulsive onset TTS threshold is consistent with data recently published by Kastelein, *et al*. (2012) on TTS measured after exposing a harbor porpoise to non-impulsive sounds.

The acoustic and explosive thresholds were adjusted based on weighting the exposures from the original research from which the thresholds were derived with the Type II weighing functions. The weighted threshold is not derived by a simple amplitude shift. The high-frequency cetacean onset TTS threshold is based on the onset-TTS threshold derived from data in Lucke *et al*. (2009) for impulsive exposures. This threshold was subsequently adjusted in Finneran and Jenkins (2012) to reflect Type II high-frequency cetacean weighting. Therefore, a simple 19.4 dB adjustment to the thresholds presented in Southall *et al*. (2007) is not appropriate.

As detailed in Finneran and Jenkins (2012), the thresholds presented incorporate new findings since the publication of Southall et al. (2007) and the evolution of scientific understanding since that time. Please note that Dr. Finneran was one of the authors for Southall *et al*. (2007) and so is completely familiar with the older conclusions present in the 2007 publication; therefore, Dr. Finneran was able to integrate that knowledge into the development of the refined approach that was presented in Finneran and Jenkins

(2012), based on evolving science since 2007. NMFS is confident that the thresholds and criteria used in the NWTT analysis have already incorporated the correct balance of conservative assumptions that tend towards overestimation in the face of uncertainty. Details regarding the process are provided in Section 3.4.3.1.14 (Quantitative Analysis) of the NWTT EIS/OEIS. In addition, the summary of the thresholds used in the analysis are presented in Section 3.4.3.1.10 (Thresholds and Criteria for Predicting Acoustic and Explosive Impacts on Marine Mammals).

Comment 9: The Commission recommended that NMFS require the Navy to (1) adjust the behavioral response function (BRF_1) for low-frequency cetaceans and BRF_2 for mid- and high-frequency cetaceans (except harbor porpoises and beaked whales), phocids, and otariids with appropriate *K* and *A* parameters based on the basement parameter and the weighted TTS thresholds and (2) recalculate its behavioral take estimates for all marine mammals exposed to acoustic sources based on those revised BRFs.

Response: Please see the NWTT FEIS/OEIS, Section 3.4.3.1.10 (Thresholds and Criteria for Predicting Acoustic and Explosive Impacts on Marine Mammals) and Finneran and Jenkins (2012) for details describing how the criteria and thresholds used in the analysis were derived. Hearing impairment such as TTS is based on an SEL threshold and behavior is based on the sound pressure level of the highest ping received. The predicted higher order effect from the acoustic effects model is the potential effect that is reported. Note that Level B harassment includes both predicted TTS and behavioral responses.

Regarding the raw number of exposures presented in the modeling technical report (Navy Marine Species Modeling Team, 2013) and the difference between the non-TTS exposures for harbor porpoise when compared to Dall's porpoise and *Kogia* spp, note that, as presented in the NWTT FEIS/OEIS, Section 3.4.3.1.12.1 (Sonar and Other Active Acoustic Sources), a sound pressure level of 120 dB re 1 µPa is used in this analysis as a threshold for predicting behavioral responses in harbor porpoises, whereas for the high-frequency cetaceans like Dall's porpoise and *Kogia* spp. (see Table 3.4-6 of the NWTT FEIS/OEIS), the behavioral response threshold is the received level SPL: BRF_2 using Type 1 weighting. Additionally, these species have unique density distributions and dive profiles which can result in very different modeling results.

Regarding the confusion about TTS and behavioral takes, note that over time, for some events, such as slow moving or stationary sources and stationary animats, PTS and TTS takes increase with multiple pings and increased energy. However, multiple pings would not cause the outer range of the behavioral takes to increase. Therefore, the fixed pool of animals that are taken (PTS + TTS + behavioral) does not change but, over time, some TTS become PTS, and some behavioral takes become TTS. The result of this is that, ultimately, the behavioral takes are reduced and become smaller, eventually fewer than the number of TTS.

Comment 10: The Animal Legal Defense Fund *et al*. commented that the Navy and NMFS failed to set proper thresholds for threshold shift and injury. They base this on the following: First, NMFS's direct extrapolation of data from bottlenose dolphins and belugas to low-frequency cetaceans is not justifiable and insufficiently conservative. Second, NMFS makes no attempt to account for the potential bias in Space and Naval

Warfare Systems Command's (SPAWAR) bottlenose dolphin data, particularly the age of the subjects used in these influential studies and their situation for years within a noisy bay. Third, NMFS's weighting curve for high-frequency cetaceans is not sufficiently conservative in light of ongoing studies, as by Ron Kastelein. Fourth, NMFS's analysis fails to incorporate empirical data on both humans and marine mammals indicating that permanent threshold shift can occur at levels previously thought to cause temporary threshold shift only.

Response: NMFS disagrees. The criteria and thresholds for determining potential effects on marine species used in the NWTT EIS/OEIS, the LOA application, and the proposed rule were developed based on best available science. See the cited Finneran and Jenkins (2012; Criteria and Thresholds for U.S. Navy Acoustic and Explosive Effects Analysis Technical Report), which can be found at *http://www.nwtteis.com*.

Regarding the commenters' first point, NMFS disagrees that the thresholds are unjustified and insufficiently conservative. Please see the discussion presented in the NWTT FEIS/OEIS Section 3.4.2.3.3 (Low-Frequency Cetaceans) and Section 3.4.3.1.11 (Frequency Weighting) to understand the derivation of the thresholds and criteria for low frequency cetaceans. Specifically it was the low- and high-frequency cetacean weighting functions (see Southall *et al*. (2007) that were extrapolated from the dolphin data because of the suspected similarities of greatest susceptibility at best frequencies of hearing consistent with the best available science. The Navy uses experimentally derived mid-frequency cetacean thresholds to assess PTS and TTS for low-frequency cetaceans, since mid-frequency cetaceans are the most similar to the low frequency group (see Southall *et al*. (2007); Finneran and Jenkins (2012)). Although the mid-frequency criteria and

thresholds are applied to low frequency cetaceans, exposures and threshold sound exposure levels are weighted using the low frequency cetacean weighting function rather than the mid-frequency which provides higher susceptibility to low frequency sound, consistent with their inferred frequencies of best hearing. Data for low frequency cetaceans considered in the analysis also includes that from Ketten (2014) for blue whales and minke whales, Ketten and Mountain (2014) for humpback whales, and Cranford and Krysl (2015) for fin whales. Observed vocalization frequencies, observed reactions to playback of sounds, anatomical analyses of the auditory system (Cranford and Krysl (2015); Houser *et al*. (2001); Ketten (2014); Ketten and Mountain (2014); Parks *et al*., (2007)), and a general understanding of mammalian hearing are the reasons and science behind why the methodology in the NWTT FEIS/OEIS and the proposed rule is justifiable. NMFS disagrees that the approach is not conservative given that low frequency cetaceans do not echolocate and that the physiology of mysticetes indicates a lack of sensitivity to high frequency sound.

NMFS disagrees with the commenters' second point, as the data used in the analysis included many animals and species at multiple experimental facilities around the world as well as auditory measurements on wild animals that had stranded, in addition to anatomical analyses of the auditory system of mysticetes (Cranford and Krysl (2015); Houser *et al*. (2001); Ketten (2014); Ketten and Mountain (2014); Parks *et al*. (2007)). Direct measurement of hearing sensitivity exists for approximately 25 species of marine mammals, including the following cetacean species: Atlantic white-sided dolphins (Houser *et al.*, 2010a), common dolphins (Houser, Dankiewicz-Talmadge *et al*., 2010), Atlantic bottlenose dolphins (Johnson, 1967), Indo-Pacific bottlenose dolphins (Houseret

et al., 2010a), Black Sea bottlenose dolphins (Popov *et al*., 2007), striped dolphins (Kastelein *et al*., 2003), white-beaked dolphins (Nachtigall *et al*., 2008), Risso's dolphins (Nachtigall *et al*., 2005), belugas (Finneran *et al*., 2005; White *et al*., 1977), long-finned pilot whales (Pacini *et al*., 2010), false killer whales (Yuen *et al*., 2005), killer whales (Szymanski *et al*., 1999), Gervais' beaked whales (Finneran *et al*., 2009), and Blainville's beaked whales (Pacini *et al*., 2011).

Regarding the commenters' third point, the most recent publications by Dr. Kastelein are cited and were considered in the analysis presented in the NWTT FEIS/OEIS (see Kastelein *et al*., 2014a, 2014b, 2105). In reference to the most recent publication involving non-pulse sources (sonar) from Kastelein *et al*. (2015), the authors found that the threshold shift criteria proposed by Southall *et al*. (2007) for cetaceans echolocating at high frequency (SEL 215 dB re 1 lPa2s) was too high for the harbor porpoise when considering high duty cycle sonars. Kastelein *et al*. (2015) documented fatiguing sounds at duty cycles of 10 percent (one sonar ping every 10 seconds) and 100 percent (one ping immediately followed by another). The high duty cycle sonar used in Kastelein's study were a different frequency (6-7 kHz) and produce sound at a higher rate than the Navy's hull-mounted mid-frequency anti-submarine sonar, which nominally produces one ping every 45 seconds. Therefore, the Kastelein (2015) study and its findings do not relate to the Navy's proposed action or the sonar sources proposed for use in the NWTT Study Area.

Additionally, TTS represents a physiological metric for a behavioral reaction and that an exposure resulting in TTS has been and is considered an MMPA Level B harassment take. As presented in Section 3.4.3.1.12.1(Sonar and Other Active Acoustic

Sources, Subsection "Harbor Porpoises") of the NWTT FEIS/OEIS, the Navy and NMFS are aware of the sensitivity of harbor porpoises and have established a sound pressure level of 120 dB re 1 µPa as a threshold for predicting behavioral responses in harbor porpoises and Level B takes pursuant to the MMPA.

The reference to Tougaard *et al*. (2014) cited by the commenters has been considered in the NWTT FEIS/OEIS. The point raised in that reference was that the Southall *et al*. (2007) weighting functions need updating given there have been new studies that have since become available. The Navy's analysis is in fact based on an update to Southall *et al*. (2007) as detailed in Finneran and Jenkins (2012). In the opinion of the authors, the net result from revisions to the weighting functions like that used by the Navy (Finneran and Jenkins, 2012) is that they are not guaranteed to be conservative enough specifically with regard to sound sources such as pile driving, "seal scarers," and high-frequency pingers. With the exception of high frequency pingers, these sources are not part of the Navy's proposed action. As detailed in Section 3.4.3.1.11.2 (Hearing Loss – Temporary and Permanent Threshold Shift; see reference to Finneran (2015)) in the NWTT FEIS/OEIS, the Navy and NMFS are in the process of reviewing the latest and best available science to further refine future acoustic analyses using weighting functions.

Regarding the commenters' fourth point, NMFS and the Navy have incorporated empirical data on humans (see the NWTT FEIS/OEIS citations to Ward *et al*., 1958, 1959a, b; and Miller *et al*., 1963).

With regard to the references cited by the commenters: Kastak *et al*. (2008) reported PTS in a harbor seal after an exposure of 202 dB SEL at 4.1 kHz. This exposure level is 5 dB above the PTS onset criteria used by Navy analyses, and thus the Navy

would have predicted PTS for this exposure. The Kastak *et al*. data are therefore in complete agreement with the criteria and thresholds used in the Navy's analysis and the proposed rule. Kujawa and Liberman (2009) reported TTS in mice of 40 dB measured 24 h after exposure. Thresholds were found to recover completely (thus there was no PTS) but other signs of auditory damage were found, such as neural degeneration and a decrease in suprathreshold evoked response amplitudes. A similar study by Lin *et al*. (2011) with guinea pigs found similar results after TTS of >50 dB measured 24 h after exposure. Since no lower level exposures were utilized, it is not known if the suite of auditory damage observed by Kujawa and Liberman (2009) and Lin *et al*. (2011) would have occurred with lesser exposures. Navy's analyses assumed PTS (and thus injury) would occur after exposures producing TTS of 40 dB or more measured ~4 minutes after exposure. Therefore, the exposures used by Kujawa and Liberman (2009) and Lin *et al.* (2011) would have been considered injurious by the Navy criteria. Therefore, both the Kastak *et al*. (2008) and Kujawa and Liberman (2009) studies are consistent with the Navy's use of TTS of 40 dB, measured ~4 min after exposure, as an indicator for auditory injury.

Comment 11: The Animal Legal Defense Fund *et al*. provided several comments, which were originally set forth in a detailed critique by Dr. David Bain, that were critical of the acoustic risk function used by the Navy and NMFS to estimate the probability of behavioral effects that NMFS would classify as harassment. The commenters assert that these risk functions are flawed and underestimate take.

Response: Dr. Bain's critique is not directly relevant to the proposed action in the NWTT Study Area. It is in reference to older Navy EISs (2007 Hawaii Range Complex

(HRC) Navy DEIS/OEIS; 2006 Undersea Warfare Training Range (USWTR) DEIS/OEIS) that analyze different actions in another geographic location, and is no longer current as the science has evolved over the last seven years. The criteria and thresholds for determining potential effects on marine species used in the Navy's NWTT FEIS/OEIS and related consultation documents have been appropriately revised based on the best available science since the 2006 and 2007 Draft EISs which Dr. Bain reviewed (see Finneran and Jenkins (2012). Dr. Bain's critique is therefore dated and not directly relevant to the proposed rule or the Navy's analysis for the NWTT Study Area as presented in the NWTT FEIS/OEIS. Please also note that all comments from Dr. Bain's critique were previously responded to in the 2009 Hawaii Range Complex FEIS/OEIS. Particular aspects of Dr. Bain's critique highlighted by the commenters are discussed in Comments and Responses 12 through 19.

Comment 12: The Animal Legal Defense Fund *et al*. commented that NMFS and the Navy rely on studies of temporary threshold shift in captive animals for one of their primary source of data.

Response: The Navy's model uses the best available science to analyze impacts and often overestimates the potential effects of its activities by considering the worst case scenario (e.g., modeling for the loudest sound source within a source bin); see the NWTT FEIS/OEIS Section 3.4.3.1.14.4 (Model Assumptions and Limitations) for details in this regard. The criteria and thresholds for determining potential effects on marine species used in the NWTT FEIS/OEIS and related consultation documents have been revised based on the best available science since the 2007 HRC DEIS/OEIS and the 2006

USWTR DEIS/OEIS. See Finneran and Jenkins (2012), which can be found at *http://www.nwtteis.com*.

NMFS and marine mammal scientists recognize the limitations of controlled experiments using captive animals, but there are no alternative scientific methods to document the onset of TTS, especially in wild animals. It is inaccurate to describe these limitations as deficiencies. Furthermore, commenters are incorrect that the TTS data used in the analysis is from only seven animals in the Navy's research program in the SPAWAR complex. Data used in the analysis and cited in the NWTT FEIS/OEIS also includes results from other species and non-Navy/SPAWAR animals – for example see Lucke *et al*. (2009); Kastelein *et al*. (2012b, 2012c); Kastak *et al*. (2005); Nachtigall, *et. al*. (2003); and Southall *et al*. (2007).

Comment 13: The Animal Legal Defense Fund *et al*. commented that NMFS and the Navy appear to have misused data garnered from the Haro Strait incident by including only those levels of sound received by the "J" pod of killer whales when the USS Shoup was at its closest approach.

Response: Details of the analysis of the Haro Strait event were presented in the NWTT FEIS/OEIS Section 3.4.3.1.6. (Behavioral Reactions to Sonar and Other Active Acoustic Sources; subsection *Odontocetes*). The Navy and NMFS reviewed testimony, video, and all field notes from the time of the event, and have accurately used that documented data in the analysis for the NWTT activities. That data clearly indicated that the behaviors observed were within the species' normal range of behaviors and there were no immediate or general overt negative behavioral reactions observed at the time of the exposure. Furthermore, the presence of numerous small motor vessels maneuvering

in close proximity to the orca further complicated any assessment of possible reactions related to sonar from a vessel.

Comment 14: The Animal Legal Defense Fund *et al*. commented that NMFS and the Navy exclude a substantial body of controlled exposure research and opportunistic studies on wild animals (and some research on other experimental animals as well, within a behavioral experimental protocol). For example, NMFS and the Navy fail to include data from the July 2004 Hanalei Bay event, in which 150-200 melon-headed whales were embayed for more than 24 hours during the Navy's Rim of the Pacific exercise.

Response: NMFS disagrees. The studies cited by the commenters are cited in the proposed rule and in the NWTT FEIS/OEIS and were fully considered in the analysis. Section 3.4 of the NWTT FEIS/OEIS contains citations to additional controlled exposure research on wild animals including, for example, DeRuiter *et al*. (2013a, b), Defence Science and Technology Laboratory (2007); Claridge and Durban (2009); McCarthy *et al*. (2011); Miller *et al*. (2012); Moretti *et al*. (2009); Southhall *et al*. (2011, 2012a, 2012b, 2013, 2014); Stimpert *et al*. (2014); and Tyack *et al*. (2011).

Regarding the Hanalei Bay event, NMFS included an extensive analysis of this event in the Potential Effects section of the proposed rule (80 FR 31738, June 3, 2015; pages 31764-31765. Please see that section for further information regarding NMFS' assessment and consideration of that event. It should be noted that NMFS considered active sonar transmissions a plausible, if not likely, contributing factor in the Hanalei stranding in what may have been a "confluence of events," including a unique interaction of biological and physical factor—most of which are not expected to occur in the NWTT Study Area or during NWTT activities. The biological factors may have included the

presence of an apparently uncommon, deep-diving cetacean species (and possibly an offshore, non-resident group), social interactions among the animals before or after they entered the Bay, and/or unknown predator or prey conditions. The physical factors may have included the presence of nearby deep water, multiple vessels transiting in a directed manner while transmitting active sonar over a sustained period, the presence of surface sound ducting conditions, and/or intermittent and random human interactions while the animals were in the Bay.

Comment 15: The Animal Legal Defense Fund *et al*. commented that NMFS and the Navy also fail to incorporate data on harbor porpoises and beaked whales in their dataset.

Response: NMFS disagrees with the commenters' assessment. The Navy and NMFS have used studies on harbor porpoises and beaked whales in the data sets used for analysis. Please see Section 3.4.3.1.12.1 (Sonar and Other Active Acoustic Source) of the NWTT FEIS/OEIS where this information is presented. The analysis includes, for example, data from both captive and wild harbor porpoises (see Kastelein *et al*. (2000, 2005b) and Johnston (2002)) and behavioral responses from a wild population of beaked whales as documented by Tyack *et al*. (2011). Please also refer to the cited Finneran and Jenkins (2012) for additional details. Finally, please see the discussions presented in Section 3.4.3.1.14.4 of the NWTT FEIS/OEIS (Model Assumptions and Limitations), which describes the numerous conservative assumptions incorporated into the Navy's model.

Comment 16: The Animal Legal Defense Fund *et al*. commented that the risk function should have taken into account the social ecology of some marine mammal species.

Response: The Navy and NMFS have taken these factors into account. As detailed in the NWTT FEIS/OEIS Section 3.4.3.1.14.3 (Navy Acoustic Effects Model) and the Navy's Determination of Acoustic Effects Technical Report (Marine Species Modeling Team 2013), group size is accounted for in the modeling of acoustic effects. Additionally, the behavioral response function includes observations of the J-pod in Haro Strait.

Comment 17: The Animal Legal Defense Fund *et al*. commented that NMFS' threshold is applied in such a way as to preclude any assessment of long-term behavioral impacts on marine mammals. It does not account, to any degree, for the problem of repetition: the way that apparently insignificant impacts, such as subtle changes in dive times or vocalization patterns, can become significant if experienced repeatedly or over time.

Response: NMFS disagrees. This analysis is presented in the NWTT FEIS/OEIS in Section 3.4.3.1.9 (Long-Term Consequences to the Individual and the Population) and Section 3.4.3 (Summary of Impacts (Combined Impacts of all Stressors) on Marine Mammals) where cumulative impacts are addressed, as well as in the Long-Term Consequences section of this rule. Assessment of long-term cumulative impacts to species and stocks is also represented by the discussion in Section 3.4.4.1 of the NWTT FEIS/OEIS (Summary of Monitoring and Observations During Navy Activities). NMFS finds that the vast majority of impacts expected from sonar exposure and underwater

detonations are behavioral in nature, temporary and comparatively short in duration, relatively infrequent, and specifically not of the type or severity that would be expected to be additive for the small portion of the stocks and species likely to be exposed.

This analysis is further corroborated by the healthy, and in some locations, increasing marine mammal populations, where sonar use has been occurring for decades and is frequently in use on an annual basis, such as on instrumented ranges. As noted previously, there is no evidence that Navy activities have had or are having any long-term impact on marine mammal populations or stocks. For more information, see the Long-Term Consequences discussion in the Analysis and Negligible Impact Determination section of this rule.

Comment 18: The Animal Legal Defense Fund *et al*. commented that while NMFS and the Navy have assigned a specific threshold to beaked whales, in light of Tyack *et al*. (2011), it is clear that some beaked whales are taken on exposure to mid frequency sonar at levels below 140 decibels (SPL).

Response: The Navy and NMFS specifically considered the Tyack *et al*. (2011) study, which was cited in the NWTT FEIS/OEIS, and its findings were incorporated into the threshold for beaked whales (see the FEIS/OEIS Section 3.4.3.1.6 (Behavioral Reactions)). During Tyack *et al*.'s (2011) research at the Navy's fixed tracking range in the Bahamas, animals were observed to leave the immediate area of the anti-submarine warfare training exercise (avoiding the sonar acoustic footprint at a distance where the received level was "around 140 dB" SPL. Further, Moretti *et al*. (2014) recently derived an empirical risk function for Blainville's beaked whale that predicts there is a 0.5 probability of disturbance at a received level of 150 dB SPL, suggesting that in some

cases the current step function may over-estimate the effects of an activity using sonar on beaked whales. Therefore, NMFS has concluded that, based on the best available science, 140 dB re 1μPa (root mean square) is a conservative threshold for predicting potential behavioral effects on beaked whales from sonar signals.

Comment 19: The Animal Legal Defense Fund *et al*. commented that there are additional flaws in the Navy's acoustic effects modeling, which include: a lack of any indication that the Navy has accounted for reverberation effects in its modeling, or that its modeling sufficiently represents areas in which the risk of reverberation is greatest; and a failure to consider the possible synergistic effects on marine mammal physiology and behavior of using multiple acoustic sources in spatial and temporal proximity.

Response: NMFS disagrees. As presented in the Section 3.4.3.1.14.3 (Navy Acoustic Effects Model) of the NWTT FEIS/OEIS and in the referenced modeling technical report (Marine Species Modeling Team, 2013), the Navy's acoustic effects modeling incorporates the most up to date marine mammal density data and oceanographic data for the quantification of predicted acoustic impacts to marine mammals. Contrary to the assertions in the comment, the model does account for a fully three-dimensional environment in calculating sound propagation and exposures incorporating site-specific bathymetry, sound speed profiles, wind speed, and bottom properties into the propagation modeling process. As noted in the NWTT FEIS/OEIS, the modeling accounts for all sources within a scenario simultaneously, so this modeling approach specifically accounts for the combined (additive) effects from using multiple acoustic sources in spatial and temporal proximity (i.e., the cumulative SEL is a

composite of all sources received by the animat). Multiple conservative assumptions are incorporated into the model.

Vessel Strike

Comment 20: The Animal Legal Defense Fund *et al*. commented that the Navy and NMFS failed to evaluate ship collisions with large cetaceans, and recommended that the Navy model potential ship strikes in the same way it models acoustic harassment and injury. The Commission also recommended that NMFS require the Navy to use its spatially and temporally dynamic simulation models rather than simple probability calculations to estimate strike probabilities for specific activities (i.e., movement of vessels, torpedoes, unmanned underwater vehicles and use of expended munitions, ordnance, and other devices).

Response: The potential for ship strikes is discussed in the NWTT FEIS/OEIS, Section 3.4.3.4.1 (Impact from Vessel Strikes), Chapter 6 of the LOA application (Section 6.7, Estimated Take of Large Whales by Navy Vessel Strike), and throughout this rule. There has never been a recorded vessel strike of a whale during any active training or testing activities in the NWTT Study Area. There has been only one whale strike in the Pacific Northwest by the Navy since such records have been kept (June 1994-present). In August 2012, a San Diego homeported DDG (destroyer) at-sea about 35 nm west of Coos Bay, Oregon struck a whale (believed to be a minke) while transiting to San Diego from Seattle. The whale (believed to be a minke whale) was last seen swimming away from the location. The fate of the animal is unknown and although no blood or other obvious indications of injury to the whale were detected, this does not negate the possibility that there may have been serious internal injury to the whale

resulting from the encounter. It is important to note that the vessel strike mitigation procedures proposed for the NWTT activities (see Mitigation) were not employed during the August 12 ship strike incident that occurred during non-training activities (with the exception of "safe speed" protocols), and these measures are expected to effectively mitigate the potential impacts to marine mammals from vessel strike during the NWTT training and testing activities.

Any increase in vessel movement, as discussed in Section 3.4.3.4.1 (Impacts from Vessel Strikes) of the NWTT FEIS/OEIS, over the No Action Alternative is still well below areas such as Southern California and Hawaii where the density of large whales and the number of Navy activities is higher than that for the NWTT Study Area and yet strikes to large whales are still relatively rare in the SOCAL and Hawaii Range Complexes. Further, there are fewer Navy vessels for NWTT that are homeported in the Study Area than in the previous years included in the historical record. Additionally, while the number of training and testing activities is likely to increase, it is not expected to result in an appreciable increase in vessel use or transits since multiple activities usually occur from the same vessel. Finally, the Navy is not proposing substantive changes in the locations where vessels have been used over the last decade. In summary, neither the Navy nor NMFS anticipates vessel strikes to marine mammals during training or testing activities within the Study Area, and NMFS is not authorizing mysticete takes (by injury or mortality) from vessel strikes during the 5-year period of the NWTT regulations. However, the Navy has proposed measures (see Mitigation) to mitigate potential impacts to marine mammals from vessel strikes during training and testing activities in the Study Area.

The Navy considered using a dynamic simulation model to estimate strike probability. However, the Navy determined, and NMFS concurs, that the use of historical data was a more appropriate way to analyze the potential for strike. The Navy's strike probability analysis in the NWTT FEIS/OEIS is based upon actual data collected from historical use of vessels, in-water devices, and military expended materials, and the likelihood that these items may have the potential to strike an animal. This data accounts for real world variables over the course of many years, and any model would be expected to be less accurate than the use of actual data.

The suggestion to use the Navy's acoustic effects model to determine the probability of a strike would not provide a more reliable estimate of strike probability given that there are so many unknown but critical values which would be necessary as required inputs. There is no available science regarding the necessary functional parameters for a complex dynamic whale strike simulation model; there are large unknowns regarding the data that would be necessary such as the density, age classes, and behavior of large whales in the NWTT Study Area; and there are no means to validate the output of a model given there is no empirical data (not strikes) to "seed the dynamic simulation." Therefore, use of historical data from identical activities elsewhere and additional use of a probability analysis remain a more reasonable analytical approach.

Mitigation and Monitoring

Comment 21: Some commenters suggested that the rule fails to include meaningful mitigation and monitoring measures that would ensure the "least practicable impact" as obligated by the MMPA.

Response: NMFS disagrees. Under section 101(a)(5)(A) 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." NMFS' duty under this "least practicable adverse impact" standard is to prescribe mitigation reasonably designed to minimize, to the extent practicable, any adverse population-level impacts, as well as habitat impacts. While population-level impacts are minimized by reducing impacts on individual marine mammals, not all takes have a reasonable potential for translating to population-level impacts. NMFS' objective under the "least practicable adverse impact" standard is to design mitigation targeting those impacts on individual marine mammals that are reasonably likely to contribute to adverse population-level effects.

The mitigation measures required by this rule are discussed in the NWTT FEIS/OEIS and in the Mitigation section of this rule. In summary, the mitigation measures include the use of visual and acoustic methods to detect marine mammals, procedures to relocate or delay events where marine mammals have been detected, monitoring of event locations and marine mammals before, during, and after events, and the continued reporting of Navy activity and interactions with marine mammals as has been occurring since 2006. Please also note that the rule requires a robust adaptive management program that regularly addresses new information and allows for modification of mitigation and/or monitoring measures as appropriate. The mitigation measures are informed by years of experience and monitoring, which has shown them to be effective. NMFS has determined that the mitigation measures are adequate means of

effecting the least practicable adverse impacts on marine mammals species or stocks and their habitat, paying particular attention to rookeries, mating grounds, and areas of similar significance, while also considering personnel safety, practicality of implementation, and impact on the effectiveness of the military readiness activity.

Comment 22: The Commission recommended that NMFS require the Navy to provide the predicted average and maximum ranges for all impact criteria (i.e., behavioral response, TTS, PTS, onset slight lung injury, onset slight gastrointestinal injury, and onset mortality), for all activities (i.e., based on the activity category and representative source bins and including ranges for more than 1 ping), and for all functional hearing groups of marine mammals within the three NWTT areas (i.e., offshore, inland waters, and Western Behm Canal).

Response: Ranges to effects for all criteria and functional hearing groups are provided for representative active sonars (Section 3.4.3.2.1.1, Range to Effects) and explosives (Section 3.4.3.2.2.1, Range to Effects) in the NWTT FEIS/OEIS. The representative sources include the most powerful active sonar source and the charge with the largest net explosive weight analyzed. NMFS believes that these representative sources provide adequate information to analyze potential effects on marine mammals. Because the Navy conducts training and testing in a variety of environments having variable acoustic propagation conditions, variations in acoustic propagation conditions are considered in the Navy's acoustic modeling and the quantitative analysis of acoustic impacts. Average ranges to effect are provided in the NWTT FEIS/OEIS to show the reader typical zones of impact around representative sources. The presentation of a maximum range based on a worst case analysis under extreme conditions would fail to be

representative and therefore potentially confuse readers by presentation of a range to effects that are extremely unlikely to ever be present in actual real world conditions.

As explained in the NWTT FEIS/OEIS in Section 3.4.3.2.1.1 (Range to Effects), there is no reason to show a PTS range for more than one ping because of the short distances involved, even in the case of the most powerful hull mounted source. The ship moves beyond the PTS zone for each successive ping, and there is no difference in successive pings. Given all the science detailed in the NWTT FEIS/OEIS (see for example Section 3.4.3.2.1.2, Avoidance Behavior and Mitigation Measures as Applied to Sonar and Other Active Acoustic Sources) indicating that marine mammals will behaviorally avoid high levels of sound, the assumption that a marine mammal would not remain alongside a pinging vessel is a simple but reasonable assumption. As presented in the NWTT FEIS/OEIS, while 10 knots was the speed used in modeling the ship's speed of advance, a ship engaged in anti-submarine warfare training or testing would be moving at between 10 and 15 knots. For the majority of marine mammals, the distance to a PTS exposure is within 10 meters of the sonar dome, and that distance is not influenced significantly by differing ocean environments given that the calculated range to a PTS is almost entirely a function involving the physics of spreading loss. The comment's assumption that the distances provided in Tables 3.4-10 and 3.4-11 of the NWTT DEIS/OEIS do not apply to NWTT is incorrect.

Because the Navy conducts training and testing in a variety of environments having variable acoustic propagation conditions, variations in acoustic propagation conditions are considered in the Navy's acoustic modeling and the quantitative analysis of acoustic impacts. Although the Navy pointed out the complexity of acoustic modeling in

inland waters, it would be incorrect to conclude that modeling therefore lacked precision. The Navy acoustic modeling makes use of the most accurate information and environmental data available, including the inland waters where these activities would take place.

The Navy's NWTT FEIS/OEIS and supporting technical documents provide the detail to make the analysis fully transparent. Details of this model's processes and the description and derivation of the inputs are presented in the Navy's Determination of Acoustic Effects Technical Report (Marine Species Modeling Team, 2013). As presented in Section 3.4.3.1.14.3 (Navy Acoustic Effects Model) of the NWTT FEIS/OEIS, the model incorporates actual site-specific bathymetric relief, sound speed profiles, wind speed, and bottom properties into the propagation analysis.

Comment 23: The Commission recommended that NMFS require the Navy to use a second clearance category of 60 minutes for beaked whales and sperm whales if the animal has not been observed exiting the mitigation zone.

Response: NMFS does not concur with the Commission's recommendation that the Navy should use a second clearance category of 60 minutes for deep-diving species for the following reasons:

- As described in the NWTT FEIS/OEIS in Chapter 5 (Standard Operating Procedures, Mitigation, and Monitoring), a 30-minute wait period more than covers the average dive times of most marine mammals.
- The ability of an animal to dive longer than 30 minutes does not mean that it will always do so. Therefore, the 60-minute delay would only potentially add value in instances when animals had remained under water for more than 30 minutes.

- Navy vessels typically move at 10–12 knots (5–6 m/sec) when operating active sonar and potentially much faster when not. Fish *et al*. (2006) measured speeds of seven species of odontocetes and found that they ranged from 1.4–7.30 m/ sec. Even if a vessel was moving at the slower typical speed associated with active sonar use, an animal would need to be swimming near sustained maximum speed for an hour in the direction of the vessel's course to stay within the safety zone of the vessel. Increasing the typical speed associated with active sonar use would further narrow the circumstances in which the 60-minute delay would add value.
- Additionally, the times when marine mammals are deep-diving (i.e., the times when they are under the water for longer periods of time) are the same times that a large portion of their motion is in the vertical direction, which means that they are far less likely to keep pace with a horizontally moving vessel.
- Given that, the animal would need to have stayed in the immediate vicinity of the sound source for an hour, and considering the maximum area that both the vessel and the animal could cover in an hour, it is improbable that this would randomly occur. Moreover, considering that many animals have been shown to avoid both acoustic sources and ships without acoustic sources, it is improbable that a deep-diving cetacean (as opposed to a dolphin that might bow ride) would choose to remain in the immediate vicinity of the source.

Furthermore, the Navy was aware of the diving behaviors of marine mammals and integrated the data in Watwood and Buonantony (2012) into its modeling. In summary, NMFS believes that it is unlikely that a single cetacean would remain in the safety zone of a Navy sound source for more than 30 minutes, and therefore disagrees

with the Commission that a second clearance category of 60 minutes for deep-diving species is necessary. The Navy's acoustic analysis predicts that that injury to deep-diving marine mammals (e.g., sperm whales and beaked whales) are not expected to occur in the Study Area.

Comment 24: The Animal Legal Defense Fund *et al*. commented that NMFS should limit all Navy training and testing activities that use sonar and explosives that overlap biologically important areas identified along the Washington, Oregon, and Northern California coasts and off the coast of Southern Alaska. Time/Area closures were specifically recommended for NMFS-identified biologically important areas, Olympic Coast National Marine Sanctuary (OCNMS), Puget Sound, and Marine Protected Areas. Other commenters also recommended consideration of time/area limitations in biologically sensitive areas in the Study Area.

Response: The Navy and NMFS have fully considered area-specific mitigation measures for the Navy's low use of mid-frequency active sonar and other activities in areas of particular importance (e.g., BIAs, OCNMS, MPAs, Puget Sound) to marine mammals. See the *Consideration of Time/Area Limitation* section of this rule for an assessment of Navy activities within these areas, along with clarification of, or updates to, mitigation measures within these areas. In addition, the analysis of mitigation measures in Chapter 5 (Standard Operating Procedures, Mitigation, and Monitoring) of the NWTT FEIS/OEIS provides an analysis of the activities in these BIAs, which has been incorporated into the analysis in Section 3.4 (Marine Mammals) of the NWTT FEIS/OEIS. Chapters 5 (see Section 5.3.4.12, Avoiding Marine Protected Areas) and 6 of the NWTT FEIS/OEIS include an analysis of the MPAs.

NMFS has determined that the mitigation measures required by this rule (especially when the adaptive management component is taken into consideration), including those clarified or updated above (see *Consideration of Time/Area Limitation*), are adequate means of effecting the least practicable adverse impacts on marine mammals species or stocks and their habitat, paying particular attention to rookeries, mating grounds, and areas of similar significance, while also considering personnel safety, practicality of implementation, and impact on the effectiveness of the military readiness activity.

Comment 25: The Animal Legal Defense Fund *et al*. suggested the use of sonar and other active acoustic systems at the lowest practicable source level, with clear standards and reporting requirements for different testing and training scenarios.

Response: The Navy uses active sonar at the lowest practicable source level consistent with mission requirements. See Section 5.3.4.1.3 of the NWTT FEIS/OEIS (Reducing Sonar Source Levels and Total Number of Hours) for further information.

Comment 26: The Animal Legal Defense Fund *et al*. suggested expansion of the marine species "safety zone" to a 4 km shutdown, reflecting international best practice, or 2 km, reflecting the standard prescribed by the California Coastal Commission for similar activities in Southern California.

Response: Section 5.3.4.1.13 of the NWTT FEIS/OEIS (Increasing the Size of Observed Mitigation Zones) discusses mitigation zone expansion. See also Section 5.3.4.1.16 of the NWTT FEIS/OEIS (Adopting Mitigation Measures of Foreign Navies). There is no internationally recognized best practice with regard to mitigation zone distance. The Navy developed activity-specific mitigation zones based on the Navy's

acoustic propagation model. Each recommended mitigation zone is intended to avoid or reduce the potential for onset of the lowest level of injury, PTS, out to the predicted maximum range. Mitigating to the predicted maximum range to PTS consequently also mitigates to the predicted maximum range to onset mortality (1 percent mortality), onset slight lung injury, and onset slight gastrointestinal tract injury, since the maximum range to effects for these criteria are shorter than for PTS. Furthermore, in most cases, the mitigation zone actually covers the TTS zone.

The mitigation zones contained in this final rule represent the maximum area the Navy can effectively observe based on the platform of observation, number of personnel that will be involved, and the number and type of assets and resources available. As mitigation zone sizes increase, the potential for reducing impacts decreases. For instance, if a mitigation zone increases from 1,000 to 4,000 yd. (914 to 3,658 m), the area that must be observed increases sixteen-fold, which is not practicable. The mitigation measures contained in this final rule balance the need to reduce potential impacts with the Navy's ability to provide effective observations throughout a given mitigation zone. Implementation of mitigation measures is most effective when the mitigation zone is appropriately sized to be realistically observed. The Navy does not have the resources to maintain additional Lookouts or observer platforms that would be needed to effectively observe mitigation zones of increased size.

Comment 27: The Animal Legal Defense Fund *et al*. suggested that the Navy delay or relocate activities when beaked whales are detected through passive acoustic monitoring and when significant aggregations of any species or particularly vulnerable or

endangered species are detected by any means in the vicinity of an exercise, even if potentially occurring beyond the established mitigation zone.

Response: Mitigation will be implemented within the mitigation zone for all marine mammals regardless of species or numbers of animals if they approach or enter a mitigation zone. NMFS disagrees that it is necessary to delay or relocate activities when beaked whales, other sensitive species or significant aggregations of marine mammals are detected outside the mitigation zones. For the NWTT activities, the Navy developed each recommended mitigation zone to avoid or reduce the potential for onset of the lowest level of injury, PTS, out to the predicted maximum range. Furthermore, in most cases, the predicted maximum range to PTS also consequently covers the predicted average range to TTS. The activity-specific mitigation zones are based on the longest range for all the functional hearing groups. The mitigation zone for a majority of activities is driven by either the high-frequency cetaceans or the sea turtle functional hearing groups. Therefore, the mitigation zones are even more protective for the remaining functional hearing groups (i.e., low-frequency cetaceans, mid-frequency cetaceans, and pinnipeds). The predicted ranges are based on local environmental conditions and are unique to the NWTT Study Area.

With respect to passive acoustic monitoring, all passive acoustic detections will be reported to Lookouts to increase vigilance of the visual surveillance. However, as stated previously, passive acoustic monitoring can neither provide range or bearing to detected animals, and therefore cannot provide locations of these animals.

Comment 28: The Animal Legal Defense Fund *et al*. suggested use of simulated geography (and other work-arounds) to reduce or eliminate chokepoint exercises in near-

coastal environments, particularly within canyons and channels, and use of other important habitat.

Response: There are no chokepoint exercises in the NWTT Study Area. Further, NMFS notes that the Navy has clarified that certain activities will not occur in the near-coastal environment. As explained previously in this rule, the Navy will conduct Missile Exercises using high explosives at least 50 nm from shore in the NWTRC Offshore Area, the Navy will conduct BOMBEX (high explosive munitions) events at least 50 nm from shore, and the Navy will conduct BOMBEX (non-explosive practice munitions) events at least 20 nm from shore.

As discussed in Section 2.5.1.4 (Simulated Training and Testing) and Section 5.3.4.1.2 (Replacing Training and Testing with Simulated Activities) of the NWTT FEIS/OEIS, the Navy uses computer simulation for training and testing whenever possible. However, training in near-coastal environments is an essential component to maintaining military readiness. Computer simulation can provide familiarity and complement live training; however, it cannot provide the fidelity and level of training necessary to prepare naval forces for deployment. Sound propagates differently in shallower water and operators must learn to train in this environment. Additionally, submarines have become quieter through the use of improved technology and have learned to hide in the higher ambient noise levels of the shallow waters of coastal environments. In real world events, it is highly likely Sailors would be working in, and therefore must train in, these types of areas. The littoral water space is also the most challenging area to operate in due to a diverse acoustic environment. It is not realistic or practicable to refrain from training in the areas that are the most challenging and

operationally important. Operating in near-costal environments is essential in order to provide realistic training on real world combat conditions with regard to shallow water sound propagation.

The Navy will implement mitigation for all training and testing activities to minimize any potential effects. Further, the Navy does have a particular set of monitoring measures (intended to help reduce the chance of a stranding) that would be applied if a combination of circumstances exist that are thought to make a stranding more likely (e.g., steep bathymetry, multiple vessels using sonar in a single area over an extended period of time, constricted channels or embayments). However, a combination of these environmental and operational features is not present in the NWTT Study Area.

Comment 29: The Animal Legal Defense Fund *et al*. suggested avoidance or reduction of training during months with historically significant surface ducting conditions; delay of activities or use of power-downs during significant surface ducting conditions; and use of additional power-downs when significant surface ducting conditions coincide with other conditions that elevate risk.

Response: The mitigation measures required by this rule, which have proven effective over years of monitoring and reporting, apply to activities conducted during surface ducting conditions. Avoiding or reducing active sonar during surface ducts for the purpose of mitigation would increase safety risks to personnel, be impractical with regard to implementation of military readiness activities, and result in unacceptable impacts on readiness for the following reasons: The Navy must train in the same manner as it will fight. Submarines have long been known to exploit the phenomena associated with surface ducting. Therefore, training in surface ducting conditions is a critical

component to military readiness because sonar operators need to learn how sonar transmissions are altered due to surface ducting, how submarines may take advantage of them, and how to operate sonar effectively in this environment. Avoiding activities during periods with surface ducting conditions or requiring the use of power-downs during surface ducting conditions would reduce a sonar operator's ability to effectively operate in a real world combat situation, thereby resulting in an unacceptable increased risk to personnel safety and the ability to achieve military readiness. Furthermore, avoiding surface ducting would be impractical to implement because ocean conditions contributing to surface ducting change frequently, and surface ducts can be of varying duration. See section 5.3.4.1.9 of the NWTT FEIS/OEIS for more information on avoiding or reducing activities during surface ducting conditions.

Comment 30: The Animal Legal Defense Fund *et al*. suggested that the Navy plan their ship tracks to avoid embayments and provide escape routes for marine mammals.

Response: First, NMFS notes that the Navy has particular set of monitoring measures (intended to help reduce the chance of a stranding) that would be applied if a combination of circumstances exist that are thought to make a stranding more likely (e.g., steep bathymetry, multiple vessels in a single area over an extended period of time, and in areas of constricted channels or embayments). However, a combination of these environmental and operational features is not present in the NWTT Study Area. Further, the majority of Navy training activities involving "ship tracks" would occur in the offshore portion of the Study Area and therefore not involve embayments. In inland waters where there may be areas that could be considered embayments, ship tracks are generally constrained by the vessel traffic separation scheme, safety of operation, and

mission requirements. See Section 5.3.4.1.6 of the NWTT FEIS/OEIS (Limiting Activities to a Few Specific Locations) for further information regarding limiting the location of activities.

Comment 31: Several commenters suggested that the Navy limit their activities to periods of good visibility. More specifically, the Animal Legal Defense Fund *et al*. suggested

that all weapons firing in missile and bombing exercises involving detonations exceeding 20 lb. net explosive weight take place during the period 1 hour after sunrise to 30 minutes before sunset.

Response: NMFS believes that effective mitigation measures are already in place to address missile and bombing exercises. The Navy must train at night and in low-visibility conditions to ensure personnel may operate in similar conditions when required for actual operations. After sunset and prior to sunrise, watch personnel employ night visual search techniques, which could include the use of night vision devices. Please see the Mitigation section of the rule for further information. Section 5.3.4.1.8 of the NWTT FEIS/OEIS (Avoiding or Reducing Active Sonar at Night and During Periods of Low Visibility) also discusses activities conducted during varying environmental conditions.

NMFS clarifies that historically, Navy bombing exercises in the NWTT Study area are very infrequent and have occurred greater than 50 nm from shore in order to avoid other users and for marine safety purposes. Conducting these exercises greater than 50 nm from shore has the practical effort of affording environmental protections to certain species such as southern resident killer whale, salmonids, and harbor porpoise that generally are not in these areas. The Navy proposes to continue to conduct bombing and

missile exercises with high explosives at least 50 nm off shore in the NWTT study area. In addition, Bombex and other events using non-explosive practice munitions are not anticipated to occur within 20 nm of shore in NWTT Study area, and SINKEX are not proposed to occur in the NWTT Study area.

Comment 32: The Animal Legal Defense Fund *et al*. suggested suspension or postponement of chokepoint exercises during surface ducting conditions and scheduling of such exercises during daylight hours.

Response: There are no chokepoint exercises in the NWTT Study Area. See our Responses to Comment 29 regarding avoiding or reducing activities during surface ducting conditions. See our Response to Comment 31 regarding avoidance of activities at night.

Comment 33: The Animal Legal Defense Fund *et al*. suggested use of dedicated aerial monitors during chokepoint exercises, major exercises, and near-coastal exercises.

Response: There are no chokepoint or Major Training Exercises proposed for the NWTT Study Area. Please refer to Section 2 of the NWTT FEIS/OEIS for a detailed description of the action. As described throughout Chapter 5 of the NWTT FEIS/OEIS and in this rule (see "Mitigation" section), visual observation (aerial and vessel-based) would be conducted in association with Navy activities. Specific aerial monitoring is not typically feasible given the limited duration of typical monitoring flights (less than 4 hours). In addition, there are significant flight safety considerations and airspace restrictions during many Navy exercises when larger groups of military aircraft are present in high numbers at various altitudes.

Comment 34: The Animal Legal Defense Fund *et al*. suggested use of dedicated passive acoustic monitoring to detect vocalizing species, through established and portable range instrumentation and the use of hydrophone arrays off instrumented ranges. The Commission also recommended that NMFS require the Navy to use passive and active acoustics, whenever practicable, to supplement visual monitoring during the implementation of its mitigation measures for all activities that could cause PTS, injury, or mortality beyond those explosive activities for which passive acoustics already was proposed. The Commission questioned why passive and active acoustic monitoring used during the Navy's Surveillance Towed Array Sensory System Low Frequency Active (SURTASS LFA) activities is not applied here.

Response: As described in Section 5 of the NWTT FEIS/OEIS and this rule, the Navy will conduct passive acoustic monitoring during several activities. The Navy will use passive acoustic monitoring to supplement visual observations during IEER sonobuoy activities, explosive sonobouys using >0.5-2.5 lb net explosive weight, and torpedo (explosive) testing exercises, to detect marine mammal vocalizations. The Navy does not have the resources to construct and maintain passive acoustic monitoring systems for each training and testing activity. See Section 5.3.4.1.13 of the NWTT FEIS/OEIS (Increasing Visual and Passive Acoustic Observations) for more information regarding the use of passive sensors. For additional information on the Navy's marine mammal monitoring efforts, see *http://www.navymarinespeciesmonitoring.us*/.

The active sonar system used by SURTASS LFA is unique to the platforms that use SURTASS LFA. Moreover, this system requires the platforms that carry SURTASS LFA to travel at very slow speeds for the system to be effective. For both of these

reasons it is not possible for the Navy to use this system for the platforms analyzed in the NWTT FEIS/OEIS.

Comment 35: The Animal Legal Defense Fund *et al*. suggested modification of sonobuoys for passive acoustic detection of vocalizing species.

Response: Modifying sonobuoys to increase their bandwidth is considered impractical for the Navy because it would require significant modification to the sonobuoy receiving equipment at a substantial cost and reduce the effectiveness of the sonobuoy system's ability to detect submarines. See section 5.3.4.1.13 of the NWTT FEIS/OEIS (Increasing Visual and Passive Acoustic Observations) for further information regarding the use of passive sensors.

Comment 36: The Animal Legal Defense Fund *et al*. suggested use of aerial surveys and ship-based surveys before, during, and after multi-unit exercises.

Response: There are no Major Training Exercises proposed for NWTT. See Chapter 2 of the NWTT FEIS/OEIS for a discussion of the Proposed Action and a description of events that may involve more than one unit, such as a helicopter coordinating with a surface vessel. As described throughout Chapter 5 of the NWTT FEIS/OEIS and this rule, visual observation (aerial and vessel-based) would be conducted in association with Navy activities. Specific aerial monitoring is not typically effective or feasible given the limited duration of typical monitoring flights (less than 4 hours). In addition, there are significant flight safety considerations and airspace restrictions during Navy training when military aircraft are present in high numbers at various altitudes. Ship- based surveys before, during, and after multi-unit exercises are impractical due to the large amount of resources required and the significant impact such a requirement

would have on readiness. In addition to the mitigation and monitoring required by this rule, which have proven to be effective, the Navy is also committed to a robust marine mammal monitoring program designed to answer specific questions about the effects of the Navy's activities on marine mammals.

Comment 37: The Animal Legal Defense Fund *et al*. suggested use of all available range assets for marine mammal monitoring.

Response: NMFS has worked with the Navy over the years to help develop the most effective mitigation protocols using the platforms and assets that are available for monitoring. The required mitigation measures in this document represent the maximum level of effort (e.g., numbers of Lookouts and passive sonobuoys) that the Navy can commit to observing mitigation zones given the number of personnel that will be involved and the number and type of assets and resources available.

Comment 38: Some commenters believe that using Lookouts as the primary strategy for limiting potential impacts from Navy activities is inadequate. The Animal Legal Defense Fund *et al*. suggested the use of additional Lookouts, and the use of NMFS-certified observers for marine mammal detection. Several commenters requested further information on the Navy's Lookout effectiveness study. More specifically, the Animal Legal Defense Fund *et al*. suggested that the Navy complete a Lookout effectiveness study comparing the abilities of Navy vessel-based Lookouts and third-party protected species observers.

Response: One key component of the monitoring and mitigation required by this rule is the shipboard Lookouts (also known as watchstanders), who are part of the standard operating procedure that ships use to detect objects (including marine mammals)

within a specific area around the ship during events. The Lookouts are an element of the Navy's monitoring plan, as required by NMFS and specified in the LOAs. The goal of Lookouts is to detect marine mammals entering ranges of 200, 500, and 1,000 yd (183, 457, and 914 m) around the vessel, which correspond to distances at which various mitigation actions should be performed. In addition to the Lookouts, officers on the bridge search visually and sonar operators listen for marine mammal vocalizations.

NMFS disagrees that using Lookouts as the primary strategy for limiting potential impacts from Navy activities is inadequate. Navy Lookouts are qualified and experienced observers of the marine environment. All Lookouts take part in Marine Species Awareness Training so that they are better prepared to spot marine mammals. Their duties require that they report all objects sighted in the water to the Office of the Deck (OOD) and all disturbances that may be indicative of a threat to the vessel and its crew. Lookouts are on duty at all times, day and night, when a ship or surfaced submarine is moving through the water. Visual detections of marine mammals would be communicated immediately to a watch station for information disseminations and appropriate mitigation action. The number of Lookouts required for each activity represents the maximum level of effort (e.g., numbers of Lookouts and passive sonobuoys) that the Navy can commit to observing mitigation zones given the number of personnel that will be involved in an activity and the number and type of assets and resources available. The number of Lookouts that the Navy uses for each activity often represents the maximum capacity based on limited resources (e.g., space and manning restrictions). NMFS has carefully considered Navy's use of Lookouts and determined that, in combination with the other mitigation measures identified, the Navy's mitigation

plan will effect the least practicable adverse impacts on marine mammal species or stocks and their habitat.

The Navy has determined that the use of third-party observers (e.g., NMFS-certified protected species observers) in air or on surface platforms in lieu of or in addition to existing Navy Lookouts for the purposes of mitigation is impractical for the following reasons: the use of third-party observers would compromise security for some activities involving active sonar due to the requirement to provide advance notification of specific times and locations of Navy platforms; reliance on the availability of third-party personnel could impact training and testing flexibility; the presence of additional aircraft in the vicinity of naval activities would raise safety concerns; and there is limited space aboard Navy vessels. Furthermore, Navy personnel are extensively trained in spotting items on or near the water surface and receive more hours of training than many third-party personnel.

In 2010, the Navy initiated a study designed to evaluate the effectiveness of the Navy Lookout team. The University of St. Andrews, Scotland, under contract to the Navy, developed an initial data collection protocol for use during the study. Between 2010 and 2012, trained Navy marine mammal observers collected data during nine field trials as part of a "proof of concept" phase. The goal of the proof of concept phase was to develop a statistically valid protocol for quantitatively analyzing the effectiveness of Lookouts during Navy training exercises. Field trials were conducted in the HRC, SOCAL Range Complex, and Jacksonville Range Complex onboard one frigate, one cruiser, and seven destroyers. Preliminary analysis of the proof of concept data is ongoing. The Navy is also working to finalize the data collection process for use during

the next phase of the study. While data was collected as part of this proof of concept phase, those data are not fairly comparable because protocols were being changed and assessed, nor are those data statistically significant. Therefore, it is improper to use these data to draw any conclusions on the effectiveness of Navy Lookouts at this time.

Comment 39: The Animal Legal Defense Fund *et al*. suggested the use of dedicated aerial monitoring for all Navy explosive activities using time-delay firing devices and/or all activities involving explosives greater than 20 lb net explosive weight.

Response: There are no time-delay devices proposed for use in the NWTT Study Area. Further, the largest charge weight (NEW) proposed for use in the NWTT Study Area during Mine Warfare training exercises is a 2.5 lb. charge. Please see Chapter 2 of the NWTT FEIS/OEIS for a detailed description of the action.

Comment 40: The Animal Legal Defense Fund *et al*. suggested the use of gliders or other platforms for pre-activity monitoring to avoid significant aggregations of marine mammals.

Response: The development of passive acoustic detectors on gliders and other platforms is still in the research and development stages under funding from the Office of Naval Research and the Navy's Living Marine Resources programs. While promising, many of the various technologies are still being tested and not ready for transition to compliance monitoring where a higher degree of performance is needed. Gliders, even if able to report in real-time or delayed near real-time, would only be able to document the presence of marine mammals, not the distance of the marine mammals from the glider or individual animal movement. Moreover, gliders would only provide an indication that animals are in the area, but these same animals could easily move substantial distances

over the course of just a few hours. In some cases, use of gliders in and around where Navy submarines also operate is an underwater safety hazard to the submarine and to the glider. Gliders and other passive acoustic platforms, therefore, are more appropriate for broad area searches within Navy ranges to document marine mammal seasonal occurrence, but are not practical as a mitigation tool.

Comment 41: The Animal Legal Defense Fund *et al*. recommended that the Navy comply with underwater detonation and gunnery exercise mitigation measures as set forth in NMFS' 2009 final rule for the SOCAL Range Complex.

Response: The commenters do not elaborate on why the mitigation measures for underwater explosives and gunnery exercises—which are unrelated activities—for the SOCAL Range Complex would be more protective than those currently proposed for similar activities in the NWTT Study Area. Moreover, mitigation measures designed for training and testing activities in the SOCAL Range Complex are not directly applicable to NWTT activities. Mitigation measures for underwater detonations and gunnery exercises for NWTT are described in the Mitigation section and regulatory text of this rule. NMFS has determined that these mitigation measures are adequate means of effecting the least practicable adverse impacts on marine mammal species or stocks and their habitat

Comment 42: The Animal Legal Defense Fund *et al*. recommended avoidance and reduction in the use of timer delays in favor of explosives with positive controls.

Response: There are no time-delay devices proposed for use in the NWTT Study Area. Please see Chapter 2 of the NWTT FEIS/OEIS for a detailed description of the action.

Comment 43: The Animal Legal Defense Fund *et al*. recommended application of ship-speed restriction (*e.g.*, of 10 knots) for support vessels and/or other vessels while transiting high-value habitat for baleen whales and endangered species, or other areas of biological significance, and/or shipping lanes.

Response: The Navy typically chooses to run vessels at slower speeds for efficiency to conserve fuel when possible, which may include speeds less than 5 knots or completely stopped for launching small boats, certain tactical maneuvers, target launch, or retrievals of unmanned underwater vehicles, etc. However, some operational requirements mean that Navy vessels must exceed 10 knots due to unique training, testing, or safety requirements for a given event. Further, imposing an artificial speed restriction only on Navy vessels, which represent an extremely small percentage of ship traffic, particularly in areas of high commercial traffic where no other limits exist, could create safety or navigation concerns where Navy vessels are not traveling at speeds consistent with surrounding traffic.

As discussed earlier in this rule in the Mitigation section, the Navy is clarifying its existing speed protocol: while in transit, Navy vessels shall be alert at all times, use extreme caution, and proceed at a "safe speed" so that the vessel can take proper and effective action to avoid a collision with any sighted object or disturbance, including any marine mammal or sea turtle and can be stopped within a distance appropriate to the prevailing circumstances and conditions. Other mitigation measures will be implemented to avoid vessel strikes, such as maneuvering to keep at least 500 yards from whales observed in a vessel’s path, and not approaching whales head-on, provided it is safe to do so. The Navy will also be required to report any vessel strike.

Navy ship speed has not been implicated in impacts to marine mammals in the NWTT Study Area. As discussed in the Take Request section and elsewhere in this rule, there has never been a recorded vessel strike of marine mammals during any training or testing activities in the Study Area. There has been only one whale strike in the Pacific Northwest by the Navy since such records have been kept (June 1994-present). In August 2012, a San Diego homeported DDG (destroyer) at-sea about 35 nm west of Coos Bay, Oregon struck a whale (believed to be a minke) while transiting to San Diego from Seattle. A detailed analysis of strike data is contained in Section 6.7 (Estimated Take of Large Whales by Navy Vessel Strike) of the LOA application. The Navy's proposed actions would not result in any appreciable changes in locations or frequency of vessel activity, and there have been no recorded whale strikes during any training and testing activities in the Study Area. The manner in which the Navy has trained would remain consistent with the range of variability observed over the last decade so the Navy does not anticipate vessel strikes would occur within the Study Area during training events.

Navy vessel transit potentially occurring within biologically important areas in the NWTT Study Area is discussed in the *Consideration of Time/Area Limitations* section of this rule. In general, there is a very small likelihood of Navy vessel movement in the gray whale feeding area mapped along the northern coast of Washington as ships transit to the offshore training and testing areas. Where there is overlap between vessel movement and gray whale feeding areas in the Study Area (Northern Puget Sound), the potential for Navy vessels to interact with feeding gray whales within this area is low, especially given the proportion of Navy vessels and the short time period (March – May) that whales will be present. Navy vessel traffic is extremely minimal in comparison to

commercial ship traffic within the Northern Washington humpback whale feeding area, and there is an extremely low likelihood of any Navy vessel movements occurring within the two southern humpback whale feeding areas.

Comment 44: The Animal Legal Defense Fund *et al*. recommended application of mitigation prescribed by state regulators, by the courts, by other navies or research centers, or by the U.S. Navy in the past or in other contexts.

Response: NMFS and the Navy worked together on developing a comprehensive suite of mitigation measures to reduce the impacts from Navy training and testing activities on marine mammal species or stocks and their habitat. During the process of developing mitigation measures, NMFS and the Navy considered all potentially applicable mitigation measures. Evaluation of past and present Navy mitigation measures, alternative mitigation measures, and mitigation measures of foreign navies is discussed Chapter 5 of the NWTT FEIS/OEIS. As discussed in the Mitigation section, NMFS has determined that the mitigation measures required by this rule are adequate means of effecting the least practicable adverse impacts 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 impact on the effectiveness of the military readiness activity.

Comment 45: The Animal Legal Defense Fund *et al*. recommended avoidance of fish spawning grounds and of important habitat for fish species potentially vulnerable to significant behavioral change, such as wide- scale displacement within the water column or changes in breeding behavior.

Response: NMFS considered impacts to prey species as a component of marine mammal habitat. Please see the "Marine Mammal Habitat" section of the proposed rule, which included an extensive discussion of the potential impact of the Navy's activities on fish. In summary, long-term consequences to fish populations are not expected. Impacts to fish spawning grounds and habitat use are also considered under the Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA) as it relates to Essential Fish Habitat (EFH). The effect of the Navy's activities on threatened and endangered fish was also addressed in NMFS' Biological Opinion, which concluded that the Navy's activities would not reasonably be expected to reduce appreciably the likelihood of the survival and recovery of any listed fish species

Section 5.3.4.1.11 of the NWTT FEIS/OEIS (Avoiding Marine Species Habitats) discusses habitat avoidance. Section 3.9 of the NWTT FEIS/OEIS (Fish) provides the effects determinations on fish. As noted in Chapter 3.9 of the NWTT FEIS/OEIS, the current science regarding behavioral impacts to fish from sonar is that the potential for effects within the near field (within few tens of meters of the source), intermediate, or far distances is low (Popper *et al*., 2014). For explosives, the potential for behavioral effects is high within a few tens of meters from the source, moderate to high within intermediate distances (100s of meters from the source), and low within the far field (thousands of meters from the source) (Popper *et al*., 2014). Therefore, the type of wide-scale displacement being described by the commenter is unlikely to occur based on the current state of the science.

Comment 46: The Animal Legal Defense Fund *et al*. recommended evaluating before each multi-unit exercise whether reductions in sonar use are possible, given the readiness status of the units involved.

Response: There are no MTEs in the NWTT Study Area. The Navy uses active sonar at the lowest practicable source level consistent with mission requirements. See Section 5.3.4.1.3 of the NWTT FEIS/OEIS (Reducing Sonar Source Levels and Total Number of Hours) for more information.

Comment 47: The Animal Legal Defense Fund *et al*. recommended dedicated research and development of technology to reduce impacts of active acoustic sources on marine mammals.

Response: The Navy has provided a significant amount of funding for marine mammal research. For example, from 2004 to 2012, the Navy provided over $230 million for marine species research and currently sponsors 70 percent of all U.S. research concerning the effects of human-generated sound on marine mammals and 50 percent of such research conducted worldwide. The Navy's research and development efforts have significantly improved our understanding of the effects of Navy-generated sound in the marine environment. These studies have supported the modification of acoustic criteria to more accurately assess behavioral impacts to beaked whales and the thresholds for auditory injury for all species, and the adjustment of mitigation zones to better avoid injury. In addition, Navy scientists work cooperatively with other government researchers and scientists, universities, industry, and non-governmental conservation organizations in collecting, evaluating, and modeling information on marine resources. Navy scientists work cooperatively with other government researchers and scientists,

universities, industry, and nongovernmental conservation organizations in collecting, evaluating, and modeling information on marine resources. Further, the adaptive management process required by this rule regularly considers and evaluates the development and use of new science and technologies for Navy applications. For additional information on the Navy's marine mammal monitoring efforts, see *http://www.navymarinespeciesmonitoring.us*/. For the Navy's Living Marine Resources Applied Research Program see *http://www.lmr.navy.mil*. For the Office of Naval Research's Marine Mammals and Biology Basic Research Program see *http://www.onr.navy.mil/Science-Technology/Departments/Code-32/All-Programs/Atmosphere-Research-322/Marine-Mammals-Biology.aspx*.

Comment 48: The Animal Legal Defense Fund *et al*. recommended establishment of a plan and a timetable for maximizing synthetic training in order to reduce the use of active sonar training.

Response: Section 5.3.4.1.2 of the NWTT FEIS/OEIS (Replacing Training and Testing with Simulated Activities) discusses simulated activities. As described in the NWTT FEIS/OEIS, the Navy currently uses computer simulation for training and testing whenever possible. Computer simulation can provide familiarity and complement live training and testing; however, it cannot provide the fidelity and level of training necessary to prepare naval forces for deployment. The Navy is required to provide a ready and capable force. In doing so, the Navy must operationally test major platforms, systems, and components of these platforms and systems in realistic combat conditions before full-scale production can occur. Substituting simulation for live training and

testing fails to meet the Navy's statutory requirement to properly prepare forces for national defense.

Comment 49: The Animal Legal Defense Fund *et al*. recommended prescription of specific mitigation requirements for individual classes (or sub-classes) of testing and training activities, in order to maximize mitigation given varying sets of operational needs.

Response: The Navy and NMFS have already developed mitigation requirements by activity type to reduce potential impacts from the proposed training and testing activities while not causing an unacceptable impact on readiness. Chapter 5 of the NWTT FEIS/OEIS and the Mitigation section of this final rule discuss these mitigation measures.

Comment 50: The Animal Legal Defense Fund *et al*. recommended timely, regular reporting to NOAA, state coastal management authorities, and the public to describe and verify use of mitigation measures during testing and training activities.

Response: NMFS has long required the Navy to submit timely, regular reports regarding the use of mitigation measures during training and testing activities. Section 3.4.4.1 of the NWTT FEIS/OEIS (Summary of Monitoring and Observations During Navy Activities) provides the results from regular reporting that has occurred since 2006. These reports are publically available at the Navy website *(http://www.navymarinespeciesmonitoring.us/*) and from the NMFS Office of Protected Resources website (*www.nmfs.noaa.gov/pr/permits/incidental/military.htm*). Navy reporting requirements, including exercise and monitoring reporting, are described in the

Monitoring and Reporting section of this final rule and in Section 5.5 of the NWTT FEIS/OEIS (Monitoring and Reporting).

Comment 51: The Animal Legal Defense Fund *et al*. recommended that the Navy agree to additional clean-up and retrieval of discarded debris and expended materials associated with its proposed activities.

Response: The Navy conducted a full analysis of the potential impacts of military expended materials on marine mammals and will implement several mitigation measures to help avoid or reduce those impacts. This analysis is contained throughout Chapter 3 (Affected Environment and Environmental Consequences) of the NWTT FEIS/OEIS. The Navy determined that military expended materials related to training exercises under a worst-case scenario will have no more than a negligible impact on the available soft bottom habitat annually within any of the range complexes. The Navy has standard operating procedures in place to reduce the amount of military expended materials to the maximum extent practical, including recovering targets and associated parachutes.

Comment 52: Some commenters suggested that NMFS did not propose any additional mitigation measures beyond what the Navy included in their LOA application.

Response: NMFS worked closely with the Navy to develop mitigation measures for the Navy's training and testing activities in the NWTT Study Area. The measures that the Navy proposed reflect years of experience and consideration of extensive monitoring results. NMFS and the Navy considered mitigation additional measures, both before and after the public comment period. A description of some of the additional measures that were considered, and how they were analyzed in the context of the "least practicable adverse impact on the species and/or stock" finding, is included in this

document as well as the Navy's NWTT FEIS/OEIS. As described, NMFS has determined that the Navy's proposed mitigation measures (especially when the adaptive management component is taken into consideration (see previous Adaptive Management discussion)), along with the additional requirements detailed in the Mitigation section, are adequate means of effecting the least practicable adverse impacts 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 impact on the effectiveness of the military readiness activity.

Effects Analysis/Takes

Comment 53: The Commission recommended that NMFS require the Navy to request the total numbers of model-estimated Level A harassment (PTS and slight lung and gastrointestinal tract injuries) and mortality takes rather than reducing the estimated numbers of Level A harassment and mortality takes based on the Navy's proposed post-model analysis and base the negligible impact determination analyses on those adjusted takes. Other commenters, including Animal Legal Defense Fund *et al.*, were also critical of the Navy's post-model analysis, claiming that post-model adjustments in takes resulted in underrepresented total takes. Animal Legal Defense Fund *et al.* and other commenters requested further explanation of, or more information on, the post-model reduction process. Both the Commission and the Animal Legal Defense Fund *et al.* expressed concern with observer effectiveness in the Navy's development of mitigation effectiveness scores or g(0) values.

Response: See Section 3.4.3.1.15 (Marine Mammal Avoidance of Sound Exposures) of the NWTT FEIS/OEIS for the discussion of the science regarding the avoidance of sound sources by marine mammals. In addition, the Post-Model Quantitative Analysis of Animal Avoidance Behavior and Mitigation Effectiveness for Northwest Training and Testing Technical Report, available at *http://www.nwtteis.com*, provides additional details regarding how the avoidance and mitigation factors were used and provides scientific support from peer-reviewed research. A comprehensive discussion of the Navy's quantitative analysis of acoustic impacts, including the post-model analysis to account for mitigation and avoidance, is also presented in Chapter 6 of the LOA application, which is available on NMFS' website at *http://www.nmfs.noaa.gov/pr/permits/incidental/military.htm.*

NMFS believes that the post-modeling analysis is an effective method for quantifying the implementation of mitigation measures to reduce impacts on marine mammals and the science regarding the avoidance of sound sources by marine mammals which cannot be captured within the modeling process itself, and that the resulting exposure estimates are, nevertheless, a conservative estimate of impacts on marine mammals from the Navy's proposed activities. As explained in the above-referenced documents, as part of the post-modeling analysis the Navy reduced some predicted Level A (PTS) exposures based on the potential for marine mammals to be detected and mitigation implemented, and the potential for marine mammals to avoid a sound source. Given this potential, not taking into account some possible reduction in Level A exposures would result in a less realistic, overestimation of possible Level A takes, as if there were no mitigation measures implemented. For example, with respect to mitigation

effectiveness, the period of time between clearing the impact area of any non-participants or marine mammals and weapons release is on the order of minutes, making it highly unlikely that a marine mammal would enter the mitigation zone. Information provided in Section 3.4.3.1.16 (Implementing Mitigation to Reduce Sound Exposures) of the NWTT FEIS/OEIS indicates how much of a reduction each factor represents for specific activities. As explained in the documents referenced above, the adjustments move a percentage of the model predicted Level A (PTS) effects at close range to more likely behavioral effects (Level B harassment) and do not conclude that all modeled mortalities or non-PTS injuries will be avoided. This process represents peer-reviewed and accepted scientific process.

The assignment of mitigation effectiveness scores and the appropriateness of consideration of sightability using detection probability, g(0), when assessing the mitigation in the quantitative analysis of acoustic impacts is discussed in the NWTT FEIS/OEIS (Section 3.4.3.1.16, Implementing Mitigation to Reduce Sound Exposures). Additionally, the activity category, mitigation zone size, and number of Lookouts are provided in the proposed rule (80 FR 31738, June 3, 2015, pages 31772-31773) and NWTT FEIS/OEIS (Section 5, Tables 5.3-2 and 5.4-1). In addition to the information already contained within the NWTT FEIS/OEIS, the Post-Model Quantitative Analysis of Animal Avoidance Behavior and Mitigation Effectiveness for the Northwest Training and Testing Technical Report (*http://www.nwtteis.com*) and Chapter 6 of the Navy's LOA application describe the process for the post-modeling analysis in further detail. There is also information on visual detection leading to the implementation of mitigation in the annual exercise reports provided to NMFS and briefed annually to NMFS and the

Commission. These annual exercise reports have been made available and can be found at *http://www.navymarinespeciesmonitoring.us/* in addition to *http://www.nmfs.noaa/pr/permits/incidental*.

The Navy is in the process of assessing Lookout effectiveness at detecting marine mammals during Navy exercises. Lookouts will not always be effective at avoiding impacts on all species. However, Lookouts are expected to increase the overall likelihood that certain marine mammal species and some sea turtles will be detected at the surface of the water, when compared to the likelihood that these same species would be detected if Lookouts are not used. The continued use of Lookouts contributes to helping reduce potential impacts on these species from training and testing activities. Results from the Lookout effectiveness study will be reviewed and any recommendations for improving Lookout effectiveness will be considered at that time. In summary, NMFS and the Navy believe that consideration of marine mammal sightability and activity-specific mitigation effectiveness is appropriate in the Navy's quantitative analysis in order to provide decision makers a reasonable assessment of potential impacts from the Navy's proposed activities.

Comment 54: The Commission recommended that NMFS require the Navy to round its takes based on model-estimated takes to the nearest whole number or zero in all of its take tables.

Response: The exposure numbers presented in the NWTT FEIS/OEIS Criteria and Thresholds Technical Report are raw model outputs that have not been adjusted by post-processing to account for likely marine mammal behavior or the effect from implementation of mitigation measures. All fractional post-processed exposures for a

species across all events within each category subtotal (Training, Testing, Impulse, and Non-Impulse) are summed to provide an annual total predicted number of effects. The final exposure numbers presented in the LOA application and the NWTT FEIS/OEIS incorporate post-processed exposures numbers that have been rounded down to the nearest integer so that subtotals correctly sum to total annual effects rather than exceed the already conservative total exposure numbers.

Comment 55: Some commenters recommended that NMFS fully examine the impacts from sonar, underwater detonations, and other stressors on all organisms (e.g., salmonids and other fish) living within the Study Area.

Response: NMFS considered impacts to marine mammal prey species as a component of their habitat. The effects of the Navy's activities on threatened and endangered fish was also addressed in NMFS' Biological Opinion, which concluded that the Navy's activities would not reasonably be expected to reduce appreciably the likelihood of the survival and recovery of any listed fish species. Impacts to fish spawning grounds and habitat are also addressed under the Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA) as it relates to Essential Fish Habitat (EFH). The Navy consulted with NMFS under the MSFCMA.

Comment 56: The Animal Legal Defense Fund *et al*. commented that the Navy and NMFS failed to adequately assess the impacts of stress on marine mammals.

Response: NMFS fully considered in the proposed rule the potential for physiological responses, particularly stress responses, that could potentially result from exposure to MFAS/HFAS or underwater explosive detonations (see *Stress Response* in the Potential Effects section). NMFS' analysis identifies the probability of lethal

responses, physical trauma, sensory impairment (permanent and temporary threshold shifts and acoustic masking), physiological responses (including stress responses), behavioral disturbance (that rises to the level of harassment), and social responses (effects to social relationships) that would be classified as a take and whether such take would have a negligible impact on such species or stocks. This analysis is included in the Analysis and Negligible Impact Determination in this final rule, and results of the analysis of physiological stress responses are summarized below. The Navy's analysis also considered secondary and indirect impacts, including impacts from stress (see the NWTT FEIS/OEIS Section 3.4 (Marine Mammals)). See for example, Section 3.4.3.1.5 (Physiological Stress), Section 3.4.3.1.9 (Long-Term Consequences to the Individual and the Population), and Section 3.4.3.7 (Impacts from Secondary Stressors). For a discussion of biotoxins, see Section 3.4.2.4 (General Threats).

The studies referenced by the commenters of North Atlantic right whales (e.g., Rolland *et al*., 2012) impacted by chronic noise were cited and considered in the Navy's and NMFS' analysis, as well as similar studies such as Hatch *et al*. (2012) and Parks *et al*. (2007) (see Section 3.4.3.1, Acoustic Stressors in the NWTT FEIS/OEIS; see Potential Effects of Specified Activities on Marine Mammals in the proposed rule). Similar findings for blue whales from the Pacific (Melcon *et al*., 2012) were also considered for mysticetes, as well as similar findings for other marine mammals groups with regard to potential chronic stressors. Note, however, that these studies (and similar studies from the Pacific Northwest such as Williams et al. (2013)) involve chronic noise resulting from the pervasive presence of commercial vessels. The Navy activities in the NWTT Study Area involving active sonar or underwater detonations are infrequent,

short-term, and generally unit level. Unit level events occur over a small spatial scale (one to a few 10s of square miles) and with few participants (usually one or two). Single-unit unit level training would typically involve a few hours of sonar use, with a typical nominal ping of every 50 seconds (duty cycle). Even though an animal's exposure to active sonar may be more than one time, the intermittent nature of the sonar signal, its low duty cycle, and the fact that both the vessel and animal are moving provide a very small chance that exposure to active sonar for individual animals and stocks would be repeated over extended periods of time. Since the impact from noise exposure and the Navy's training and testing events in general should be transitory given the movement of the participants, any stress responses should be short in duration and have less than biologically significant consequences. Consequently, NMFS has determined that the Navy's activities in the NWTT Study Area do not create conditions of chronic, continuous underwater noise and are unlikely to lead to habitat abandonment or long-term hormonal or physiological stress responses in marine mammals.

Comment 57: The Animal Legal Defense Fund *et al*. commented that the Navy would release a host of toxic chemicals, hazardous materials and waste into the marine environment that could pose a threat to marine mammals over the life of the range. They also commented that the Navy plans to abandon cables, wires, and other items that could entangle marine wildlife, including parachutes. The Sun'aq Tribe of Kodiak also commented that the analysis of these materials in the NWTT DEIS/OEIS was inadequate.

Response: The Navy is not proposing to release toxic chemicals, hazardous material, or waste into the marine environment. The NWTT FEIS/OEIS analysis

concluded that material expended during training and testing would not result in water or sediment toxicity, and that no adverse effects on marine organisms would be expected.

In the course of training and testing activities, military expended material is released into the marine environment as detailed in the NWTT FEIS/OEIS Chapter 3.1 (Sediments and Water Quality). The NWTT FEIS/OEIS presents a thorough description and analysis in Section 3.1.3 (Environmental Consequences) of amounts and types of specific training materials as well as chemical composition and breakdown processes of expended materials. The analysis concludes that chemical, physical, or biological changes to sediment or water quality, while measurable, are below applicable standards, regulations, and guidelines, and would be within existing conditions or designated uses. Neither state nor federal standards or guidelines would be violated. Further, as discussed in Section 3.4 of the NWTT FEIS/OEIS, military expended materials are not expected to result in mortality, Level A, or Level B harassment of marine mammals. This conclusion is supported by studies referenced in the NWTT FEIS/OEIS that have investigated the fate of the constituents of military expended materials; see for example the discussion presented in Section 3.4.3.7 (Explosion By-Products and Unexploded Ordnance) and citations to Rosen and Lotufo (2010) and University of Hawaii at Manoa (2010).

In addition, Section 3.1 of the NWTT FEIS/OEIS analyzed the impact from explosives, explosive byproducts, and metals using the best available science. The analysis concluded that the impact of explosives, explosion byproducts, and metals on sediment and water quality would be both short- and long-term, and localized. As above, chemical, physical, or biological changes in sediment or water quality would be measurable, but below applicable standards and guidelines, and would be below or within

existing conditions or designated uses. Further, as discussed in Section 3.4 of the NWTT FEIS/OEIS, secondary stressors are not expected to result in mortality, Level A, or Level B harassment of marine mammals.

Finally, the NWTT FEIS/OEIS analyzed other potential stressors, such as entanglement in cables, wires, and parachutes, in Section 3.4.3.5 (Entanglement Stressors). As discussed in that section, the chance that an individual animal would encounter expended cables or wires is likely low, and it is unlikely that an animal would get entangled even if it encountered a wire. For example, the majority of the "parachutes" expended are 18-inch (in.) diameter cruciform ("X" shaped) decelerators attached with short lines to the top of sonobuoys. These are designed to sink and, given their small size, are very unlikely entanglement hazards for most marine mammals.

Comment 58: The Animal Legal Defense Fund *et al*. commented that the Navy does not adequately analyze the potential for and impact of oil spills (the Commenters make reference to the Exxon Valdez and Cosco Busan oil spill incidents).

Response: The analysis presented in the NWTT FEIS/OEIS is limited to the activities and reasonable outcomes of such activities. As accidents involving large oil spills from commercial oil tankers are not reasonably foreseeable outcomes of proposed Navy training or testing, this scenario is not addressed or analyzed. It is noteworthy that the two examples provided by the comment did not occur in the NWTT Action Area, and neither had any connection to Navy training or testing, nor does the commenter offer any example of large oil spills related to Navy training or testing activities. The Exxon Valdez spilled occurred in Alaska as a result of improper ship manning and handling, and

the Cosco Busan incident that occurred in San Francisco resulted from an impaired pilot. Neither incident is connected to Navy training and testing.

Comment 59: The Animal Legal Defense Fund *et al*. commented that the Navy's analysis cannot be limited only to direct effects, *i.e*., effects that occur at the same time and place as the training exercises that would be authorized, but must also take into account the activity's indirect effects. The commenters assert that this requirement is critical given the potential for sonar exercises to cause significant long-term impacts not clearly observable in the short term.

Response: NMFS and the Navy analyzed both direct and indirect effects from Navy training and testing activities. A discussion of potential indirect effects may be found in the proposed rule (see Potential Effects of Specified Activities on Marine Mammals) and this rule (see Analysis and Negligible Impact Determination). As depicted in the NWTT FEIS/OEIS Figure G-1 in Appendix G (Biological Resource Methods), the Navy's analysis also considers all potential impacts resulting from exposure to acoustic sources, including indirect effects. In Figure G-1, the effects are shown in terms of physiological responses, behavioral responses, potential costs to the animal, recovery, and long-term consequences.

With respect to long-term impacts, see the discussion in Section 3.4.3.1.9 of the NWTT FEIS/OEIS (Long-Term Consequences to the Individual and the Population) and the *Long-Term Consequences* section of this rule. Also see Section 3.4.4.1 (Summary of Monitoring and Observations During Navy Activities) of the NWTT FEIS/OEIS presenting the evidence collected from the intensive monitoring of Navy training and testing at range complexes nationwide since 2006 which provides support for the

conclusions that it is unlikely there would be any population level or long-term consequences resulting from the proposed training and testing activities and implementation of this final rule. The scientific authorities presented in the comment (the National Research Council) are discussed in the NWTT FEIS/OEIS, and do not support the contention that there is a link between the use of sonar and any population-level effects. For example, the number of blue whales has been increasing at 3% annual rate in the Southern California waters where the most frequent and intensive sonar use occurs in the Pacific (Calambokidis *et al*., 2009a). For further examples see our Response to Comment 61.

Comment 60: The Animal Legal Defense Fund *et al*. commented that NMFS failed to adequately assess the cumulative impacts of the Navy's activities in its negligible impact determination. More specifically, see the commenters' four comments in Comments 61 to 64 below.

Response: Section 101(a)(5)(A) of the MMPA requires NMFS to make a determination that the take incidental to a specified activity will have a negligible impact on the affected species or stocks of marine mammals, and will not result in an unmitigable adverse impact on the availability of marine mammals for taking for subsistence uses. Neither the MMPA nor NMFS' implementing regulations specify how to consider other activities and their impacts on the same populations. However, consistent with the preamble for NMFS' implementing regulations (54 FR 40338, September 29, 1989), the impacts from other past and ongoing anthropogenic activities are incorporated into the negligible impact analysis via their impacts on the

environmental baseline (e.g., as reflected in the density/distribution and status of the species, population size and growth rate, and ambient noise).

As discussed in the Analysis and Negligible Impact determination section of this final rule, Chapter 4 of the NWTT FEIS/OEIS contains a comprehensive assessment of potential cumulative impacts, including analyzing the potential for cumulatively significant impacts to the marine environment and marine mammals. The Navy used the best available science and a comprehensive review of past, present, and reasonably foreseeable actions to develop a robust cumulative impacts analysis. The cumulative impacts analysis focused on impacts that are "truly meaningful." This was accomplished by reviewing the direct and indirect impacts that have the potential to occur on each resource under each of the alternatives. Key factors considered were the current status and sensitivity of the resource and the intensity, duration, and spatial extent of the impacts of each potential stressor. In general, long-term rather than short-term impacts and widespread rather than localized impacts were considered more likely to contribute to cumulative impacts. Those impacts to a resource that were considered to be negligible were not considered further in the analysis. As required under NEPA, the level and scope of the analysis are commensurate with the potential impacts of the action as reflected in the resource-specific discussions in Chapter 3 of the NWTT FEIS/OEIS (Affected Environment and Environmental Consequences). The NWTT FEIS/OEIS considered its activities alongside those of other activities in the region whose impacts are truly meaningful to the analysis.

In addition, NMFS' Biological Opinion concludes that NMFS' proposed rulemaking and LOAs and any take associated with activities authorized by the

rulemaking and LOAs are not likely to jeopardize the continued existence of threatened or endangered species (or species proposed for listing) in the action area during any single year or as a result of the cumulative impacts of a 5-year authorization. The Biological Opinion includes an explanation of how the results of NMFS' baseline and effects analyses in Biological Opinions relate to those contained in the cumulative impact section of the NWTT FEIS/OEIS.

Comment 61: The Animal Legal Defense Fund *et al*. assert that there is a lack of any population analysis or quantitative assessment of long-term effects in the proposed rule. Several other commenters also suggested that NMFS and the Navy underestimate the effects of the Navy's activities and fail to consider longer term effects or conduct a population-level analysis.

Response: NMFS disagrees that impacts to marine mammals from the Navy's training and testing activities are underestimated. The Navy's model uses the best available science to analyze impacts and often overestimates the potential effects of their activities by considering the worst case scenario (e.g., modeling for the loudest sound source within a source bin). Further,

NMFS and the Navy fully considered potential long-term and population-level effects. Analysis of these effects is presented in the NWTT FEIS/OEIS in Section 3.4.3.1.9 (Long-Term Consequences to the Individual and the Population) and in the Analysis and Negligible Impact Determination in this final rule (see *Long-Term Consequences* and *Final Determination* sections). NMFS' assessment is that the Navy training and testing activities involving active sonar or underwater detonations are infrequent, short-term, and generally unit level. Unit level events occur over a small spatial scale (one to a few 10s

of square miles) and with few participants (usually one or two). Consequently, the Navy's activities do not create conditions of chronic, continuous underwater noise and are unlikely to lead to habitat abandonment or long-term hormonal or physiological stress responses in marine mammals. Based on the findings from surveys in Puget Sound and research efforts and monitoring before, during, and after training and testing events across the Navy since 2006, NMFS' assessment is that it is unlikely there would be impacts to populations of marine mammals having any long-term consequences as a result of the proposed continuation of training and testing in the ocean areas historically used by the Navy, including the Study Area. NMFS concludes that exposures to marine mammal species and stocks due to NWTT activities would result in primarily short-term (temporary and short in duration) and relatively infrequent effects to most individuals exposed, and not of the type or severity that would be expected to be additive for the portion of the stocks and species likely to be exposed.

Additionally, NMFS notes that, even in areas where the Navy uses sonar frequently, such as instrumented ranges, marine mammal populations are present, not diminishing, and in some cases, thriving. NMFS and the Navy relied on actual trends in marine mammal populations and the best available science regarding marine mammals, including behavioral response studies and the satellite tracking of tagged marine mammals in areas of higher sonar use.

NMFS has reporting and monitoring data from the Navy on training and testing events occurring around the U.S. since 2006. For example, results from 2 years (2009–2010) of intensive monitoring by independent scientists and Navy observers in Southern California Range Complex and Hawaii Range Complex recorded an estimated 161,894

marine mammals with no evidence of distress or unusual behavior observed during Navy activities. Additional information and data summarized in the NWTT FEIS/OEIS Section 3.4.4.1 (Summary of Monitoring and Observations During Navy Activities) provide support for the conclusions that it is unlikely there would be any population level or long-term consequences resulting from implementation of final rule.

Comment 62: The Animal Legal Defense Fund *et al*. commented that NMFS does not consider the potential for acute synergistic effects from multiple Navy activities taking place at one time, or from Navy activities in combination with other actions. As an example, the Commenters state that NMFS does not consider the greater susceptibility to vessel strike of animals that have been temporarily harassed or disoriented. The commenters cite a Nowacek *et al*. (2004) study in which exposure to a mid-frequency sound source provoked interruption of foraging dives and the surfacing of five North Atlantic right whales and presumably increased risk of vessel strike.

Response: The Navy's and NMFS' analysis and acoustic impact modeling does consider and quantify the potential for additive effects from multiple activities involving acoustic stressors. Unlike the method used previously that modeled acoustic sources individually, the Navy's acoustic effects model (NAEMO) has the capability to run all sound sources within a scenario simultaneously, which accounts for accumulative sound and provides a more realistic depiction of the potential effects of an activity (See Section 3.4..3.1.14.3 (Navy Acoustic Effects Model) of the NWTT FEIS/OEIS).

In addition, there is no scientific basis for the suggestion that animals taken by harassment would have "greater susceptibility to vessel strike." NMFS considered Nowacek *et al*. (2004), cited by the commenters, which is discussed in the NWTT

FEIS/OEIS (Section 3.4.3.1.6.2, Behavioral Reactions to Sonar and Other Active Acoustic Sources). Unlike Navy sonar, the sound source used in the Nowacek *et al*. (2004) study was intended to be an alarm signal that lasted several minutes in duration, and was purposely designed to elicit a reaction from the animals as a prospective means to protect them from ship strikes. In contrast, Navy sonar is used intermittently for short durations, and is not aimed at or designed to be an alarm signal for low frequency mysticetes. In addition, the experimental sound source used in the Nowacek study had an extremely different frequency, duration, and temporal pattern of signal presentation from anything used by or proposed for use by the Navy. Of note, and in contrast to the comment's assertion, an equally plausible interpretation of the study is that an active mid-frequency sound source could potentially alert marine mammals to the presence of a Navy vessel and therefore reduce the potential for ship strikes.

Regarding ship strike generally, see the Response to Comment 20.

Comment 63: The Animal Legal Defense Fund *et al*. commented that proposed rule makes no attempt to analyze the cumulative and synergistic effects of the Navy's proposed activities or for the Navy's activities combined with other activities affecting the same marine mammal species and populations, and NMFS makes no attempt to incorporate the effects of reasonably foreseeable activities impacting the same species and populations into its impact analysis.

Response: As described in the Response to Comment 62, the Navy's acoustic impact modeling does consider and quantify the potential for additive effects from multiple activities involving acoustic stressors by modeling all sound sources within a scenario simultaneously, which accounts for accumulative sound and provides a more

realistic depiction of the potential effects of an activity. Further, as explained throughout this rule, NMFS' assessment is that the cumulative impacts of active sonar would be extremely small because the exercises would occur for relatively short periods of time; the sources of active sonar would most often not be stationary; and the effects of any LF/MFAS/HFAS exposure would stop when transmissions stop. Additionally, the vast majority of impacts expected from sonar exposure and underwater detonations are behavioral in nature, temporary and comparatively short in duration, relatively infrequent, and not of the type or severity that would be expected to be additive for the portion of the stocks and species likely to be exposed. NMFS' final rule is specifically designed to reduce the effects of the Navy's activity on marine mammal species and stocks to the least practicable impact, through the inclusion of appropriate mitigation and monitoring measures, and the issuance of an Authorization with those conditions does not result in significant cumulative impacts when considered with all other past, present, and reasonably foreseeable projects.

Chapter 4 of the NWTT FEIS/OEIS contains a comprehensive assessment of potential cumulative impacts, including analyzing the potential for cumulatively significant impacts to the marine environment and marine mammals. Specifically, the Navy concluded, and NMFS concurs, that their proposed action is likely to result in generally no more than temporary changes to the noise environment and sediment and water quality. Therefore, there is limited potential for those effects to interact cumulatively with the effects of other past, present, and reasonably foreseeable projects. Implementation of the proposed action, in conjunction with other past, present, and reasonably foreseeable future actions, would not be expected to result in significant

cumulative impacts to the environment. As such, the proposed action will not result in cumulative adverse effects that could have a substantial effect on species and populations in the action area.

In addition, we note that the Navy has been training in the same relative area for decades using substantially similar training and testing systems for decades, and coupled with the multitude of other activities taking place in the area, there is no evidence of long term consequences to marine mammal populations or stocks.

Comment 64: The Animal Legal Defense Fund *et al*. commented that NMFS must account for the additive impact of its activities in light of changing ocean conditions.

Response: NMFS and the Navy have considered changing ocean conditions. As discussed in the NWT FEIS/OEIS (Section 3.4, Marine Mammals), NMFS and the Navy are aware that marine mammals will shift their habitat based on changing ocean conditions. Please see specifically Section 3.4.2.5 (Marine Mammal Density Estimates) of the NWTT FEIS/OEIS discussing the integration of habitat modeling into the analysis; also see the Navy's Pacific Marine Species Density Database Technical Report. The predictive habitat models reflect the interannual variability and associated redistribution of marine mammals as a result of changing environmental conditions during the survey years used to develop the models. The analysis presented in the Navy Marine Species Density Database includes density data for periods of warmer water and potentially shifting ranges of marine mammals as a result of those conditions.

While climate change may result in changes in the distribution of marine mammals, it is currently not possible to predict how or under what conditions such changes might occur without engaging in unsupported conjecture. Therefore, it is not

possible to reasonably determine what hypothetical future marine mammal distributions may look like as a result of climate change or otherwise factor such changes into an analysis of resulting potential effects and impacts from Navy activities.

Comment 65: The Animal Legal Defense Fund *et al*., and other commenters, commented that NMFS failed to properly analyze the potential for serious injury and mortality, particularly with regard to sonar-related injury and mortality (*i.e*., strandings) during the Navy's use of mid-frequency active sources and other sources. The commenters cited several stranding events (e.g., Bahamas, 2000; Washington State, 2003) that they assert occurred coincident with military mid-frequency sonar use. The Animal Legal Defense Fund *et al.* commented that beaked whales "seem to be particularly vulnerable to the effects of active sonar" and that beaked whale mortalities are likely to go undetected.

Response: NMFS uses best available science to analyze the Navy's activities. The Stranding and Mortality section of the proposed rule (80 FR 31738, June 3, 2015; pages 31761-31767) summarized the stranding events referenced in the Animal Legal Defense Fund *et al*.'s comment, including the association between stranding events and exposure to MFAS. Also, see the NWTT FEIS/OEIS Section 3.4.1.8 (Stranding) and the U.S. Department of the Navy (2013c) "Marine Mammal Strandings Associated with U.S. Navy Sonar Activities" technical report available at *http://www.nwtteis.com*. The modeling of acoustic effects takes into consideration all applicable environmental factors and all applicable sound sources to predict the likely effects to beaked whales and all other species. Please also see Southall *et al*. (2007), Finneran and Jenkins (2012), and the NWTT FEIS/OEIS Section 3.4.3.1.11 (Frequency Weighting) to understand the

implementation of frequency weighting as it applies to the analysis of effects from mid-frequency and high frequency sound sources.

The environmental conditions in the NWTT Study Area and the types of activities proposed in the NWTT FEIS/OEIS have no relationship to those present in the Bahamas incident fourteen years ago in unique and warm tropical waters. The environmental conditions otherwise differentiating the Atlantic tropical Bahamas environment present in 2000 from the Pacific Northwest NWTT Study Area include the unique bathymetry of the Bahamas Providence Channels that are steep sided, narrow, and very deep - ranging from approximately 2,000 to 12,000 in depth. On that day in 2000 in the Bahamas, there was also a 200 meter thick layer of near constant water temperature, calm seas, as well as the presence of beaked whales. The Strait of Juan de Fuca, by comparison, is not steep sided, is relatively shallow (approximately 600 feet depth), is unlikely to ever have a uniformly mixed thermocline, and beaked whales are not known to inhabit its waters. Additionally and also unlike the Bahamas, there will be no Navy training or testing activities involving multiple ships using hull mounted tactical mid-frequency active sonar over an extended period of time in a single area.

With regard to the harbor porpoise strandings in Washington State (2003), NMFS has since determined that these strandings were unrelated to Navy sonar use. There was a lack of evidence of any acoustic trauma among the harbor porpoises, and the identification of probable causes (e.g., entanglement in a fishing net, disease processes) of stranding or death in several animals supports the conclusion that the harbor porpoise strandings were unrelated to the sonar activities by the USS SHOUP. Refer to the discussion in the NWTT FEIS/OEIS Section 3.4.1.8 (Stranding) and the U.S. Department

of the Navy (2013c) "Marine Mammal Strandings Associated with U.S. Navy Sonar Activities" technical report for a discussion of other previous strandings and note that the other stranding events in this comment did not occur in, and were not associated with, the NWTT Study Area and did not involve any of the training or testing scenarios proposed for the NWTT Study Area.

Lastly, while not referenced by the commenters and not related to active sonar exposure, NMFS considered an investigation into a long-finned pilot whale mass stranding event at Kyle of Durness, Scotland on July 22, 2011 (Brownlow *et al*., 2015). The investigation considered unexploded ordnance detonation activities at a Ministry of Defense bombing range, conducted by the Royal Navy prior to and during the strandings, as a plausible contributing factor in the mass stranding event. While Brownlow *et al*. (2015) concluded that the serial detonations of underwater ordnance were an influential factor in the mass stranding event (along with presence of a potentially compromised animal and navigational error in a topographically complex region) they also suggest that mitigation measures—which included observations from a zodiac only and by personnel not experienced in marine mammal observation, among other deficiencies—were likely insufficient to assess if cetaceans were in the vicinity of the detonations. The authors also cite information from the Ministry of Defense indicating "an extraordinarily high level of activity" (i.e., frequency and intensity of underwater explosions) on the range in the days leading up to the stranding.

The NWTT FEIS/OEIS provides an analysis of potential impacts occurring in the NWTT Study Area. While most of the world's coastlines lack coverage by a stranding network, the Navy's analysis of impacts has focused on scientific data collected in and

around the Navy range complexes, which are the proposed locations for the continuation of historically occurring training and testing activities including the use of sonar. A summary of the compendium of the research in that regard is presented in NWTT FEIS/OEIS in Section 3.4.4.1 (Summary of Monitoring and Observations During Navy Activities). Unlike the rest of the world's oceans, there has not been an absence of observation where the U.S. Navy has been routinely training and testing for years. In particular and as ongoing for approximately the last 8 years, the Navy, NMFS, and an independent group of scientists have been engaged in implementing a comprehensive monitoring program and associated research that includes monitoring before, during, and after Navy activities on U.S. Navy range complexes. In short, the research and monitoring associated with Navy training and testing activities makes the Navy range complexes different than the remainder of the world's oceans.

For beaked whales in particular, not only have there been no mortalities or strandings associated with Navy sonar use during the past approximately 8 years of monitoring, but to the contrary there has been overwhelming evidence from research and monitoring indicating the continued presence or residence of individuals and populations in Navy range complexes and no clear evidence indicating long-term effects from Navy training and testing in those locations. For example, photographic records spanning more than 2 decades demonstrated re-sightings of individual beaked whales (from two species: Cuvier's and Blainville's beaked whales), suggesting long-term site fidelity to the area west of the Island of Hawaii where intensive swept-channel exercises historically occurred (McSweeney *et al*., 2007). In the most intensively used training and testing ranges in the Pacific, photo identification of animals associated with the SOCAL Range

Complex have identified approximately 100 individual Cuvier's beaked whale individuals with 40 percent having been seen in one or more prior years, with re-sightings up to 7 years apart (Falcone and Schorr, 2014). Data from visual surveys documenting the presence of Cuvier's beaked whales for the ocean basin west of San Clemente Island (Falcone *et al*., 2009; Falcone and Schorr, 2012, 2014; Smultea and Jefferson, 2014) is also consistent with concurrent results from passive acoustic monitoring that estimated regional Cuvier's beaked whale densities were higher than indicated by NMFS's broad scale visual surveys for the United States west coast (Hildebrand and McDonald, 2009). Falcone and Schorr (2012) suggested that these beaked whales may have population sub-units with higher than expected residency to the Navy's instrumented Southern California Anti-Submarine Warfare Range in particular. For over 3 decades, this ocean area west of San Clemente has been the location of the Navy's instrumented training range and is one of the most intensively used training and testing areas in the Pacific, given the proximity to the Naval installations in San Diego. In summary, the best available science indicates the Navy's continued use of Navy range complexes have not precluded beaked whales from also continuing to inhabit areas where sonar use has been occurring, and there is no evidence to suggest that undocumented mortalities are occurring in the NWTT Study Area or on the range complexes where the U.S. Navy routinely conducts training and testing activities.

In the NWTT FEIS/OEIS, the sensitivity of beaked whales is taken into consideration both in the application of Level B harassment thresholds and in how beaked whales are expected to avoid sonar sources at higher levels. No beaked whales were predicted in the acoustic analysis to be exposed to sound levels associated with

PTS, other injury, or mortality (note: there is no data from which to develop or set a mortality criterion and there is no evidence that sonar can lead to a direct mortality due to lack of a shock wave). After decades of the Navy conducting similar activities in the NWTT Study Area without incident, NMFS does not expect strandings, injury, or mortality of beaked whales or any other species to occur as a result of training and testing activities. Additionally, through the MMPA rulemaking (which allows for adaptive management), NMFS and the Navy will determine the appropriate way to proceed in the event that a causal relationship were to be found between Navy activities and a future stranding.

Comment 66: The Animal Legal Defense Fund *et al*. commented that NMFS dismisses the leading explanation about the mechanism of sonar-related injuries—that whales suffer from bubble growth in organs that is similar to decompression sickness, or "the bends" in human divers—as one of several controversial hypotheses. They cite numerous papers in support of this explanation.

Response: The comment assumes injury from sonar use, and discounts the best available science. The publications cited for this comment are generally old and do not constitute the most recent best available science in this subject area. Please see the Navy's NWTT FEIS/OEIS Section 3.4.3.1.2.1 (Direct Injury) in general and specifically Section 3.4.3.1.2.2 (Nitrogen Decompression) where the latest scientific findings have been presented.

NEPA

Comment 67: The Animal Legal Defense Fund *et al*. commented that NMFS cannot rely on adoption of the Navy's NWTT FEIS/OEIS to fulfill its obligation under

NEPA due to the inadequacy of the document. The Sun'aq Tribe of Kodiak commented that NMFS has not independently fulfilled its NEPA obligations. Some of the commenters also submitted or referenced comments on the NWTT DEIS/OEIS that were submitted to the Navy during the public comment period on that document.

Response: NMFS disagrees with the commenters' assertion that the NWTT FEIS/OEIS is inadequate for our adoption and to meet our responsibilities under NEPA for the issuance of regulations and LOAs, or that NMFS has not fulfilled its NEPA obligations. NMFS notes that comments submitted on the NWTT DEIS/OEIS during its public comment period are addressed by the Navy in Appendix I of the NWTT FEIS/OEIS.

NMFS' Office of Protected Resources has thoroughly reviewed the Navy's NWTT FEIS/OEIS and concluded that the impacts evaluated by the Navy are substantially the same as the impacts of NMFS' proposed action to issue regulations (and associated LOAs) governing the take of marine mammals incidental to Navy training and testing activities in the NWTT Study Area from November 2015 through November 2020. In addition, the Office of Protected Resources has evaluated the NWTT FEIS/OEIS and found that it includes all required components for adoption by NOAA including: a discussion of the purpose and need for the action; a listing of the alternatives to the proposed action; a description of the affected environment; a succinct description of the environmental impacts of the proposed action and alternatives, including cumulative impacts; and a listing of agencies and persons consulted, and to whom copies of the FEIS are sent.

Per the cooperating agency commitment, the Navy provided NMFS with early preliminary drafts of the NWTT DEIS/OEIS and the FEIS/OEIS and a designated (and adequate) timeframe within which NMFS could provide comments. The Office of Protected Resources circulated the Navy's preliminary NEPA documents to other interested NOAA line offices and NMFS' regional and science center offices, compiled any comments received, and submitted them to the Navy. Subsequently, the Navy and NMFS participated in comment resolution meetings, in which the Navy addressed NMFS' comments, and in which any outstanding issues were resolved. The Navy has incorporated the majority of NMFS' comments into the FEIS, and adequately addressed those comments that were not incorporated. As a result of this review, the Office of Protected Resources has determined that it is not necessary to prepare a separate Environmental Assessment or EIS to issue regulations or LOAs authorizing the incidental take of marine mammals pursuant to the MMPA, and that adoption of the Navy's NWTT FEIS/OEIS is appropriate. Based on NMFS' review of the FEIS, NMFS has adopted the FEIS under the Council on Environmental Quality's Regulations for Implementing the National Environmental Policy Act (40 CFR 1506.3). Furthermore, in accordance with NEPA, its implementing regulations, and the NOAA's Administrative Order (NAO) 216-6 "Environmental Review Procedures for Implementing the National Environmental Policy Act," we have prepared a Record Decision (ROD) which addresses NMFS' determination to issue regulations and LOAs to the Navy pursuant to section 101(a)(5)(A) of the MMPA, for the taking of marine mammals incidental to the conduct of Navy's training and testing activities.

Comment 68: Several commenters felt that the Navy should wait until after the

NEPA process is complete and a Record of Decision (ROD) signed before requesting an incidental take authorization from NMFS.

Response: The Navy prepared the NWTT FEIS/OEIS in accordance with the President's CEQ regulations implementing NEPA (40 C.F.R. 1500–1508). NEPA (42 U.S.C. §§ 4321–4347) requires federal agencies to prepare an EIS for a proposed action with the potential to significantly affect the quality of the human environment, disclose significant environmental impacts, inform decision makers and the public of the reasonable alternatives to the proposed action, and consider comments to the EIS. The Navy initiated (i.e., submitted a request for regulations and Letters of Authorization) MMPA consultation with NMFS early on in the NEPA process, so that development of both the FEIS/OEIS, of which NMFS is a cooperating agency because of its expertise and regulatory authority over marine resources, and the rule could occur concurrently. Moreover, because the FEIS/OEIS must also be prepared in accordance with the applicable regulations of the MMPA (and ESA) to evaluate all components of the proposed training and testing activities that have the potential to take marine mammals, the Navy cannot select its preferred alternative, or issue its final decision through the ROD, until all the regulatory requirements of the MMPA have been met and the regulations to take marine mammals incidental to the proposed activities has been issued. Note that NMFS did not issue these regulations until the Navy released the NWTT FEIS/OEIS to the public and allowed the public to comment on the notice of availability (NOA). Further, NMFS fully considered any relevant comments on the NOA prior to the finalization of this rule and the issuance of regulations.

Comment 69: One commenter questioned why the Navy's NWTT DEIS/OEIS

would include an assessment of the effects on the human environment.

Response: An EIS is required when there is the potential for a proposed action to have a significant impact on the human environment (40 C.F.R. § 1508.18). NEPA requires that the human environment shall be interpreted comprehensively to include the natural and physical environment and the relationship of people with that environment (40 C.F.R. § 1508.14). When an EIS is prepared and economic or social and natural or physical environmental effects are interrelated, then the environmental impact statement will discuss all of these effects on the human environment.

General Opposition

Comment 70: The vast majority of comments received by NMFS were from commenters expressing general opposition to Navy training and testing activities and NMFS' issuance of an MMPA authorization. Many commenters claimed that the Navy's activities would result in the "killing of marine mammals" or the "deaths of thousands of marine mammals" during NWTT training and testing activities using sonar.

Response: NMFS appreciates the commenters' concern for the marine environment. However, the commenters' assertion that the Navy's activities in the NWTT Study Area will result in the deaths of thousands of marine mammals is incorrect. As discussed throughout this rule and in the NWTT FEIS/OEIS, the vast majority of predicted takes are by behavioral harassment (behavioral reactions and TTS), and there are no mortality takes predicted or authorized for any training or testing activities in the NWTT Study area. Further, any impacts from the Navy's activities are expected to be short term and would not result in significant changes in behavior, growth, survival, annual reproductive success, lifetime reproductive success (fitness), or species

recruitment. The Navy has conducted active sonar training and testing activities in the Study Area for decades, and there is no evidence that routine Navy training and testing has negatively impacted marine mammal populations in the Study Area or at any Navy Range Complex. Based on the best available science, NMFS has determined that the Navy's training and testing activities will have a negligible impact on the affected species or stocks and, therefore, we plan to issue the requested MMPA authorization.

Comment 71: Several commenters opposed the Navy's activities within Olympic National Park.

Response: The Navy does not conduct any ship or submarine activities, including active sonar or explosives training and testing, within Olympic National Park. Other Navy activities within the Park would not impact marine resources. As such, these concerns are outside the scope of this rulemaking.

General

Comment 72: Some commenters requested access to, or copies of, NMFS' response to public comments on the proposed rule. Other commenters voiced concerns with the difficulty of viewing documents in person at NMFS headquarters in Silver Spring, MD.

Response: As stated in the Addresses section of the proposed rule, all comments received on the proposed rule are part of the public record and are posted for public viewing on *www.regulations.gov* without change. NMFS' responses to these comments are set forth in this **Federal Register** notice. All documents prepared as part of the rulemaking, including the Navy's LOA application, **Federal Register** notices of the proposed and final rules, the issued LOAs, and related NMFS NEPA documents, may be

obtained by visiting the internet at: *http://nmfs.noaa.gov/pr/permits/incidental/military.htm*. The Navy's NWTT FEIS/OEIS and supporting technical documents (*e.g*., Criteria and Thresholds for U.S. Navy Acoustic and Explosive Effects Analysis Technical Report) are available at http://*www.nwtteis.com*.

Comment 73: One commenter requested that NMFS provide a "master list" of all species-specific takes currently authorized by NMFS for all activities, whether military or non-military, occurring annually in the Atlantic and Pacific oceans and Gulf of Mexico. The same commenter requested that NMFS assess the cumulative effects of all military and non-military activities in the Atlantic and Pacific oceans and Gulf of Mexico for which an MMPA authorization has been issued.

Response: This request is beyond the scope of this rulemaking; however, all currently active MMPA authorizations issued by NMFS, and associated NEPA documents, may be obtained by visiting the internet at: *http://www.nmfs.noaa.gov/pr/permits/incidental*. Each incidental take authorization provides a list of annual takes for each species authorized to be taken for a given activity.

Comment 74: Several people commented on other active rulemakings and LOAs for Navy training and testing activities, including HSTT, NWTRC, and AFTT.

Response: These comments are beyond the scope of this rulemaking. Commenters with concerns or questions regarding other Navy training and testing activities and related MMPA authorizations should visit NMFS' website at: *http://www.nmfs.noaa.gov/pr/permits/incidental/military.htm*.

Comment 75: One commenter suggested that Navy training and testing activities could be significantly reduced while still maintaining military readiness.

Response: The Navy has identified the level of training and testing activities necessary to meet its legally mandated requirements. As described in Section 5.3.4.1.1 of the NWTT FEIS/OEIS, the Navy's proposed training activities do not include training beyond levels required for maintaining satisfactory levels of readiness due to the need to efficiently use limited resources (e.g., fuel, personnel, and time). Section 101(a)(5)(A) of the MMPA directs the Secretary of Commerce to allow, upon request, the incidental taking of small numbers of marine mammals if certain findings are made and regulations are issued. NMFS has made the requisite findings and therefore must issue regulations and LOAs for the Navy's activities.

Estimated Take of Marine Mammals

In the Estimated Take of Marine Mammals section of the proposed rule, NMFS described the potential effects to marine mammals from active sonar and underwater detonations in relation to the MMPA regulatory definitions of Level A and Level B harassment (80 FR 31738, June 3, 2015, pages 31785-31790). That information has not changed and is not repeated here. It is important to note that, as Level B Harassment is interpreted here and quantified by the behavioral thresholds described below, the fact that a single behavioral pattern (of unspecified duration) is abandoned or significantly altered and classified as a Level B take does not mean, necessarily, that the fitness of the harassed individual is affected either at all or significantly, or that, for example, a preferred habitat area is abandoned. Further analysis of context and duration of likely exposures and effects is necessary to determine the impacts of the estimated effects on

individuals and how those may translate to population-level impacts, and is included in the Analysis and Negligible Impact Determination.

Tables 11 and 12 provide a summary of non-impulsive and impulsive thresholds to TTS and PTS for marine mammals. Behavioral thresholds for impulsive sources are summarized in Table 13. A detailed explanation of how these thresholds were derived is provided in the NWTT FEIS/OEIS Criteria and Thresholds Technical Report (*http://www.nwtteis.com*) and summarized in Chapter 6 of the LOA application (*http://www.nmfs.noaa.gov/pr/permits/incidental/military.htm*).

Table 11. Onset TTS and PTS thresholds for non-impulse sound.

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

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

Table 12. Impulsive sound and explosive criteria and thresholds for predicting injury and mortality.

Group	Species	Onset TTS	Onset PTS	Onset Slight GI Tract Injury	Onset Slight Lung Injury	Onset Mortality
Low Frequency Cetaceans	All mysticetes	172 dB re 1 μPa^2-s SEL (Type II weighting) or 224 dB re 1 μPa Peak SPL (unweighted)	187 dB re 1 μPa^2-s SEL (Type II weighting) or 230 dB re 1 μPa Peak SPL (unweighted)	237 dB re 1 μPa (unweighted)	Note 1	Note 2
Mid-Frequency Cetaceans	Most delphinids, medium and large toothed whales	172 dB re 1 μPa^2-s SEL (Type II weighting) or 224 dB re 1 μPa Peak SPL (unweighted)	187 dB re 1 μPa^2-s SEL (Type II weighting) or 230 dB re 1 μPa Peak SPL (unweighted)			
High Frequency Cetaceans	Porpoises and *Kogia* spp.	146 dB re 1 μPa^2-s SEL (Type II weighting) or 195 dB re 1 μPa Peak SPL (unweighted)	161 dB re 1 μPa^2-s SEL (Type II weighting) or 201 dB re 1 μPa Peak SPL (unweighted)			
Phocidae	Northern elephant seal and harbor seal	177 dB re 1 μPa^2-s (Type I weighting) or 212 dB re 1 μPa Peak SPL (unweighted)	192 dB re 1 μPa^2-s (Type I weighting) or 218 dB re 1 μPa Peak SPL (unweighted)			
Otariidae	Steller and California Sea Lion, Guadalupe and Northern fur seal	200 dB re 1 μPa^2-s (Type I weighting) or 212 dB re 1 μPa Peak SPL (unweighted)	215 dB re 1 μPa^2-s (Type I weighting) or 218 dB re 1 μPa Peak SPL (unweighted)			
Mustelidae	Sea Otter					
Note 1 $= 39.1M^{1/3}\left(1+\frac{D_{Rm}}{10.081}\right)^{1/2} Pa-\sec$			Note 2 $= 91.4M^{1/3}\left(1+\frac{D_{Rm}}{10.081}\right)^{1/2} Pa-\sec$			

[1] Impulse calculated over a delivery time that is the lesser of the initial positive pressure duration or 20 percent of the natural period of the assumed-spherical lung adjusted for animal size and depth.
Notes: GI = gastrointestinal, M = mass of animals in kilograms, D_{Rm} = depth of receiver (animal) in meters, SEL = Sound Exposure Level, SPL = Sound Pressure Level (re 1 μPa), dB = decibels, re 1 μPa = referenced to one micropascal, dB re 1 μPa^2-s = decibels referenced to one micropascal squared second

Table 13. Behavioral thresholds for impulsive sound.

Hearing Group	Impulsive Behavioral Threshold for > 2 pulses/24 hours
Low-Frequency Cetaceans	167 dB SEL (LF_{II})
Mid-Frequency Cetaceans	167 dB SEL (MF_{II})
High-Frequency Cetaceans	141 dB SEL (HF_{II})
Phocid Seals (in water)	172 dB SEL (P_{WI})
Otariidae & Mustelidae (in water)	195 dB SEL (O_{WI})

Notes: (1) $LF_{II,}$ $MF_{II,}$ HF_{II} are New compound Type II weighting functions; $P_{WI,}$ O_{WI} = Original Type I (Southall *et al*. 2007) for pinniped and mustelid in water (see Finneran and Jenkins 2012). (2) SEL = re 1 μPa^2-s; SEL = Sound Exposure Level, dB = decibel

Take Request

The NWTT FEIS/OEIS considered all training and testing activities proposed to occur in the Study Area that have the potential to result in the MMPA defined take of marine mammals. The potential stressors associated wsith these activities included the following:

- Acoustic (sonar and other active non-impulse sources, explosives, swimmer defense airguns, weapons firing, launch and impact noise, vessel noise, aircraft noise);
- Energy (electromagnetic devices);
- Physical disturbance or strikes (vessels, in-water devices, military expended materials, seafloor devices);
- Entanglement (fiber optic cables, guidance wires, parachutes);
- Ingestion (munitions, military expended materials other than munitions); and
- Secondary stressors (sediments and water quality).

NMFS has determined that two stressors could potentially result in the incidental taking of marine mammals from training and testing activities within the Study Area: (1) non-impulsive stressors (sonar and other active acoustic sources) and (2) impulsive stressors (explosives). Non-impulsive and impulsive stressors have the potential to result in incidental takes of marine mammals by harassment, injury, or mortality. NMFS also considered the potential for vessel strikes to impact marine mammals, and that assessment is presented below.

In order to account for the accidental nature of vessel strikes to large whales in general, and the potential risk from any vessel movement within the NWTT Study Area, lethal takes of large whales were originally conservatively requested in the Navy's original LOA application for NWTT training and testing activities over the 5-year period of NMFS' final authorization. However, after further consideration of the Navy's ship strike analysis, the unlikelihood of a ship strike to occur and the fact that there has never been a ship strike to marine mammals in the Study Area, the Navy removed their request for mortality takes from vessel strike in the final LOA application. Therefore, NMFS is not authorizing takes (by injury or mortality) from vessel strikes during the 5-year period of the NWTT regulations, as discussed below.

Training Activities

A detailed analysis of effects due to marine mammal exposures to impulsive and non-impulsive sources in the Study Area is presented in Chapter 6 of the LOA application. Based on the model and post-model analysis described in Chapter 6 of the LOA application, Table 14 summarizes the authorized takes for training activities for a year (a 12-month period) and the summation over a 5-year period (annual events

occurring five times and the non-annual event occurring three times). The Civilian Port Defense exercise (Maritime Homeland Defense/Security Mine Countermeasure exercise) is a non-annual event and is analyzed as occurring every other year, or three times during the 5-year period considered in this analysis. Annual totals presented in the tables are the summation of all annual events plus all the proposed non-annual events occurring in a 12-month period as a maximum year.

Table 14. Summary of annual and 5-year takes for NWTT training activities.

MMPA Category	Source	Training Activities	
		Annual Authorization Sought	**5-Year Authorization Sought**
Level A	Impulsive and Non-Impulsive	11 – Species specific data shown in Tables 15 and 67	55 – Species specific data shown in Tables 15 and 16
Level B	Impulsive and Non-Impulsive	107,459 – Species specific data shown in Tables 15 and 16	533,543 – Species specific data shown in Tables 15 and 16

Impulsive and Non-Impulsive Sources

Table 15 provides the Navy's take request for training activities by species from the acoustic effects modeling estimates. The numbers provided in the annual columns are the totals for a maximum year (i.e., a year in which a Civilian Port Defense (Maritime Homeland Defense/Security Mine Countermeasure exercise) occurs). Table 16 provides the contribution to the maximum year total (1,876 Level B exposures) resulting from the biennial Civilian Port Defense exercise (Maritime Homeland Defense/Security Mine Countermeasure exercise). The 5-year totals presented assume the biennial event would occur three times over the 5-year period (in the first, third, and fifth years). Derivations of the numbers presented in Tables 15 and 16 are described in more detail within Chapter 6 of the LOA application. There are no mortalities predicted for any training activities resulting from the use of impulsive or non-impulsive sources. Values shown in Table 15

also include Level B values from non-annual Civilian Port Defense (Maritime Homeland Defense/Security Mine Countermeasure exercise) training events.

Table 15. Species-specific takes from modeling and post-model estimates of impulsive and non-impulsive source effects for all training activities.

Species	Stock	Annual		5-Year	
		Level B	Level A	Level B	Level A
North Pacific right whale	Eastern North Pacific	0	0	0	0
Humpback whale	Central North Pacific	0	0	0	0
	California, Oregon, & Washington	12	0	60	0
Blue whale	Eastern North Pacific	5	0	25	0
Fin whale	Northeast Pacific	0	0	0	0
	California, Oregon, & Washington	25	0	125	0
Sei whale	Eastern North Pacific	0	0	0	0
Minke whale	Alaska	0	0	0	0
	California, Oregon, & Washington	18	0	90	0
Gray whale	Eastern North Pacific	6	0	30	0
	Western North Pacific	0	0	0	0
Sperm whale	North Pacific	0	0	0	0
	California, Oregon, & Washington	81	0	405	0
Kogia (spp.)	California, Oregon, & Washington	73	0	365	0
Killer whale	Alaska Resident	0	0	0	0
	Northern Resident	0	0	0	0
	West Coast Transient	9	0	39	0
	East N. Pacific Offshore	13	0	65	0
	East N. Pacific Southern Resident	2	0	6	0
Short-finned pilot whale	California, Oregon, & Washington	0	0	0	0
Short-beaked common dolphin	California, Oregon, & Washington	734	0	3,670	0
Bottlenose dolphin	California, Oregon, & Washington	0	0	0	0
Striped dolphin	California, Oregon, & Washington	22	0	110	0
Pacific white-sided dolphin	North Pacific	0	0	0	0
	California, Oregon, & Washington	3,482	0	17,408	0
Northern right whale dolphin	California, Oregon, & Washington	1,332	0	6,660	0
Risso's dolphin	California, Oregon, & Washington	657	0	3,285	0
Harbor porpoise	Southeast Alaska	0	0	0	0
	Northern OR/WA Coast	35,006	0	175,030	0
	Northern CA/Southern OR	52,509	0	262,545	0
	WA Inland Waters	1,417	1	4,409	5
Dall's porpoise	Alaska	0	0	0	0
	California, Oregon, & Washington	3,730	4	18,178	20
Cuvier's beaked whale	Alaska	0	0	0	0
	California, Oregon, & Washington	353	0	1,765	0
Baird's beaked whale	Alaska	0	0	0	0
	California, Oregon, & Washington	591	0	2,955	0
Mesoplodon beaked whales	California, Oregon, & Washington	1,417	0	7,085	0
Steller sea lion	Eastern U.S.	404	0	1,986	0
Guadalupe fur seal	Mexico	7	0	35	0
California sea lion	U.S. Stock	814	0	4,038	0
Northern fur seal	Eastern Pacific	2,495	0	12,475	0
	California	37	0	185	0
Northern elephant seal	California Breeding	1,271	0	6,353	0
Harbor seal	Southeast Alaska (Clarence Strait)	0	0	0	0
	OR/WA Coast	0	0	0	0
	California	0	0	0	0

	WA Northern Inland Waters	427	4	1,855	20
	Southern Puget Sound	58	0	252	0
	Hood Canal	452	2	2,054	10

Table 16. Training exposures specific to the Biennial Civilian Port Defense Exercise (Maritime Homeland Defense/Security Mine Countermeasure exercise) (Values provided for informational purposes and are included in Table 15 species-specific totals).

Species	**Stock**	**Biennial**	
		Level B	**Level A**
North Pacific right whale	Eastern North Pacific	0	0
Humpback whale	Central North Pacific	0	0
	California, Oregon, & Washington	0	0
Blue whale	Eastern North Pacific	0	0
Fin whale	Northeast Pacific	0	0
	California, Oregon, & Washington	0	0
Sei whale	Eastern North Pacific	0	0
Minke whale	Alaska	0	0
	California, Oregon, & Washington	0	0
Gray whale	Eastern North Pacific	0	0
	Western North Pacific	0	0
Sperm whale	North Pacific	0	0
	California, Oregon, & Washington	0	0
Kogia (spp.)	California, Oregon, & Washington	0	0
Killer whale	Alaska Resident	0	0
	Northern Resident	0	0
	West Coast Transient	3	0
	East N. Pacific Offshore	0	0
	East N. Pacific Southern Resident	2	0
Short-finned pilot whale	California, Oregon, & Washington	0	0
Short-beaked common dolphin	California, Oregon, & Washington	0	0
Bottlenose dolphin	California, Oregon, & Washington	0	0
Striped dolphin	California, Oregon, & Washington	0	0
Pacific white-sided dolphin	North Pacific	0	0
	California, Oregon, & Washington	1	0
Northern right whale dolphin	California, Oregon, & Washington	0	0
Risso's dolphin	California, Oregon, & Washington	0	0
Harbor porpoise	Southeast Alaska	0	0
	Northern OR/WA Coast	0	0
	Northern CA/Southern OR	0	0
	WA Inland Waters	1,338	0
Dall's porpoise	Alaska	0	0
	California, Oregon, & Washington	236	0
Cuvier's beaked whale	Alaska	0	0
	California, Oregon, & Washington	0	0
Baird's beaked whale	Alaska	0	0
	California, Oregon, & Washington	0	0
Mesoplodon beaked whales	California, Oregon, & Washington	0	0
Steller sea lion	Eastern U.S.	17	0
Guadalupe fur seal	Mexico	0	0
California sea lion	U.S. Stock	16	0
Northern fur seal	Eastern Pacific	0	0

	California	0	0
Northern elephant seal	California Breeding	1	0
Harbor seal	Southeast Alaska (Clarence Strait)	0	0
	OR/WA Coast	0	0
	California	0	0
	WA Northern Inland Waters	140	0
	Southern Puget Sound	19	0
	Hood Canal	103	0

Vessel Strike

There has never been a recorded vessel strike of marine mammals during any training activities in the Study Area. A detailed analysis of strike data is contained in Section 6.7 (Estimated Take of Large Whales by Navy Vessel Strike) of the LOA application. The Navy's proposed actions would not result in any appreciable changes in locations or frequency of vessel activity, and there have been no whale strikes during any previous training activities in the Study Area. The manner in which the Navy has trained would remain consistent with the range of variability observed over the last decade so the Navy does not anticipate vessel strikes would occur within the Study Area during training events. Neither the Navy nor NMFS anticipates vessel strikes of marine mammals within the Study Area, nor were takes by injury or mortality resulting from vessel strike predicted in the Navy's quantitative analysis. Therefore, takes by injury or mortality resulting from vessel strikes are not authorized by NMFS in this final rule. However, the Navy has proposed measures (see Mitigation) to mitigate potential impacts to marine mammals from vessel strikes during training activities in the Study Area.

Testing Activities

A detailed analysis of effects due to marine mammal exposures to impulsive and non-impulsive sources in the Study Area is presented in Chapter 6 of the LOA

application. Based on the model and post-model analysis described in Chapter 6 of the LOA application, Table 17 summarizes the authorized takes for testing activities for an annual (12-month) period and the summation over a 5-year period. There are no non-annual testing events.

Table 17. Summary of annual and 5-year takes for NWTT testing activities.

MMPA Category	Source	Testing Activities	
		Annual Authorization Sought	**5-Year Authorization Sought**
Level A	Impulsive and Non-Impulsive	184 – Species specific data shown in Tables 18	920 – Species specific data shown in Tables 18
Level B	Impulsive and Non-Impulsive	140,377 – Species specific data shown in Tables 18	701,885 – Species specific data shown in Tables 18

Impulsive and Non-Impulsive Sources

Table 18 summarizes the authorized takes for testing activities by species. There are no non-annual testing events. Derivation of these values is described in more detail within Chapter 6 of the LOA application. There are no mortalities predicted for any testing activities based on the analysis of impulsive and non-impulsive sources.

Table 18. Species-specific takes from modeling and post-model estimates of impulsive and non-impulsive source effects for all testing activities.

Species	Stock	Annual		5-Year	
		Level B	**Level A**	**Level B**	**Level A**
North Pacific right whale	Eastern North Pacific	0	0	0	0
Humpback whale	Central North Pacific	1	0	5	0
	California, Oregon, & Washington	44	0	220	0
Blue whale	Eastern North Pacific	6	0	30	0
Fin whale	Northeast Pacific	2	0	10	0
	California, Oregon, & Washington	34	0	170	0
Sei whale	Eastern North Pacific	2	0	10	0
Minke whale	Alaska	0	0	0	0
	California, Oregon, & Washington	18	0	90	0
Gray whale	Eastern North Pacific	12*	0	60*	0
	Western North Pacific	0	0	0	0
Sperm whale	North Pacific	0	0	0	0
	California, Oregon, & Washington	78	0	390	0
Kogia (spp.)	California, Oregon, & Washington	106	1	530	5
Killer whale	Alaska Resident	2	0	10	0
	Northern Resident	0	0	0	0
	West Coast Transient	207	0	1,035	0
	East N. Pacific Offshore	22	0	110	0

	East N. Pacific Southern Resident	0	0	0	0
Short-finned pilot whale	California, Oregon, & Washington	0	0	0	0
Short-beaked common dolphin	California, Oregon, & Washington	1,628	0	8,140	0
Bottlenose dolphin	California, Oregon, & Washington	0	0	0	0
Striped dolphin	California, Oregon, & Washington	14	0	70	0
Pacific white-sided dolphin	North Pacific	3	0	15	0
	California, Oregon, & Washington	4,869	0	24,345	0
Northern right whale dolphin	California, Oregon, & Washington	2,038	0	10,190	0
Risso's dolphin	California, Oregon, & Washington	1,154	0	5,770	0
Harbor porpoise	Southeast Alaska	926	0	4,630	0
	Northern OR/WA Coast	17,212	15	86,060	75
	Northern CA/Southern OR	25,819	23	129,095	115
	WA Inland Waters	5,409*	6	27,045*	30
Dall's porpoise	Alaska	1,200	0	6,000	0
	California, Oregon, & Washington	10,157*	43	50,785*	215
Cuvier's beaked whale	Alaska	15	0	75	0
	California, Oregon, & Washington	91	0	455	0
Baird's beaked whale	Alaska	25	0	125	0
	California, Oregon, & Washington	149	0	745	0
Mesoplodon beaked whales	California, Oregon, & Washington	369	0	1,845	0
Steller sea lion	Eastern U.S.	521*	0	2,605*	0
Guadalupe fur seal	Mexico	3	0	15	0
California sea lion	U.S. Stock	2,146*	0	10,730*	0
Northern fur seal	Eastern Pacific	1,830	0	9,150	0
	California	27	0	135	0
Northern elephant seal	California Breeding	1,325	2	6625	10
Harbor seal	Southeast Alaska (Clarence Strait)	22	0	110	0
	OR/WA Coast	1,655	4	8,275	20
	California	0	0	0	0
	WA Northern Inland Waters	1,823*	22*	9,115**	110*
	Southern Puget Sound	196	1	980	5
	Hood Canal	59,217	67	296,085	335

*these numbers have been updated since the proposed rule to reflect Navy corrections to the number of hours and the location of sonar use attributed to life cycle pierside sonar testing events.

Vessel Strike

There has never been a recorded vessel strike to marine mammals during any testing activities in the Study Area. A detailed analysis of strike data is contained in Section 6.7 (Estimated Take of Large Whales by Navy Vessel Strike) of the LOA application. Testing activities involving vessel movement could mainly occur in the Inland Waters and in Western Behm Canal with some additional testing activities in the offshore region. The majority of vessels used in the Inland Waters and Western Behm

Canal are smaller vessels, which are less likely to be involved in a whale strike. The Navy's proposed actions would not result in any appreciable changes in locations or frequency of vessel activity, and there have been no whale strikes during any previous testing activities in the Study Area. The manner in which the Navy has tested would remain consistent with the range of variability observed over the last decade, so neither the Navy nor NMFS anticipates vessel strikes would occur within the Study Area during testing events. Further, takes by injury or mortality resulting from vessel strike were not predicted in the Navy's quantitative analysis. As such, NMFS is not authorizing take by injury or mortality resulting from vessel strike for this final rule. However, the Navy has proposed measures (see Mitigation) to mitigate potential impacts to marine mammals from vessel strikes during testing activities in the Study Area.

Marine Mammal Habitat

The Navy's proposed training and testing activities could potentially affect marine mammal habitat through the introduction of sound into the water column, impacts to the prey species of marine mammals, bottom disturbance, or changes in water quality. Each of these components was considered in Chapter 3 of the NWTT FEIS/OEIS. Based on the information in the Marine Mammal Habitat section of the proposed rule (80 FR 31737, June 3, 2015; pages 31769-31771) and the supporting information included in the NWTT FEIS/OEIS, NMFS has determined that training and testing activities would not have adverse or long-term impacts on marine mammal habitat. In summary, expected effects to marine mammal habitat will include transitory elevated levels of anthropogenic sound in the water column; short-term physical alteration of the water column or bottom topography; brief disturbances to marine invertebrates; localized and infrequent

disturbance to fish; a limited number of fish mortalities; and temporary marine mammal avoidance.

Analysis and Negligible Impact Determination

Negligible impact is "an impact resulting from the specified activity that cannot be reasonably expected to, and is not reasonably likely to, adversely affect the species or stock through effects on annual rates of recruitment or survival" (50 CFR 216.103). A negligible impact finding is based on the lack of likely adverse effects on annual rates of recruitment or survival (i.e., population-level effects). An estimate of the number of takes, alone, is not enough information on which to base an impact determination, as the severity of harassment may vary greatly depending on the context and duration of the behavioral response, many of which would not be expected to have deleterious impacts on the fitness of any individuals. In determining whether the expected takes will have a negligible impact, in addition to considering estimates of the number of marine mammals that might be "taken," NMFS must consider other factors, such as the likely nature of any responses (their intensity, duration, etc.), the context of any responses (critical reproductive time or location, migration, etc.), as well as the number and nature (e.g., severity) of estimated Level A harassment takes, the number of estimated mortalities, and the status of the species.

The Navy's specified activities have been described based on best estimates of the maximum amount of sonar and other acoustic source use or detonations that the Navy would conduct. There may be some flexibility in that the exact number of hours, items, or detonations may vary from year to year, but take totals are not authorized to exceed the

5-year totals indicated in Tables 14 - 18. We base our analysis and NID on the maximum number of takes authorized.

To avoid repetition, we provide some general analysis immediately below that applies to all the species listed in Tables 14 - 18, given that some of the anticipated effects (or lack thereof) of the Navy's training and testing activities on marine mammals are expected to be relatively similar in nature. However, below that, we break our analysis into species, or groups of species where relevant similarities exist, to provide more specific information related to the anticipated effects on individuals or where there is information about the status or structure of any species that would lead to a differing assessment of the effects on the population.

The Navy's take request is based on its model and post-model analysis. In the discussions below, the "acoustic analysis" refers to the Navy's modeling results and post-model analysis. The model calculates sound energy propagation from sonar, other active acoustic sources, and explosives during naval activities; the sound or impulse received by animat dosimeters representing marine mammals distributed in the area around the modeled activity; and whether the sound or impulse received by a marine mammal exceeds the thresholds for effects. The model estimates are then further analyzed to consider animal avoidance and implementation of highly effective mitigation measures to prevent Level A harassment, resulting in final estimates of effects due to Navy training and testing. NMFS provided input to the Navy on this process and the Navy's qualitative analysis is described in detail in Chapter 6 of its LOA application (*http://www.nmfs.noaa.gov/pr/permits/incidental/militry.htm*).

Generally speaking, and especially with other factors being equal, the Navy and NMFS anticipate more severe effects from takes resulting from exposure to higher received levels (though this is in no way a strictly linear relationship throughout species, individuals, or circumstances) and less severe effects from takes resulting from exposure to lower received levels. The requested number of Level B takes does not equate to the number of individual animals the Navy expects to harass (which is lower), but rather to the instances of take (i.e., exposures above the Level B harassment threshold) that would occur. Additionally, these instances may represent either a very brief exposure (seconds) or, in some cases, longer durations of exposure within a day. Depending on the location, duration, and frequency of activities, along with the distribution and movement of marine mammals, individual animals may be exposed to impulse or non-impulse sounds at or above the Level B harassment threshold on multiple days. However, the Navy is currently unable to estimate the number of individuals that may be taken during training and testing activities. The model results estimate the total number of takes that may occur to a smaller number of individuals. While the model shows that an increased number of exposures may take place due to an increase in events/activities and ordnance, the types and severity of individual responses to training and testing activities are not expected to change.

Behavioral Harassment

As discussed previously in this document, marine mammals can respond to LF/MFAS/HFAS in many different ways, a subset of which qualifies as behavioral harassment. As described in the proposed rule, the Navy uses the behavioral response function to quantify the number of behavioral responses that would qualify as Level B

behavioral harassment under the MMPA. As the statutory definition is currently applied, a wide range of behavioral reactions may qualify as Level B harassment under the MMPA, including but not limited to avoidance of the sound source, temporary changes in vocalizations or dive patterns, temporary avoidance of an area, or temporary disruption of feeding, migrating, or reproductive behaviors. The estimates calculated using the behavioral response function do not differentiate between the different types of potential reactions. Nor do the estimates provide information regarding the potential fitness or other biological consequences of the reactions on the affected individuals. We therefore consider the available scientific evidence to determine the likely nature of the modeled behavioral responses and the potential fitness consequences for affected individuals.

For LF/MFAS/HFAS, the Navy provided information (Table 19) estimating the percentage of the total number of takes by behavioral harassment that would occur within the 6-dB bins (without considering mitigation or avoidance). As mentioned above, an animal's exposure to a higher received level is more likely to result in a behavioral response that is more likely to adversely affect the health of the animal. As illustrated below, the majority (about 80 percent, at least for hull-mounted sonar, which is responsible for a large portion of the sonar takes) of calculated takes from MFAS result from exposures between 150 dB and 162 dB. Less than 0.5 percent of the takes are expected to result from exposures above 174 dB. Specifically, given a range of behavioral responses that may be classified as Level B harassment, to the degree that higher received levels are expected to result in more severe behavioral responses, only a small percentage of the anticipated Level B harassment from Navy activities might necessarily be expected to potentially result in more severe responses, especially when

the distance from the source at which the levels below are received is considered (see Table 19). Marine mammals are able to discern the distance of a given sound source, and given other equal factors (including received level), they have been reported to respond more to sounds that are closer (DeRuiter *et al*., 2013). Further, the estimated number of responses do not reflect either the duration or context of those anticipated responses, some of which will be of very short duration, and other factors should be considered when predicting how the estimated takes may affect individual fitness. A recent study by Moore and Barlow (2013) emphasizes the importance of context (e.g., behavioral state of the animals, distance from the sound source, etc.) in evaluating behavioral responses of marine mammals to acoustic sources.

Table 19. Non-impulsive ranges in 6-dB bins and percentage of behavioral harassments.

Received Level	**Sonar Bin MF1 (e.g., SQS-53; ASW Hull Mounted Sonar)**		**Sonar Bin MF4 (e.g., AQS-22; ASW Dipping Sonar)**		**Sonar Bin MF5 (e.g., SSQ-62; ASW Sonobuoy)**	
	Distance at Which Levels Occur Within Radius of Source (m)	**Percentage of Behavioral Harassments Occurring at Given Levels**	**Distance at Which Levels Occur Within Radius of Source (m)**	**Percentage of Behavioral Harassments Occurring at Given Levels**	**Distance at Which Levels Occur Within Radius of Source (m)**	**Percentage of Behavioral Harassments Occurring at Given Levels**
Low Frequency Cetaceans						
120 ≤SPL <126	178,750–156,450	0.00%	100,000–92,200	0.00%	22,800–15,650	0.00%
126 ≤SPL <132	156,450–147,500	0.00%	92,200–55,050	0.11%	15,650–11,850	0.05%
132 ≤SPL <138	147,500–103,700	0.21%	55,050–46,550	1.08%	11,850–6,950	2.84%
138 ≤SPL <144	103,700–97,950	0.33%	46,550–15,150	35.69%	6,950–3,600	16.04%
144 ≤SPL <150	97,950–55,050	13.73%	15,150–5,900	26.40%	3,600–1,700	33.63%
150 ≤SPL <156	55,050–49,900	5.28%	5,900–2,700	17.43%	1,700–250	44.12%
156 ≤SPL <162	49,900–10,700	72.62%	2,700–1,500	9.99%	250–100	2.56%
162 ≤SPL <168	10,700–4,200	6.13%	1,500–200	9.07%	100–<50	0.76%
168 ≤SPL <174	4,200–1,850	1.32%	200–100	0.18%	<50	0.00%
174 ≤SPL <180	1,850–850	0.30%	100–<50	0.05%	<50	0.00%
180 ≤SPL <186	850–400	0.07%	<50	0.00%	<50	0.00%

186 ≤SPL <192	400–200	0.01%	<50	0.00%	<50	0.00%
192 ≤ SPL <198	200–100	0.00%	<50	0.00%	<50	0.00%
Mid Frequency Cetaceans						
120 ≤ SPL <126	179,400–156,450	0.00%	100,000–92,200	0.00%	23,413–16,125	0.00%
126 ≤ SPL <132	156,450–147,500	0.00%	92,200–55,050	0.11%	16,125–11,500	0.06%
132 ≤ SPL <138	147,500–103,750	0.21%	55,050–46,550	1.08%	11,500–6,738	2.56%
138 ≤ SPL <144	103,750–97,950	0.33%	46,550–15,150	35.69%	6,738–3,825	13.35%
144 ≤ SPL <150	97,950–55,900	13.36%	15,150–5,900	26.40%	3,825–1,713	37.37%
150 ≤ SPL <156	55,900–49,900	6.12%	5,900–2,700	17.43%	1,713–250	42.85%
156 ≤ SPL <162	49,900–11,450	71.18%	2,700–1,500	9.99%	250–150	1.87%
162 ≤ SPL <168	11,450–4,350	7.01%	1,500–200	9.07%	150–<50	1.93%
168 ≤ SPL <174	4,350–1,850	1.42%	200–100	0.18%	<50	0.00%
174 ≤ SPL <180	1,850–850	0.29%	100–<50	0.05%	<50	0.00%
180 ≤ SPL <186	850–400	0.07%	<50	0.00%	<50	0.00%
186 ≤ SPL <192	400–200	0.01%	<50	0.00%	<50	0.00%
192 ≤ SPL <198	200–100	0.00%	<50	0.00%	<50	0.00%
Notes: (1) ASW = anti-submarine warfare, m = meters, SPL = sound pressure level; (2) Odontocete behavioral response function is also used for high-frequency cetaceans, phocid seals, otariid seals and sea lions, and sea otters.						

Although the Navy has been monitoring the effects of LF/MFAS/HFAS on marine mammals since 2006, and research on the effects of MFAS is advancing, our understanding of exactly how marine mammals in the Study Area will respond to LF/MFAS/HFAS is still improving. The Navy has submitted more than 80 reports, including Major Exercise Reports, Annual Exercise Reports, and Monitoring Reports, documenting hundreds of thousands of marine mammals across Navy range complexes, and there are only two instances of overt behavioral disturbances that have been observed. One cannot conclude from these results that marine mammals were not harassed from MFAS/HFAS, as a portion of animals within the area of concern were not

seen (especially those more cryptic, deep-diving species, such as beaked whales or *Kogia* spp.), the full series of behaviors that would more accurately show an important change is not typically seen (i.e., only the surface behaviors are observed), and some of the non-biologist watchstanders might not be well-qualified to characterize behaviors. However, one can say that the animals that were observed did not respond in any of the obviously more severe ways, such as panic, aggression, or anti-predator response.

Diel Cycle

As noted previously, many animals perform vital functions, such as feeding, resting, traveling, and socializing on a diel cycle (24-hour cycle). Behavioral reactions to noise exposure (when taking place in a biologically important context, such as disruption of critical life functions, displacement, or avoidance of important habitat) are more likely to be significant if they last more than one diel cycle or recur on subsequent days (Southall *et al*., 2007). Consequently, a behavioral response lasting less than one day and not recurring on subsequent days is not considered severe unless it could directly affect reproduction or survival (Southall *et al*., 2007). Note that there is a difference between multiple-day substantive behavioral reactions and multiple-day anthropogenic activities. For example, just because at-sea exercises last for multiple days does not necessarily mean that individual animals are either exposed to those exercises for multiple days or, further, exposed in a manner resulting in a sustained multiple day substantive behavioral response. Moreover, there are no MTE in the NWTT Study Area. Navy sonar exercises typically include assets that travel at high speeds (typically 10-15 knots, or higher) and likely cover large areas that are relatively far from shore, in addition to the fact that marine mammals are moving as well, which would make it unlikely that the same animal

could remain in the immediate vicinity of the ship for the entire duration of the exercise. Additionally, the Navy does not necessarily operate active sonar the entire time during an exercise. While it is certainly possible that these sorts of exercises could overlap with individual marine mammals multiple days in a row at levels above those anticipated to result in a take, because of the factors mentioned above, it is considered not to be likely for the majority of takes, does not mean that a behavioral response is necessarily sustained for multiple days, and still necessitates the consideration of likely duration and context to assess any effects on the individual's fitness.

Durations for non-impulsive activities utilizing tactical sonar sources vary and are fully described in Appendix A of the NWTT FEIS/OEIS. ASW training and testing exercises using MFAS/HFAS generally last for 2-16 hours, and may have intervals of non-activity in between. Because of the need to train in a large variety of situations, the Navy does not typically conduct successive ASW exercises in the same locations. Given the average length of ASW exercises (times of continuous sonar use) and typical vessel speed, combined with the fact that the majority of the cetaceans in the Study Area would not likely remain in an area for successive days, it is unlikely that an animal would be exposed to MFAS/HFAS at levels
likely to result in a substantive response that would then be carried on for more than one day or on successive days. Further, as stated above, there are no MTEs proposed in the NWTT Study Area.

Most planned explosive exercises are of a short duration (1-6 hours). Although explosive exercises may sometimes be conducted in the same general areas repeatedly, because of their short duration and the fact that they are in the open ocean and animals

can easily move away, it is similarly unlikely that animals would be exposed for long, continuous amounts of time. Furthermore, most explosive activities in NWTT are conducted at least 20 nm off shore and most over 50 nm offshore. Since densities for most marine mammals decrease further from the shelf break, and these activities are conducted in areas of generally lower marine mammal densities thus further reducing potential impacts.

TTS

As mentioned previously, TTS can last from a few minutes to days, be of varying degree, and occur across various frequency bandwidths, all of which determine the severity of the impacts on the affected individual, which can range from minor to more severe. The TTS sustained by an animal is primarily classified by three characteristics:

1. Frequency – Available data (of mid-frequency hearing specialists exposed to mid- or high-frequency sounds; Southall *et al*., 2007) suggest that most TTS occurs in the frequency range of the source up to one octave higher than the source (with the maximum TTS at ½ octave above). The more powerful MF sources used have center frequencies between 3.5 and 8 kHz and the other unidentified MF sources are, by definition, less than 10 kHz, which suggests that TTS induced by any of these MF sources would be in a frequency band somewhere between approximately 2 and 20 kHz. There are fewer hours of HF source use and the sounds would attenuate more quickly, plus they have lower source levels, but if an animal were to incur TTS from these sources, it would cover a higher frequency range (sources are between 20 and 100 kHz, which means that TTS could range up to 200 kHz; however, HF systems are typically used less frequently and for shorter time periods than surface ship and aircraft MF systems, so TTS from these

sources is even less likely). TTS from explosives would be broadband. Vocalization data for each species, which would inform how TTS might specifically interfere with communications with conspecifics, was provided in the LOA application.

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

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

Based on the range of degree and duration of TTS reportedly induced by exposures to non-pulse sounds of energy higher than that to which free-swimming marine mammals in the field are likely to be exposed during MFAS/HFAS training exercises in the Study Area, it is unlikely that marine mammals would ever sustain a TTS from

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

Acoustic Masking or Communication Impairment

Masking only occurs during the time of the signal (and potential secondary arrivals of indirect rays), versus TTS, which continues beyond the duration of the signal. Standard MFAS nominally pings every 50 seconds for hull-mounted sources. For the sources for which we know the pulse length, most are significantly shorter than hull-mounted active sonar, on the order of several microseconds to tens of microseconds. For hull-mounted active sonar, though some of the vocalizations that marine mammals make

are less than one second long, there is only a 1 in 50 chance that they would occur exactly when the ping was received, and when vocalizations are longer than one second, only parts of them are masked. Alternately, when the pulses are only several microseconds long, the majority of most animals' vocalizations would not be masked. Masking effects from MFAS/HFAS are expected to be minimal. If masking or communication impairment were to occur briefly, it would be in the frequency range of MFAS, which overlaps with some marine mammal vocalizations; however, it would likely not mask the entirety of any particular vocalization, communication series, or other critical auditory cue, because the signal length, frequency, and duty cycle of the MFAS/HFAS signal does not perfectly mimic the characteristics of any marine mammal's vocalizations. The other sources used in Navy training and testing, many of either higher frequencies (meaning that the sounds generated attenuate even closer to the source) or lower amounts of operation, are similarly not expected to result in masking.

PTS, Injury, or Mortality

NMFS believes that many marine mammals would deliberately avoid exposing themselves to the received levels of active sonar necessary to induce injury by moving away from or at least modifying their path to avoid a close approach. Additionally, in the unlikely event that an animal approaches the sonar vessel at a close distance, NMFS believes that the mitigation measures (i.e., shutdown/powerdown zones for MFAS/HFAS) would typically ensure that animals would not be exposed to injurious levels of sound. As discussed previously, the Navy utilizes both aerial (when available) and passive acoustic monitoring (during all ASW exercises) in addition to watchstanders on vessels to detect marine mammals for mitigation implementation.

If a marine mammal is able to approach a surface vessel within the distance necessary to incur PTS, the likely speed of the vessel (nominal 10-15 knots) would make it very difficult for the animal to remain in range long enough to accumulate enough energy to result in more than a mild case of PTS. As mentioned previously and in relation to TTS, the likely consequences to the health of an individual that incurs PTS can range from mild to more serious, depending upon the degree of PTS and the frequency band it is in, and many animals are able to compensate for the shift, although it may include energetic costs. Only 11 Level A PTS takes per year are predicted from NWTT training activities and 176 Level A (PTS) takes per year from testing activities.

As discussed previously, marine mammals (especially beaked whales) could potentially respond to MFAS at a received level lower than the injury threshold in a manner that indirectly results in the animals stranding. The exact mechanism of this potential response, behavioral or physiological, is not known. When naval exercises have been associated with strandings in the past, it has typically been when three or more vessels are operating simultaneously, in the presence of a strong surface duct, and in areas of constricted channels, semi-enclosed areas, and/or steep bathymetry. A combination of these environmental and operational parameters is not present in the NWTT action. Further, as stated earlier, there are no MTEs proposed in the Study Area. When this is combined with consideration of the number of hours of active sonar training that will be conducted and the nature of the exercises—which do not typically include the use of multiple hull-mounted sonar sources—we believe that the probability is small that this will occur. Furthermore, given that there has never been a stranding in the Study Area associated with sonar use and based on the number of occurrences where strandings

have been definitively associated with military sonar versus the number of hours of active sonar training that have been conducted, we believe that the probability is small that this will occur as a result of the Navy's proposed training and testing activities. Lastly, an active sonar shutdown protocol for strandings involving live animals milling in the water minimizes the chances that these types of events turn into mortalities.

As stated previously, there have been no recorded Navy vessel strikes of any marine mammals during training or testing in the NWTT Study Area to date, nor were takes by injury or mortality resulting from vessel strike predicted in the Navy's quantitative analysis.

Group and Species-Specific Analysis

Predicted harassment of marine mammals from sonar and other active acoustic sources and explosions during annual training and testing activities are shown in Tables 14 - 18. The vast majority of predicted exposures (greater than 99 percent) are expected to be Level B harassment (non-injurious TTS and behavioral reactions) from sonar and other active acoustic sources at relatively low received levels (less than 156 dB) (Table 19). As mentioned earlier in the Analysis and Negligible Impact Determination section, an animal's exposure to a higher received level is more likely to adversely affect the health of the animal. Only low numbers of harbor porpoise, Dall's porpoise, *Kogia* spp., Northern elephant seal, and harbor seal are expected to have injurious take(s), in the form of PTS, resulting from sonar and other active acoustic sources.

For explosive (impulsive) sources, the acoustic analysis predicts only ten annual exposures that would exceed thresholds associated with Level B (from training or testing activities) and only 2 annual exposures at levels that exceed the threshold for injury (only

from training activities). Only harbor porpoise, Dall's porpoise, Northern elephant seal, and harbor seals are predicted to have Level B (TTS) exposures resulting from explosives. The two Level A exposures would be of Dall's porpoise and would be in the form of PTS (Table 12). There are no mortality takes predicted for any marine mammal species for the NWTT activities.

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

Mysticetes – The Navy's acoustic analysis predicts that 185 instances of Level B harassment of mysticete whales may occur in the Study Area each year from sonar and other active acoustic stressors during training and testing activities. Species-specific Level B take estimates are as follows: 57 humpback whales (Central North Pacific and California/Oregon/Washington stocks); 11 blue whales (Eastern North Pacific stock); 61 fin whales (Northeast Pacific and California/Oregon/Washington stocks); 2 sei whales (Eastern North Pacific stock); 36 minke whales (Alaska and California/Oregon/Washington stocks); and 18 gray whales (Eastern North Pacific and Western North Pacific stocks). Based on the distribution information presented in the LOA application, it is highly unlikely that North Pacific right whales would be

encountered in the Study Area during events involving use of sonar and other active acoustic sources. The acoustic analysis did not predict any takes of North Pacific right whales, and NMFS is not authorizing any takes of this species. Of these species, humpback, blue, fin, and sei whales are currently listed as endangered under the ESA and depleted under the MMPA. ESA-listed humpback whales in the Study Area were proposed as a threatened Central America Distinct Population Segment and unlisted Distinct Population Segments on April 21, 2015 (80 FR 22304).

These exposure estimates represent a limited number of takes relative to population estimates for all mysticete stocks in the Study Area. When the numbers of behavioral takes are compared to the estimated stock abundance and if one assumes that each take happens to a separate animal, less than 20 percent of each of these stocks would be behaviorally harassed during the course of a year. Because the estimates given above represent the total number of exposures and not necessarily the number of individuals exposed, it is more likely that fewer individuals would be taken, but a subset would be taken more than one time per year. In the ocean, the use of sonar and other active acoustic sources is transient and is unlikely to repeatedly expose the same population of animals over a short period. Around heavily trafficked Navy ports and on fixed ranges, the possibility is greater for animals that are resident during all or part of the year to be exposed multiple times to sonar and other active acoustic sources. However, as discussed in the proposed rule, because neither the vessels nor the animals are stationary, significant long-term effects from repeated exposure are not expected.

Level B harassment takes are anticipated to be in the form of TTS and behavioral reactions and no injurious takes of humpback, blue, fin, minke, gray, or sei whales from

sonar and other active acoustic stressors or explosives are expected. The majority of acoustic effects to mysticetes from sonar and other active sound sources during training activities would be primarily from anti-submarine warfare events involving surface ships and hull mounted sonar. Research and observations show that if mysticetes are exposed to sonar or other active acoustic sources they may react in a number of ways depending on the characteristics of the sound source, their experience with the sound source, and whether they are migrating or on seasonal grounds (i.e., breeding or feeding). Reactions may include alerting, breaking off feeding dives and surfacing, diving or swimming away, or no response at all (Richardson, 1995; Nowacek, 2007; Southall *et al*., 2007; Finneran and Jenkins, 2012). Richardson *et al*. (1995) noted that avoidance (temporary displacement of an individual from an area) reactions are the most obvious manifestations of disturbance in marine mammals. Avoidance is qualitatively different from the startle or flight response, but also differs in the magnitude of the response (i.e., directed movement, rate of travel, etc.). Oftentimes avoidance is temporary, and animals return to the area once the noise has ceased. Additionally, migrating animals may ignore a sound source, or divert around the source if it is in their path.

Specific to U.S. Navy systems using low frequency sound, studies were undertaken in 1997–98 pursuant to the Navy's Low Frequency Sound Scientific Research Program. These studies found only short-term responses to low frequency sound by mysticetes (fin, blue, and humpback whales) including changes in vocal activity and avoidance of the source vessel (Clark, 2001; Miller *et al*., 2000; Croll *et al*., 2001; Fristrup *et al*., 2003; Nowacek *et al*., 2007). Baleen whales exposed to moderate low-frequency signals demonstrated no variation in foraging activity (Croll *et al*., 2001).

Low-frequency signals of the Acoustic Thermometry of Ocean Climate sound source were not found to affect dive times of humpback whales in Hawaiian waters (Frankel and Clark, 2000).

Specific to mid-frequency sound, studies by Melcón *et al*. (2012) in the Southern California Bight found that the likelihood of blue whale low-frequency calling (usually associated with feeding behavior) decreased with an increased level of MFAS, beginning at a SPL of approximately 110-120 dB re 1 μPa. However, it is not known whether the lower rates of calling actually indicated a reduction in feeding behavior or social contact since the study used data from remotely deployed, passive acoustic monitoring buoys. Preliminary results from the 2010–2011 field season of an ongoing behavioral response study in Southern California waters indicated that in some cases and at low received levels, tagged blue whales responded to MFAS but that those responses were mild and there was a quick return to their baseline activity (Southall *et al*., 2012b). Blue whales responded to a mid-frequency sound source, with a source level between 160 and 210 dB re 1 μPa at 1 m and a received sound level up to 160 dB re 1 μPa, by exhibiting generalized avoidance responses and changes to dive behavior during the exposure experiments (CEE) (Goldbogen *et al*., 2013). However, reactions were not consistent across individuals based on received sound levels alone, and likely were the result of a complex interaction between sound exposure factors such as proximity to sound source and sound type (MFAS simulation vs. pseudo-random noise), environmental conditions, and behavioral state. Surface feeding whales did not show a change in behavior during CEEs, but deep feeding and non-feeding whales showed temporary reactions that quickly abated after sound exposure. Distances of the sound source from the whales during CEEs

were sometimes less than a mile. Blue whales have been documented exhibiting a range of foraging strategies for maximizing feeding dependent on the density of their prey at a given location (Goldbogen *et al*., 2015), so it may be that a temporary behavioral reaction or avoidance of a location where feeding was occurring is not meaningful to the life history of an animal. The preliminary findings from Goldbogen *et al*. (2013) and Melcón *et al*. (2012) are generally consistent with the Navy's criteria and thresholds for predicting behavioral effects to mysticetes from sonar and other active acoustic sources used in the quantitative acoustic effects analysis for NWTT. The Navy's behavioral response function predicts the probability of a behavioral response that rises to a Level B take for individuals exposed to a received SPL of 120 dB re 1 μPa or greater, with an increasing probability of reaction with increased received level as demonstrated in Melcón *et al*. (2012).

High-frequency systems are notably outside of mysticetes' ideal hearing and vocalization range and it is unlikely that they would cause a significant behavioral reaction.

Most Level B harassments to mysticetes from sonar in the Study Area would result from received levels less than 156 dB SPL (Table 19). Therefore, the majority of Level B takes are expected to be in the form of milder responses (i.e., lower-level exposures that still rise to the level of take, but would likely be less severe in the range of responses that qualify as take) of a generally short duration. As mentioned earlier in the Analysis and Negligible Impact Determination section, we anticipate more severe effects from takes when animals are exposed to higher received levels. Most low-frequency (mysticetes) cetaceans observed in studies usually avoided sound sources at levels of less

than or equal to 160 dB re 1μPa. Occasional milder behavioral reactions are unlikely to cause long-term consequences for individual animals or populations. Even if sound exposure were to be concentrated in a relatively small geographic area over a long period of time (e.g., days or weeks during major training exercises), we would expect that some individual whales would avoid areas where exposures to acoustic stressors are at higher levels. For example, Goldbogen *et al*. (2013) indicated some horizontal displacement of deep foraging blue whales in response to simulated MFA sonar. Given these animal's mobility and large ranges, we would expect these individuals to temporarily select alternative foraging sites nearby until the exposure levels in their initially selected foraging area have decreased. Therefore, even temporary displacement from initially selected foraging habitat is not expected to impact the fitness of any individual animals because we would expect equivalent foraging to be available in close proximity. Because we do not expect any fitness consequences from any individual animals, we do not expect any population level effects from these behavioral responses.

As explained above, recovery from a threshold shift (TTS) can take a few minutes to a few days, depending on the exposure duration, sound exposure level, and the magnitude of the initial shift, with larger threshold shifts and longer exposure durations requiring longer recovery times (Finneran *et al*., 2005; Finneran and Schlundt, 2010; Mooney *et al*., 2009a; Mooney *et al*., 2009b). However, large threshold shifts are not anticipated for these activities because of the unlikelihood that animals will remain within the ensonified area (due to the short duration of the majority of exercises, the speed of the vessels, and the short distance within which the animal would need to approach the sound source) at high levels for the duration necessary to induce larger threshold shifts. Threshold shifts do not necessarily affect all hearing frequencies equally, so some threshold shifts may not interfere with an animal's hearing of biologically relevant sounds. Furthermore, the implementation of mitigation and the sightability of mysticetes (due to their large size) reduces the potential for a significant behavioral reaction or a threshold shift to occur.

There is no designated critical habitat for mysticetes in the NWTT Study Area. There are also no known specific breeding or calving areas for mysticete species within the Study Area. Some biologically-important seasonal feeding and migration areas for mysticetes (Northern Puget Sound Feeding Area for gray whales; Northwest Feeding Area for gray whales; Northbound Migration Phase A for gray whales; Northbound Migration Phase B for gray whales; Northern Washington Feeding Area for humpback whales; Stonewall and Heceta Bank Feeding Area for humpback whales; and Point St. George Feeding Area for humpback whales (Calambokidis *et al*., 2015) overlap slightly with portions of the Study Area (see Figures 3.4-3 – 3.4-5 of the NWTT FEIS/OEIS). However, the Navy and NMFS conducted an assessment of these known biologically important areas (compiled and designated as BIAs in Van Parijs *et al*., 2015) for humpback whales and gray whales against areas where most Navy acoustic activities (including those that involve ASW hull-mounted sonar, sonobuoys, and use of explosive munitions) have historically occurred or are proposed in the Study Area for 2015-2020 and identified that there is generally limited to no spatial overlap. Refer to the *Consideration of Time/Area Limitations* section within this final rule for a detailed assessment of the potential spatial and activity overlap with these gray and humpback whale feeding areas. NMFS and the Navy (see Chapter 3.4.3 of the NWTT FEIS/OEIS) have fully considered any potential impacts from Navy training and testing activities on a given BIA and have determined that the overall risk to species in these areas is extremely low or biologically insignificant, in part due to the generally infrequent, temporally and spatially variable, and extreme offshore nature of sonar-related activities and sound propagation relative to the more coastally distributed biologically important areas; the

probability that propagated receive levels within these areas would be relatively low in terms of behavioral criteria (Debich *et al*., 2014; U.S. Department of the Navy, 2013d); the likelihood of TTS or PTS sound levels being extremely low; and the overall application of Navy mitigation procedures for marine mammals sighted within prescribed mitigation zones if such activities were to occur near these areas. Thus, Navy training and testing activities using sonar and other active acoustic sources and explosives are unlikely to have an adverse effect on the ability of gray and humpback whales to engage in those activities for which the BIAs have been identified (feeding or migration).

The potential for the most overlap between Navy activities and the gray and humpback feeding areas will be in the following three feeding areas – the Humpback Whale Northern Washington feeding area, Stonewall Heceta Bank feeding area, and the Gray Whale Northern Puget Sound feeding area. As described in the Navy's and NMFS' analysis discussed in the *Consideration of Time/Area Limitations* section of this rule, though, very few takes are expected to result from activities within these feeding areas, and the nature of these activities along with the proposed mitigation measures would result in the least practicable adverse impacts on the species and their habitat. However, the Navy has agreed to monitor, and provide NMFS with reports of, hull-mounted mid-frequency and high frequency active sonar use during training and testing in the months specified in the following three feeding areas to the extent that active sonar training or testing does occur in these feeding areas: Humpback Whale Northern Washington feeding area (May through November); Stonewall and Heceta Bank feeding area (May through November) and Gray Whale Northern Puget Sound Feeding Area (March through May). The Navy will provide this information annually in the classified exercise

report to the extent sonar use in those areas can be distinguished from data retrieved in Navy's system. The intent would be to inform future adaptive management discussions about future mitigation adjustments should sonar use increase above the existing low use/low overlap description provided by the Navy or if new science provides a biological basis for increased protective measures. If additional biologically important areas are identified by NMFS after finalization of this rule and the Navy's NWTT EIS/OEIS, the Navy and NMFS will use the Adaptive Management process to assess whether any additional mitigation should be considered in those areas.

Finally, the Navy has previously affirmed that it is not conducting nor is it proposing to conduct training with mid-frequency active hull-mounted sonar on vessels while underway in Puget Sound and the Strait of Juan de Fuca. The Navy's process since 2003 requires approval prior to operating mid-frequency active hull-mounted sonar in Puget Sound and the Strait of Juan de Fuca. The Navy will continue the permission and approval process, in place since 2003, through U.S. Pacific Fleet's designated authority for all mid-frequency active hull-mounted sonar on vessels while training underway in Puget Sound and Strait of Juan de Fuca. Pierside maintenance/testing of sonar systems within Puget Sound and the Strait of Juan de Fuca will also require approval by U.S. Pacific Fleet's designated authority or Systems Command designated authority as applicable, and must be conducted in accordance with PMAP for ship and submarine active sonar use, to include the use of Lookouts. The use of active sonar for anti-terrorism/force protection or for safe navigation within the Puget Sound or Strait of Juan de Fuca is always permitted for safety of ship/national security reasons. These mitigation

measures are incorporated within this final rule and continue to minimize sonar use within these areas.

There has never been a recorded vessel strike of a mysticete whale during any active training or testing activities in the Study Area. A detailed analysis of strike data is contained in Chapter 6 (Section 6.7, Estimated Take of Large Whales by Navy Vessel Strike) of the LOA application. The Navy and NMFS do not anticipate vessel strikes to any marine mammals during training or testing activities within the Study Area, nor were takes by injury or mortality resulting from vessel strike predicted in the Navy's analysis. Therefore, NMFS is not authorizing mysticete takes (by injury or mortality) from vessel strikes during the 5-year period of the NWTT regulations.

Sperm Whales – The Navy's acoustic analysis predicts that 159 instances of Level B harassment of sperm whales (California/Oregon/Washington stock) may occur in the Study Area each year from sonar or other active acoustic stressors during training and testing activities. These Level B takes are anticipated to be in the form of TTS and behavioral reactions and no injurious takes of sperm whales from sonar and other active acoustic stressors or explosives are requested or proposed for authorization. Sperm whales have shown resilience to acoustic and human disturbance, although they may react to sound sources and activities within a few kilometers. Sperm whales that are exposed to activities that involve the use of sonar and other active acoustic sources may alert, ignore the stimulus, avoid the area by swimming away or diving, or display aggressive behavior (Richardson, 1995; Nowacek, 2007; Southall *et al*., 2007; Finneran and Jenkins, 2012). Some (but not all) sperm whale vocalizations might overlap with the MFAS/HFAS TTS frequency range, which could temporarily decrease an animal's

sensitivity to the calls of conspecifics or returning echolocation signals. However, as noted previously, NMFS does not anticipate TTS of a long duration or severe degree to occur as a result of exposure to MFAS/HFAS. Recovery from a threshold shift (TTS) can take a few minutes to a few days, depending on the exposure duration, sound exposure level, and the magnitude of the initial shift, with larger threshold shifts and longer exposure durations requiring longer recovery times (Finneran *et al*., 2005; Mooney *et al*., 2009a; Mooney *et al*., 2009b; Finneran and Schlundt, 2010). Large threshold shifts are not anticipated for these activities because of the unlikelihood that animals will remain within the ensonified area (due to the short duration of the majority of exercises, the speed of the vessels, and the short distance within which the animal would need to approach the sound source) at high levels for the duration necessary to induce larger threshold shifts. Threshold shifts do not necessarily affect all hearing frequencies equally, so some threshold shifts may not interfere with an animal's hearing of biologically relevant sounds. No sperm whales are predicted to be exposed to MFAS/HFAS sound levels associated with PTS or injury.

The majority of Level B takes are expected to be in the form of mild responses (low-level exposures) and of a generally short duration. Relative to the population size, this activity is anticipated to result only in a limited number of Level B harassment takes. When the number of behavioral takes is compared to the estimated stock abundance and if one assumes that each take happens to a separate animal, less than 8 percent of the California/Oregon/Washington stock would be behaviorally harassed during the course of a year. Because the estimates given above represent the total number of exposures and not necessarily the number of individuals exposed, it is more likely that fewer individuals

would be taken, but a subset would be taken more than one time per year. In the ocean, the use of sonar and other active acoustic sources is transient and is unlikely to repeatedly expose the same population of animals over a short period. Around heavily trafficked Navy ports and on fixed ranges, the possibility is greater for animals that are resident during all or part of the year to be exposed multiple times to sonar and other active acoustic sources. However, as discussed in the proposed rule, because neither the vessels nor the animals are stationary, significant long-term effects from repeated exposure are not expected. Overall, the number of predicted behavioral reactions are unlikely to cause long-term consequences for individual animals or populations. The NWTT activities are not expected to occur in an area/time of specific importance for reproductive, feeding, or other known critical behaviors for sperm whales. Consequently, the activities are not expected to adversely impact annual rates of recruitment or survival of sperm whales. Sperm whales are listed as depleted under the MMPA and endangered under the ESA; however, there is no designated critical habitat in the Study Area.

There has never been a recorded vessel strike of a sperm whale during any active training or testing activities in the Study Area. A detailed analysis of strike data is contained in Chapter 6 (Section 6.7, Estimated Take of Large Whales by Navy Vessel Strike) of the LOA application. The Navy and NMFS do not anticipate vessel strikes to any marine mammals during training or testing activities within the Study Area, nor were takes by injury or mortality resulting from vessel strikes predicted in the Navy's analysis. Therefore, NMFS is not authorizing sperm whale takes (by injury or mortality) from vessel strikes during the 5-year period of the NWTT regulations.

Porpoises - The Navy's acoustic analysis predicts that 15,087 instances of Level B harassment of Dall's porpoises (Alaska and California/Oregon/Washington stocks) and 138,298 instances of Level B harassment of harbor porpoises (Southeast Alaska, Northern Oregon/Washington Coast, Northern California/Southern Oregon, and Washington Inland Waters stocks) (mainly non-TTS behavioral harassment) may occur each year from sonar and other active acoustic stressors and explosives associated with training and testing activities in the Study Area. These estimates represent the total number of exposures and not necessarily the number of individuals exposed, as a single individual may be exposed multiple times over the course of a year. Behavioral responses can range from a mild orienting response, or a shifting of attention, to flight and panic (Richardson, 1995; Nowacek, 2007; Southall *et al*., 2007).

Acoustic analysis (factoring in the post-model correction for avoidance and mitigation) also predicted that 47 Dall's porpoises and 45 harbor porpoises might be exposed to sound levels likely to result in PTS or injury (Level A harassment) from mainly sonar and other active acoustic stressors; only 2 level A takes are predicted to Dall's porpoise from explosives. In the case of all explosive exercises, it is worth noting that the amount of explosive and acoustic energy entering the water, and therefore the effects on marine mammals, may be overestimated, as many explosions actually occur upon impact with above-water targets– nonetheless, here we analyze the effects of the takes authorized. However, sources such as these were modeled as exploding at 1-meter depth. Furthermore, in the case of all explosive exercises, the exclusion zones are considerably larger than the estimated distance at which an animal would be exposed to injurious sounds or pressure waves. Furthermore, in the case of all explosive exercises,

the exclusion zones are considerably larger than the estimated distance at which an animal would be exposed to injurious sounds or pressure waves. When the numbers of takes for Dall's porpoise are compared to the estimated stock abundances and if one assumes that each take happens to a separate animal, approximately 33 percent of the Alaska stock and less than 2 percent of the California/Oregon/Washington stock would be harassed (behaviorally) during the course of a year. Because the estimates given above represent the total number of exposures and not necessarily the number of individuals exposed, it is more likely that fewer individuals would be taken, but a subset would be taken more than one time per year.

The number of harbor porpoises—in particular, Northern Oregon/Washington Coast and Northern California/Southern Oregon stocks—behaviorally harassed by exposure to MFAS/HFAS in the Study Area is higher than the other species (and, in fact, suggests that every member of the stock could potentially be taken by Level B harassment multiple times, although it is more likely that fewer individuals are harassed but a subset are harassed more than one time during the course of the year). This is due to the low Level B harassment threshold (we assume for the purpose of estimating take that all harbor porpoises exposed to 120 dB or higher MFAS/HFAS will be taken by Level B behavioral harassment), which essentially makes the ensonified area of effects significantly larger than for the other species. However, the fact that the threshold is a step function and not a curve (and assuming uniform density) means that the vast majority of the takes occur in the very lowest levels that exceed the threshold (it is estimated that approximately 80 percent of the takes are from exposures to 120 dB-126 dB), which means that anticipated behavioral effects are not expected to be severe (e.g.,

temporary avoidance). As mentioned above, an animal's exposure to a higher received level is more likely to result in a behavioral response that is more likely to adversely affect the health of an animal.

Animals that do experience hearing loss (TTS or PTS) may have reduced ability to detect relevant sounds such as predators, prey, or social vocalizations. Some porpoise vocalizations might overlap with the MFAS/HFAS TTS frequency range (2–20 kHz). Recovery from a threshold shift (TTS; partial hearing loss) can take a few minutes to a few days, depending on the exposure duration, sound exposure level, and the magnitude of the initial shift, with larger threshold shifts and longer exposure durations requiring longer recovery times (Finneran *et al*., 2005; Mooney *et al*., 2009a; Mooney *et al*., 2009b; Finneran and Schlundt, 2010). More severe shifts may not fully recover and thus would be considered PTS. However, large degrees of PTS are not anticipated for these activities because of the unlikelihood that animals will remain within the ensonified area (due to the short duration of the majority of exercises, the speed of the vessels, and the short distance within which the animal would need to approach the sound source) at high levels for the duration necessary to induce larger threshold shifts. Threshold shifts do not necessarily affect all hearing frequencies equally, so some threshold shifts may not interfere with an animal hearing biologically relevant sounds. The likely consequences to the health of an individual that incurs PTS can range from mild to more serious, depending upon the degree of PTS and the frequency band it is in, and many animals are able to compensate for the shift, although it may include energetic costs. Furthermore, likely avoidance of intense activity and sound coupled with mitigation measures would further reduce the potential for severe PTS exposures to occur. If a marine mammal is

able to approach a surface vessel within the distance necessary to incur PTS, the likely speed of the vessel (nominal 10-15 knots) would make it very difficult for the animal to remain in range long enough to accumulate enough energy to result in more than a mild case of PTS.

Harbor porpoises have been observed to be especially sensitive to human activity (Tyack *et al*., 2011; Pirotta *et al*., 2012). The information currently available regarding harbor porpoises suggests a very low threshold level of response for both captive (Kastelein *et al*., 2000; Kastelein *et al*., 2005) and wild (Johnston, 2002) animals. Southall *et al*. (2007) concluded that harbor porpoises are likely sensitive to a wide range of anthropogenic sounds at low received levels (~ 90 to 120 dB). Research and observations of harbor porpoises for other locations show that this small species is wary of human activity and will display profound avoidance behavior for anthropogenic sound sources in many situations at levels down to 120 dB re 1 µPa (Southall, 2007). Harbor porpoises routinely avoid and swim away from large motorized vessels (Barlow *et al*., 1988; Evans *et al*., 1994; Palka and Hammond, 2001; Polacheck and Thorpe, 1990). The vaquita, which is closely related to the harbor porpoise in the Study Area, appears to avoid large vessels at about 2,995 ft. (913 m) (Jaramillo-Legorreta *et al*., 1999). The assumption is that the harbor porpoise would respond similarly to large Navy vessels, possibly prior to commencement of sonar or explosive activity (i.e., pre-activity avoidance). Harbor porpoises may startle and temporarily leave the immediate area of the training or testing until after the event ends. Since a large proportion of training and testing activities occur within harbor porpoise habitat in the Study Area and given their very low behavioral threshold, predicted effects are more likely than with most other

odontocetes, especially at closer ranges (within a few kilometers). Since this species is typically found in nearshore and inshore habitats, resident animals that are present throughout the Study Area could receive multiple exposures over a short period of time year round. As mentioned earlier in the Analysis and Negligible Impact Determination section, we anticipate more severe effects from takes when animals are exposed to higher received levels. Animals that do not exhibit a significant behavioral reaction would likely recover from any incurred costs, which reduces the likelihood of long-term consequences, such as reduced fitness, for the individual or population.

ASW training and testing exercises using MFAS/HFAS generally last for 2-16 hours, and may have intervals of non-activity in between. In addition, the Navy does not typically conduct ASW exercises in the same locations. Given the average length of ASW exercises (times of continuous sonar use) and typical vessel speed, combined with the fact that the majority of the harbor porpoises in the Study Area would not likely remain in an area for successive days, it is unlikely that an animal would be exposed to MFAS/HFAS at levels likely to result in a substantive response (e.g., interruption of feeding) that would then be carried on for more than one day or on successive days. Thompson *et al*. (2013) showed that seismic surveys conducted over a 10-day period in the North Sea did not result in the broad-scale displacement of harbor porpoises away from preferred habitat. The harbor porpoises were observed to leave the area at the onset of survey, but returned within a few hours, and the overall response of the porpoises decreased over the 10-day period.

The harbor porpoise is a common species in the nearshore coastal waters of the Study Area year-round (Barlow, 1988; Green *et al*., 1992; Osmek *et al*., 1996, 1998;

Forney and Barlow, 1998; Carretta *et al*., 2009). Since 1999, Puget Sound Ambient Monitoring Program data and stranding data documented increasing numbers of harbor porpoise in Puget Sound, indicating that the species may be returning to the area (Nysewander, 2008; Washington Department of Fish and Wildlife, 2008; Jeffries, 2013a). Sightings in northern Hood Canal (north of the Hood Canal Bridge) have increased in recent years (Calambokidis, 2010). Harbor porpoise continue to inhabit the waters of Hood Canal (including Dabob Bay), which has for decades served as the location for training and testing events using sonar and other active acoustic sources.

Considering the information above, the predicted effects to Dall's and harbor porpoises are unlikely to cause long-term consequences for individual animals or the population. The NWTT activities are not expected to occur in an area/time of specific importance for reproductive, feeding, or other known critical behaviors for Dall's and harbor porpoises. Pacific stocks of Dall's and harbor porpoises are not listed as depleted under the MMPA. Consequently, the activities are not expected to adversely impact annual rates of recruitment or survival of porpoises.

Pygmy and Dwarf Sperm Whales (Kogia spp.) - Due to the difficulty in differentiating

these two species at sea, an estimate of the effects on the two species have been combined. The Navy's acoustic analysis predicts that 179 instances of Level B harassment (TTS and behavioral reaction) of the California/Oregon/Washington stock of *Kogia* spp. may occur each year from sonar and other active acoustic stressors associated with training and testing activities in the Study Area. The Navy's acoustics analysis (factoring in the post-model correction for avoidance and mitigation) also indicates that 1

exposure of *Kogia* to sound levels from non-impulsive acoustic sources likely to result in level A harassment (PTS) may occur during testing activities in the Study Area. Relative to population size these likely represent only a limited number of takes if one assumes that each take happens to a separate animal. Because the estimates given above represent the total number of exposures and not necessarily the number of individuals exposed, it is more likely that fewer individuals would be taken, but a subset would be taken more than one time per year.

Recovery from a threshold shift (TTS; partial hearing loss) can take a few minutes to a few days, depending on the exposure duration, sound exposure level, and the magnitude of the initial shift, with larger threshold shifts and longer exposure durations requiring longer recovery times (Finneran *et al*., 2005; Mooney *et al*., 2009a; Mooney *et al*., 2009b; Finneran and Schlundt, 2010). An animal incurring PTS would not fully recover. However, large degrees of threshold shifts (PTS or TTS) are not anticipated for these activities because of the unlikelihood that animals will remain within the ensonified area (due to the short duration of the majority of exercises, the speed of the vessels, and the short distance within which the animal would need to approach the sound source) at high levels for the duration necessary to induce larger threshold shifts. Threshold shifts do not necessarily affect all hearing frequencies equally, so some threshold shifts may not interfere with an animal hearing biologically relevant sounds. The likely consequences to the health of an individual that incurs PTS can range from mild to more serious, depending upon the degree of PTS and the frequency band it is in, and many animals are able to compensate for the shift, although it may include energetic costs. Furthermore, likely avoidance of intense activity and sound coupled with mitigation measures would

further reduce the potential for more-severe PTS exposures to occur. If a pygmy or dwarf sperm whale is able to approach a surface vessel within the distance necessary to incur PTS, the likely speed of the vessel (nominal 10-15 knots) would make it very difficult for the animal to remain in range long enough to accumulate enough energy to result in more than a mild case of PTS.

Some *Kogia* spp. vocalizations might overlap with the MFAS/HFAS TTS frequency range (2–20 kHz), but the limited information for *Kogia* spp. indicates that their clicks are at a much higher frequency and that their maximum hearing sensitivity is between 90 and 150 kHz.

Research and observations on *Kogia* spp. are limited. These species tend to avoid human activity and presumably anthropogenic sounds. Pygmy and dwarf sperm whales may startle and leave the immediate area of activity, reducing potential impacts. Pygmy and dwarf sperm whales have been observed to react negatively to survey vessels or low altitude aircraft by quick diving and other avoidance maneuvers, and none were observed to approach vessels (Wursig *et al*., 1998). Based on their tendency to avoid acoustic stressors (e.g., quick diving and other vertical avoidance maneuvers) coupled with the short duration and intermittent nature (e.g., sonar pings during ASW activities occur about every 50 seconds) of the majority of training and testing exercises and the speed of the Navy vessels involved, it is unlikely that animals would receive multiple exposures over a short period of time, allowing animals to recover lost resources (*e.g*., food) or opportunities (*e.g*., mating).

The predicted effects to *Kogia* spp. are predominantly temporary, and effects are unlikely to cause long-term consequences for individual animals or populations. The

NWTT activities are not expected to occur in an area/time of specific importance for reproductive, feeding, or other known critical behaviors. Pacific stocks of *Kogia* are not depleted under the MMPA. Consequently, the activities are not expected to adversely impact annual rates of recruitment or survival of pygmy and dwarf sperm whales.

Beaked Whales – The Navy's acoustic analysis predicts that the following numbers of Level B harassment of beaked whales may occur annually from sonar and other active acoustic stressors associated with training and testing activities in the Study Area: 765 Baird's beaked whales (California/Oregon/Washington and Alaska stocks), 459 Cuvier's beaked whales (California/Oregon/Washington and Alaska stocks), and 1,786 *Mesoplodon* beaked whales (California/Oregon/Washington stock). These estimates represent the total number of exposures and not necessarily the number of individuals exposed, as a single individual may be exposed multiple times over the course of a year. These takes are anticipated to be in the form of behavioral harassment (TTS and behavioral reaction) and no injurious takes of beaked whales from active acoustic stressors or explosives are requested or proposed. When the numbers of behavioral takes are compared to the estimated stock abundances and if one assumes that each take happens to a separate animal, less than 6 percent of the California/Oregon/Washington stock of Cuvier's beaked whale would be behaviorally harassed during the course of a year (stock abundance for the Alaska stock is unknown). Because the estimates given above represent the total number of exposures and not necessarily the number of individuals exposed, it is more likely that fewer individuals would be taken, but a subset would be taken more than one time per year.

Virtually all of the Baird's and *Mesoplodon* beaked whale stocks (California/Oregon/Washington) would potentially be behaviorally harassed each year, although it is more likely that fewer individuals would be harassed but a subset would be harassed more than one time during the course of the year. As is the case with harbor porpoises, beaked whales have been shown to be particularly sensitive to sound and therefore have been assigned a lower harassment threshold based on observations of wild animals by McCarthy *et al*. (2011) and Tyack *et al*. (2011). The fact that the Level B harassment threshold is a step function (The Navy has adopted an unweighted 140 dB re 1 µPa SPL threshold for significant behavioral effects for all beaked whales) and not a curve (and assuming uniform density) means that the vast majority of the takes occur in the very lowest levels that exceed the threshold (it is estimated that approximately 80 percent of the takes are from exposures to 140 dB to 146 dB), which means that the anticipated effects for the majority of exposures are not expected to be severe (As mentioned above, an animal's exposure to a higher received level is more likely to result in a behavioral response that is more likely to adversely affect the health of an animal). Further, Moretti *et al*. (2014) recently derived an empirical risk function for Blainville's beaked whale that predicts there is a 0.5 probability of disturbance at a received level of 150 dB (CI: 144–155), suggesting that in some cases the current Navy step function may over-estimate the effects of an activity using sonar on beaked whales. Irrespective of the Moretti *et al*. (2014) risk function, NMFS' analysis assumes that all of the beaked whale Level B takes that are proposed for authorization will occur, and we base our negligible impact determination, in part, on the fact that these exposures would mainly occur at the

very lowest end of the 140-dB behavioral harassment threshold where behavioral effects are expected to be much less severe and generally temporary in nature.

Behavioral responses can range from a mild orienting response, or a shifting of attention, to flight and panic (Richardson, 1995; Nowacek, 2007; Southall *et al*., 2007; Finneran and Jenkins, 2012). Research has also shown that beaked whales are especially sensitive to the presence of human activity (Tyack *et al*., 2011; Pirotta *et al*., 2012). Beaked whales have been documented to exhibit avoidance of human activity or respond to vessel presence (Pirotta *et al*., 2012). Beaked whales were observed to react negatively to survey vessels or low altitude aircraft by quick diving and other avoidance maneuvers, and none were observed to approach vessels (Wursig *et al*., 1998). Some beaked whale vocalizations may overlap with the MFAS/HFAS TTS frequency range (2–20 kHz); however, as noted above, NMFS does not anticipate TTS of a serious degree or extended duration to occur as a result of exposure to MFA/HFAS. Recovery from a threshold shift (TTS) can take a few minutes to a few days, depending on the exposure duration, sound exposure level, and the magnitude of the initial shift, with larger threshold shifts and longer exposure durations requiring longer recovery times (Finneran *et al*., 2005; Mooney *et al*., 2009a; Mooney *et al*., 2009b; Finneran and Schlundt, 2010). Large threshold shifts are not anticipated for these activities because of the unlikelihood that animals will remain within the ensonified area (due to the short duration of the majority of exercises, the speed of the vessels, and the short distance within which the animal would need to approach the sound source) at high levels for the duration necessary to induce larger threshold shifts. Threshold shifts do not necessarily affect all

hearing frequencies equally, so some threshold shifts may not interfere with an animal's hearing of biologically relevant sounds.

It has been speculated for some time that beaked whales might have unusual sensitivities to sonar sound due to their likelihood of stranding in conjunction with MFAS use. Research and observations show that if beaked whales are exposed to sonar or other active acoustic sources they may startle, break off feeding dives, and avoid the area of the sound source to levels of 157 dB re 1 µPa, or below (McCarthy *et al*., 2011). Acoustic monitoring during actual sonar exercises revealed some beaked whales continuing to forage at levels up to 157 dB re 1 µPa (Tyack *et al*. 2011). Stimpert *et al*. (2014) tagged a Baird's beaked whale, which was subsequently exposed to simulated MFAS. Changes in the animal's dive behavior and locomotion were observed when received level reached 127 dB re 1µPa. However, Manzano-Roth *et al*. (2013) found that for beaked whale dives that continued to occur during MFAS activity, differences from normal dive profiles and click rates were not detected with estimated received levels up to 137 dB re 1 µPa while the animals were at depth during their dives. And in research done at the Navy's fixed tracking range in the Bahamas, animals were observed to leave the immediate area of the anti-submarine warfare training exercise (avoiding the sonar acoustic footprint at a distance where the received level was "around 140 dB" SPL, according to Tyack *et al*. [2011]) but return within a few days after the event ended (Claridge and Durban, 2009; Moretti *et al*., 2009, 2010; Tyack *et al*., 2010, 2011; McCarthy *et al*., 2011). Tyack *et al*. (2011) report that, in reaction to sonar playbacks, most beaked whales stopped echolocating, made long slow ascent to the surface, and moved away from the sound. A similar behavioral response study conducted in Southern California waters during the

2010-2011 field season found that Cuvier's beaked whales exposed to MFAS displayed behavior ranging from initial orientation changes to avoidance responses characterized by energetic fluking and swimming away from the source (DeRuiter *et al*., 2013b). However, the authors did not detect similar responses to incidental exposure to distant naval sonar exercises at comparable received levels, indicating that context of the exposures (e.g., source proximity, controlled source ramp-up) may have been a significant factor. The study itself found the results inconclusive and meriting further investigation. Cuvier's beaked whale responses suggested particular sensitivity to sound exposure as consistent with results for Blainville's beaked whale.

Populations of beaked whales and other odontocetes on the Bahamas and other Navy fixed ranges that have been operating for decades, appear to be stable. Behavioral reactions (avoidance of the area of Navy activity) seem likely in most cases if beaked whales are exposed to anti-submarine sonar within a few tens of kilometers, especially for prolonged periods (a few hours or more) since this is one of the most sensitive marine mammal groups to anthropogenic sound of any species or group studied to date and research indicates beaked whales will leave an area where anthropogenic sound is present (Tyack *et al*., 2011; De Ruiter *et al*., 2013; Manzano-Roth *et al*., 2013; Moretti *et al*., 2014). Research involving tagged Cuvier's beaked whales in the SOCAL Range Complex reported on by Falcone and Schorr (2012, 2014) indicates year-round prolonged use of the Navy's training and testing area by these beaked whales and has documented movements in excess of hundreds of kilometers by some of those animals. Given that some of these animals may routinely move hundreds of kilometers as part of their normal pattern, leaving an area where sonar or other anthropogenic sound is present may have

little, if any, cost to such an animal. Photo identification studies in the SOCAL Range Complex, a Navy range that is utilized for training and testing more frequently than the NWTT Study Area, have identified approximately 100 individual Cuvier's beaked whale individuals with 40 percent having been seen in one or more prior years, with re-sightings up to 7 years apart (Falcone and Schorr, 2014). These results indicate long-term residency by individuals in an intensively used Navy training and testing area, which may also suggest a lack of long-term consequences as a result of exposure to Navy training and testing activities. Finally, results from passive acoustic monitoring estimated regional Cuvier's beaked whale densities were higher than indicated by the NMFS's broad scale visual surveys for the U.S. west coast (Hildebrand and McDonald, 2009).

Based on the findings above, it is clear that the Navy's long-term ongoing use of sonar and other active acoustic sources has not precluded beaked whales from also continuing to inhabit those areas. In summary, based on the best available science, the Navy and NMFS believe that beaked whales that exhibit a significant TTS or behavioral reaction due to sonar and other active acoustic testing activities would generally not have long-term consequences for individuals or populations. Claridge (2013) speculated that sonar use in a Bahamas range could have "a possible population-level effect" on beaked whales based on lower abundance in comparison to control sites. In summary, Claridge suggested that lower reproductive rates observed at the Navy's Atlantic Undersea Test and Evaluation Center (AUTEC), when compared to a control site, were due to stressors associated with frequent and repeated use of Navy sonar. It is also important to note that there were some relevant shortcomings of this study. For example, all of the re-sighted whales during the 5-year study at both sites were female, which Claridge acknowledged

can lead to a negative bias in the abundance estimation. There was also a reduced effort and shorter overall study period at the AUTEC site that failed to capture some of the emigration/immigration trends identified at the control site. Furthermore, Claridge assumed that the two sites were identical and therefore should have equal potential abundances; when in reality, there were notable physical differences. The author also acknowledged that "information currently available cannot provide a quantitative answer to whether frequent sonar use at [the Bahamas range] is causing stress to resident beaked whales," and cautioned that the outcome of ongoing studies "is a critical component to understanding if there are population-level effects." Moore and Barlow (2013) have noted a decline in beaked whale populations in a broad area of the Pacific Ocean area out to 300 nm from the coast and extending from the Canadian-U.S. border to the tip of Baja Mexico. There are scientific caveats and limitations to the data used for that analysis, as well as oceanographic and species assemblage changes on the U.S. Pacific coast not thoroughly addressed. Although Moore and Barlow (2013) have noted a decline in the overall beaked whale population along the Pacific coast, in the small fraction of that area where the Navy has been training and testing with sonar and other systems for decades (the Navy's SOCAL Range Complex), higher densities and long-term residency by individual Cuvier's beaked whales suggest that the decline noted elsewhere is not apparent where Navy sonar use is most intense. Navy sonar training and testing is not conducted along a large part of the U.S. west coast from which Moore and Barlow (2013) drew their survey data. In Southern California, based on a series of surveys from 2006 to 2008 and a high number encounter rate, Falcone *et al*. (2009) suggested the ocean basin west of San Clemente Island may be an important region for Cuvier's beaked whales

given the number of animals encountered there. Follow-up research (Falcone and Schorr, 2012, 2014) in this same location suggests that Cuvier's beaked whales may have population sub-units with higher than expected residency, particularly in the Navy's instrumented Southern California Anti-Submarine Warfare Range. Encounters with multiple groups of Cuvier's and Baird's beaked whales indicated not only that they were prevalent on the range where Navy routinely trains and tests, but also that they were potentially present in much higher densities than had been reported for anywhere along the U.S. west coast (Falcone *et al*., 2009, Falcone and Schorr, 2012). This finding is also consistent with concurrent results from passive acoustic monitoring that estimated regional Cuvier's beaked whale densities were higher where Navy trains in the SOCAL training and testing area than indicated by NMFS's broad scale visual surveys for the U.S. west coast (Hildebrand and McDonald, 2009).

NMFS also considered New *et al*. (2013) and their mathematical model simulating a functional link between foraging energetics and requirements for survival and reproduction for 21 species of beaked whales. However, NMFS concluded that New *et al*. (2013) model lacks critical data and accurate inputs necessary to form valid conclusions specifically about impacts of anthropogenic sound from Navy activities on beaked whale populations. The study itself notes the need for "future research," identifies "key data needs" relating to input parameters that "particularly affected" the model results, and states only that the use of the model "in combination with more detailed research" *could* help predict the effects of management actions on beaked whale species. In short, information is not currently available to specifically support the use of

this model in a project-specific evaluation of the effects of navy activities on the impacted beaked whale species in NWTT.

No beaked whales are predicted in the acoustic analysis to be exposed to sound levels associated with PTS, other injury, or mortality. After decades of the Navy conducting similar activities in the NWTT Study Area without incident, NMFS does not expect strandings, injury, or mortality of beaked whales to occur as a result of training and testing activities. Stranding events coincident with Navy MFAS use in which exposure to sonar is believed to have been a contributing factor were detailed in the Stranding and Mortality section of the proposed rule. However, for some of these stranding events, a causal relationship between sonar exposure and the stranding could not be clearly established (Cox *et al*., 2006). In other instances, sonar was considered only one of several factors that, in their aggregate, may have contributed to the stranding event (Freitas, 2004; Cox *et al*., 2006). Because of the association between tactical MFAS use and a small number of marine mammal strandings, the Navy and NMFS have been considering and addressing the potential for strandings in association with Navy activities for years. In addition to a suite of mitigation measures intended to more broadly minimize impacts to marine mammals, the reporting requirements set forth in this rule ensure that NMFS is notified immediately (or as soon as clearance procedures allow) if a stranded marine mammal is found during or shortly after, and in the vicinity of, any Navy training exercise utilizing MFAS, HFAS, or underwater explosive detonations (see General Notification of Injured or Dead Marine Mammals in the regulatory text below). Additionally, through the MMPA process (which allows for adaptive management), NMFS and the Navy will determine the appropriate way to

proceed in the event that a causal relationship were to be found between Navy activities and a future stranding.

The NWTT training and testing activities are not expected to occur in an area/time of specific importance for reproductive, feeding, or other known critical behaviors for beaked whales. None of the Pacific stocks for beaked whales species found in the Study Area are depleted under the MMPA. The degree of predicted Level B harassment is expected to be mild, and no beaked whales are predicted in the acoustic analysis to be exposed to sound levels associated with PTS, other injury, or mortality. Consequently, the activities are not expected to adversely impact annual rates of recruitment or survival of beaked whales.

Dolphins and Small Whales – The Navy's acoustic analysis predicts the following numbers of Level B harassment of the associated species of delphinids (dolphins and small whales, excluding killer whales) may occur each year from sonar and other active acoustic sources during training and testing activities in the Study Area: 2,362 short-beaked common dolphins (California/Oregon/Washington stock); 36 striped dolphins (California/Oregon/Washington stock); 8,354 Pacific white-sided dolphins (California/Oregon/Washington and North Pacific stocks); 3,370 Northern right whale dolphins (California/Oregon/Washington stock); and 1,811 Risso's dolphins (California/Oregon/Washington stock). Based on the distribution information presented in the LOA application, it is highly unlikely that short-finned pilot whales or common bottlenose dolphins would be encountered in the Study Area. The acoustic analysis did not predict any takes of short-finned pilot whales or bottlenose dolphins and NMFS is not authorizing any takes of these species. Relative to delphinid population sizes, these

activities are anticipated to generally result only in a limited number of level B harassment takes. When the numbers of behavioral takes are compared to the estimated stock abundance and if one assumes that each take happens to a separate animal, less than 30 percent of the California/Oregon/Washington stock of Risso's dolphin; less than 30 percent of the California/Oregon/Washington stock and less than 0.02 percent of the North Pacific stock of pacific white-sided dolphin; less than 28 percent of the California/Oregon/Washington stock of northern right whale dolphin; less than 0.6 percent of the California/Oregon/Washington stock of short-beaked common dolphin; and less than 0.4 percent of the California/Oregon/Washington stock of striped dolphin would be behaviorally harassed during the course of a year. More likely, slightly fewer individuals are harassed, but a subset are harassed more than one time during the course of the year. Because the estimates given above represent the total number of exposures and not necessarily the number of individuals exposed, it is more likely that fewer individuals would be taken, but a subset would be taken more than one time per year

All of these takes are anticipated to be in the form of behavioral harassment (TTS and behavioral reaction) and no injurious takes of delphinids from sonar and other active acoustic stressors or explosives are requested or proposed for authorization. Further, the majority of takes are anticipated to be by behavioral harassment in the form of mild responses (low received levels and of a short duration). Behavioral responses can range from alerting, to changing their behavior or vocalizations, to avoiding the sound source by swimming away or diving (Richardson, 1995; Nowacek, 2007; Southall *et al*., 2007; Finneran and Jenkins, 2012). Delphinid species generally travel in large pods and should be visible from a distance in order to implement mitigation measures and reduce potential

impacts. Many of the recorded delphinid vocalizations overlap with the MFAS/HFAS TTS frequency range (2–20 kHz); however, as noted above, NMFS does not anticipate TTS of a serious degree or extended duration to occur as a result of exposure to MFAS/HFAS. Recovery from a threshold shift (TTS) can take a few minutes to a few days, depending on the exposure duration, sound exposure level, and the magnitude of the initial shift, with larger threshold shifts and longer exposure durations requiring longer recovery times (Finneran *et al*., 2005; Mooney *et al*., 2009a; Mooney *et al*., 2009b; Finneran and Schlundt, 2010). Large threshold shifts are not anticipated for these activities because of the unlikelihood that animals will remain within the ensonified area (due to the short duration of the majority of exercises, the speed of the vessels, and the short distance within which the animal would need to approach the sound source) at high levels for the duration necessary to induce larger threshold shifts. Threshold shifts do not necessarily affect all hearing frequencies equally, so some threshold shifts may not interfere with an animal's hearing of biologically relevant sounds.

The predicted effects to delphinids are unlikely to cause long-term consequences for individual animals or populations. The NWTT activities are not expected to occur in an area/time of specific importance for reproductive, feeding, or other known critical behaviors for delphinids. Pacific stocks of delphinid species found in the Study Area are not depleted under the MMPA. Consequently, the activities are not expected to adversely impact annual rates of recruitment or survival of delphinid species.

Killer Whales – The Navy's acoustic analysis predicts 255 instances of Level B harassment of killer whales (Alaska Resident, Northern Resident, West Coast Transient, Eastern North Pacific Offshore, and Eastern North Pacific Southern Resident stocks),

including 2 Level B behavioral takes of southern resident killer whales (but no more than 6 over five years), from sonar and other active acoustic sources during annual training activities in the Study Area. Relative to population sizes, these activities are anticipated to generally result only in a limited number of level B harassment takes. When the numbers of behavioral takes are compared to the estimated stock abundance and if one assumes that each take happens to a separate animal, less than 10 percent of all killer whale stocks in the Study Area—and 2 percent of the Southern Resident stock of killer whale—would be behaviorally harassed during the course of a year. More likely, slightly fewer individuals would be harassed, but a subset would be harassed more than one time during the course of the year.

All of these takes are anticipated to be in the form of behavioral harassment (TTS and behavioral reaction) and no injurious takes of killer whales from sonar and other active acoustic stressors or explosives are requested or proposed for authorization. Further, the majority of takes are anticipated to be by behavioral harassment in the form of mild responses. The killer whale's size and detectability makes it unlikely that these animals would be exposed to the higher energy or pressure expected to result in more severe effects. Killer whales generally travel in pods and should be visible from a distance in order to implement mitigation measures and reduce potential impacts.

Research and observations show that if killer whales are exposed to sonar or other active acoustic sources they may react in a number of ways depending on their experience with the sound source and what activity they are engaged in at the time of the acoustic exposure. Killer whales may not react at all until the sound source is approaching within a few hundred meters to within a few kilometers depending on the

environmental conditions and species. Killer whales that are exposed to activities that involve the use of sonar and other active acoustic sources may alert, ignore the stimulus, change their behaviors or vocalizations, avoid the sound source by swimming away or diving, or be attracted to the sound source. Research has demonstrated that killer whales may routinely move over long large distances (Andrews and Matkin, 2014; Fearnbach *et al*., 2013). In a similar documented long-distance movement, an Eastern North Pacific Offshore stock killer whale tagged off San Clemente Island, California, moved (over a period of 147 days) to waters off northern Mexico, then north to Cook Inlet, Alaska, and finally (when the tag ceased transmitting) to coastal waters off Southeast Alaska (Falcone and Schorr, 2014). Given these findings, temporary displacement due to avoidance of training and testing activities are therefore unlikely to have biological significance to individual animals. Long-term consequences to individual killer whales or populations are not likely due to exposure to sonar or other active acoustic sources.

The vocalizations of killer whales fall directly into the frequency range in which TTS would be incurred from the MFAS sources used during ASW exercises; however, the Navy is conducting ASW exercises mainly in the Offshore Area while killer whales are predominantly situated in the Inland Waters Area. Both behavioral and auditory brainstem response techniques indicate killer whales can hear a frequency range of 1 to 100 kHz and are most sensitive at 20 kHz. This is one the lowest maximum-sensitivity frequencies known among toothed whales (Szymanski *et al.*, 1999). Recovery from a threshold shift (TTS) can take a few minutes to a few days, depending on the exposure duration, sound exposure level, and the magnitude of the initial shift, with larger threshold shifts and longer exposure durations requiring longer recovery times (Finneran

et al., 2005; Mooney *et al*., 2009a; Mooney *et al*., 2009b; Finneran and Schlundt, 2010). Large threshold shifts are not anticipated for these activities because of the unlikelihood that animals will remain within the ensonified area (due to the short duration of the majority of exercises, the speed of the vessels, and the short distance within which the animal would need to approach the sound source) at high levels for the duration necessary to induce larger threshold shifts. Threshold shifts do not necessarily affect all hearing frequencies equally, so some threshold shifts may not interfere with an animal's hearing of biologically relevant sounds.

The southern resident killer whale is the only ESA-listed marine mammal species with designated critical habitat located in the NWTT Study Area (NMFS, 2006). The majority of the Navy's proposed training and testing activities would, however, not occur in the southern resident killer whale's designated critical habitat (NMFS, 2006). For all substressors that would occur within the critical habitat, those training and testing activities are not expected to impact the identified primary constituent elements of that habitat and therefore would have no effect on that critical habitat. Furthermore, the majority of testing events would occur in Hood Canal, where southern resident killer whales are not believed to be present (southern resident killer whales have not been reported in Hood Canal or Dabob Bay since 1995 [NMFS, 2008c]), while the majority of training activities would occur in the offshore portions of the Study Area where they are only present briefly during their annual migration period.

The predicted effects to southern resident killer whale would occur in the Inland Waters area of Puget Sound as a result of the Civilian Port Defense exercise (Maritime Homeland Defense/Security Mine Countermeasures Integrated Exercise) where they

could be exposed to sonar and other active acoustic sources that may result in two behavioral reactions annually. NMFS issued a Biological Opinion concluding that training and testing activities are likely to adversely affect, but are not likely to jeopardize, the continued existence of southern resident killer whale and are not likely to result in the destruction or adverse modification of critical habitat in the NWTT Study Area. As described in the Biological Opinion, the available scientific information does not provide evidence that exposure to acoustic stressors from Navy training and testing activities will impact the fitness of any individuals of this species. Therefore exposure to acoustic stressors will not have population or species level impacts.

The NWTT training and testing activities are generally not expected to occur in an area/time of specific importance for reproductive, feeding, or other known critical behaviors for killer whales. Consequently, the activities are not expected to adversely impact annual rates of recruitment or survival of killer whale species and will therefore not result in population-level impacts. As discussed in the *Area-Specific Mitigation* section of this rule, for Civilian Port Defense exercises (Maritime Homeland Defense/Security Mine Countermeasures Integrated Exercise) the Navy shall conduct pre-event planning and training to ensure environmental awareness of all exercise participants. When this event is proposed to be conducted in Puget Sound, Navy event planners shall consult with Navy biologists who shall contact NMFS during the planning process in order to determine likelihood of southern resident killer whale presence in the proposed exercise area as planners consider specifics of the event.

Pinnipeds – The Navy's acoustic analysis predicts that the following numbers of Level B harassment (TTS and behavioral reaction) may occur annually from sonar and

other active acoustic stressors and sound or energy from explosions associated with training and testing activities in the Study Area: 925 Steller sea lions (Eastern U.S. stock); 10 Guadalupe fur seals (Mexico stock); 2,960 California sea lions (U.S. stock); 4,389 northern fur seals (Eastern Pacific and California stocks); 2,596 northern elephant seals (California Breeding stock); and 63,850 harbor seals (Southeast Alaska [Clarence Strait], Oregon/Washington Coast, Washington Northern Inland Waters, Southern Puget Sound, and Hood Canal stocks). These estimates represents the total number of exposures and not necessarily the number of individuals exposed, as a single individual may be exposed multiple times over the course of a year. Northern elephant seals are the only pinnipeds predicted to incur takes (one Level B take) from exposure to explosives. The acoustic analysis (factoring in the post-model correction for avoidance and mitigation) also indicates that 2 Northern elephant seals and 100 harbor seals would be exposed to sound levels likely to result in Level A harassment (PTS) from sonar or other active acoustic sources.

Generally speaking, pinniped stocks in the Study Area are thought to be stable or increasing. Relative to population size, training and testing activities are anticipated to result only in a limited number of takes for the majority of pinniped species. When the numbers of takes are compared to the estimated stock abundances and if one assumes that each take happens to a separate animal, less than 2 percent of each Steller sea lion, California sea lion, northern fur seal, harbor seal (Southeast Alaska [Clarence Strait] only; all other harbor seal stock abundances are unknown), and northern elephant seal stock would be harassed (behaviorally) during the course of a year. Because the estimates given above represent the total number of exposures and not necessarily the

number of individuals exposed, it is more likely that fewer individuals would be taken, but a subset would be taken more than one time per year. Takes of depleted (as defined under the MMPA) stocks of northern fur seals (Eastern Pacific) and Guadalupe fur seals (Mexico) represent only 0.7 percent and 0.07 percent of their respective stock.

Research has demonstrated that for pinnipeds, as for other mammals, recovery from a hearing threshold shift (i.e., TTS; temporary partial hearing loss) can take a few minutes to a few days depending on the severity of the initial shift. More severe shifts may not fully recover and thus would be considered PTS. However, large degrees of PTS are not anticipated for these activities because of the unlikelihood that animals will remain within the ensonified area (due to the short duration of the majority of exercises, the speed of the vessels, and the short distance within which the animal would need to approach the sound source) at high levels for the duration necessary to induce larger threshold shifts. Threshold shifts do not necessarily affect all hearing frequencies equally, so threshold shifts may not necessarily interfere with an animal's ability to hear biologically relevant sounds. The likely consequences to the health of an individual that incurs PTS can range from mild to more serious, depending upon the degree of PTS and the frequency band it is in, and many animals are able to compensate for the shift, although it may include energetic costs. Likely avoidance of intense activity and sound coupled with mitigation measures would further reduce the potential for severe PTS exposures to occur. If a marine mammal is able to approach a surface vessel within the distance necessary to incur PTS, the likely speed of the vessel (nominal 10-15 knots) would make it very difficult for the animal to remain in range long enough to accumulate enough energy to result in more than a mild case of PTS.

Research and observations show that pinnipeds in the water may be tolerant of anthropogenic noise and activity (a review of behavioral reactions by pinnipeds to impulsive and non-impulsive noise can be found in Richardson *et al*., 1995 and Southall *et al*., 2007). Available data, though limited, suggest that exposures between approximately 90 and 140 dB SPL do not appear to induce strong behavioral responses in pinnipeds exposed to nonpulse sounds in water (Jacobs and Terhune, 2002; Costa *et al*., 2003; Kastelein *et al*., 2006c). Based on the limited data on pinnipeds in the water exposed to multiple pulses (small explosives, impact pile driving, and seismic sources), exposures in the approximately 150 to 180 dB SPL range generally have limited potential to induce avoidance behavior in pinnipeds (Harris *et al*., 2001; Blackwell *et al*., 2004; Miller *et al*., 2004). If pinnipeds are exposed to sonar or other active acoustic sources they may react in a number of ways depending on their experience with the sound source and what activity they are engaged in at the time of the acoustic exposure. Pinnipeds may not react at all until the sound source is approaching within a few hundred meters and then may alert, ignore the stimulus, change their behaviors, or avoid the immediate area by swimming away or diving. Houser *et al*. (2013) performed a controlled exposure study involving California sea lions exposed to a simulated MFAS signal. The purpose of this Navy-sponsored study was to determine the probability and magnitude of behavioral responses by California sea lions exposed to differing intensities of simulated MFAS signals. Behavioral reactions included increased respiration rates, prolonged submergence, and refusal to participate, among others. Younger animals were more likely to respond than older animals, while some sea lions did not respond consistently at any level. Houser *et al*.'s findings are consistent with current scientific studies and

criteria development concerning marine mammal reactions to MFAS. Effects on pinnipeds in the Study Area that are taken by Level B harassment, on the basis of reports in the literature as well as Navy monitoring from past activities, will likely be limited to reactions such as increased swimming speeds, increased surfacing time, or decreased foraging (if such activity were occurring). Most likely, individuals will simply move away from the sound source and be temporarily displaced from those areas, or not respond at all. In areas of repeated and frequent acoustic disturbance, some animals may habituate or learn to tolerate the new baseline or fluctuations in noise level. Habituation can occur when an animal's response to a stimulus wanes with repeated exposure, usually in the absence of unpleasant associated events (Wartzok *et al*., 2003). While some animals may not return to an area, or may begin using an area differently due to training and testing activities, most animals are expected to return to their usual locations and behavior. Given their documented tolerance of anthropogenic sound (Richardson *et al*., 1995 and Southall *et al*., 2007), repeated exposures of individuals (e.g., harbor seals) to levels of sound that may cause Level B harassment are unlikely to result in hearing impairment or to significantly disrupt foraging behavior. As stated above, pinnipeds may habituate to or become tolerant of repeated exposures over time, learning to ignore a stimulus that in the past has not accompanied any overt threat.

Thus, even repeated Level B harassment of some small subset of the overall stock is unlikely to result in any significant realized decrease in fitness to those individuals, and would not result in any adverse impact to the stock as a whole. Evidence from areas where the Navy extensively trains and tests provides some indication of the possible consequences resulting from those proposed activities. In the confined waters of

Washington State's Hood Canal where the Navy has been training and intensively testing for decades and harbor seals are present year-round, the population level has remained stable suggesting the area's carrying capacity likely has been reached (Jeffries *et al.*, 2003; Gaydos *et al*., 2013). Within Puget Sound there are several locations where pinnipeds use Navy structures (e.g., submarines, security barriers) for haulouts. Given that animals continue to choose these areas for their resting behavior, it would appear there are no long-term effects or consequences to those animals as a result of ongoing and routine Navy activities.

NMFS has determined that the Level A and Level B harassment exposures to the Hood Canal stock of harbor seals are not biologically significant to the population because 1) the vast majority of the exposures are within the non-injurious TTS or behavioral effects zones and none of the estimated exposures result in mortality; 2) the majority of predicted harbor seal exposures result from testing activities which are generally of an intermittent or short duration and should prevent animals from being exposed to stressors on a continuous basis; 3) there are no indications that the historically occurring activities resulting in these behavioral harassment exposures are having any effect on this population's survival by altering behavior patterns such as breeding, nursing, feeding, or sheltering; 4) the population has been stable and likely at carrying capacity (Jeffries *et al*., 2003; Gaydos *et al*., 2013); 5) the population continues to use known large haulouts in Hood Canal and Dabob Bay that are adjacent to Navy testing and training activities (London *et al*., 2012); 6) the population continues to use known haulouts for pupping; and 7) the population continues to use the waters in and around Dabob Bay and Hood Canal.

The Guadalupe fur seal is the only ESA-listed pinniped species found within the NWTT Study Area. Guadalupe fur seals are considered "seasonally migrant" and are present within the offshore portion of the Study Area during the warm season (summer and early autumn) and during that portion of the year may be exposed to sonar and other active acoustic sources associated with training and testing activities. Predicted Level B takes of Guadalupe fur seals in the Study Area represent a negligible percentage of the Mexico stock. Furthermore, critical habitat has not been designated for Guadalupe fur seals.

We believe that factors described above, as well as the available body of evidence from past Navy activities in the Study Area, demonstrate that the potential effects of the specified activity will have only short-term effects on individuals. The NWTT training and testing activities are not expected to occur in an area/time of specific importance for reproductive, feeding, or other known critical behaviors for pinnipeds. Consequently, the activities are not expected to adversely impact annual rates of recruitment or survival of pinniped species and will therefore not result in population-level impacts.

Revised Analysis Based On Corrections To Sonar Testing Activities

As discussed earlier in this final rule, the Navy revised the number of hours and the location of sonar use attributed to life cycle pierside sonar testing events already described as occurring at each of the Navy's installations in the Pacific Northwest. The resulting revised predicted exposures (take) calculations for several species as a result of these corrections are depicted in Table 18.

None of the species/stocks that could be affected by life cycle pierside testing events are listed under the ESA. Gray whale and harbor seal densities are somewhat

higher in the vicinity of Naval Station Everett (Possession Sound) than they are near NBK – Bremerton (Sinclair Inlet). While gray whales seasonally occur in the vicinity of Naval Station Everett, they are rarely sighted as far inside Puget Sound as NBK – Bremerton. The net change in annual testing effects reflects these environmental differences. However, the net change represents a less than 5 percent increase in predicted annual Level A harassments and a less than 1 percent increase in predicted annual Level B harassments across all sonar and explosive testing activities proposed to occur within the NWTT Study Area.

The species with the most potential for harassment by this correction – Dall's porpoise, Steller sea lions, California sea lions, harbor seals, and harbor porpoise – are all species/stocks with robust, stable populations. All these species/stocks are also predicted to be affected by pierside surface ship sonar maintenance events at Naval Station Everett, and by life cycle pierside sonar testing events at NBK – Bremerton already accounted for in Navy and NMFS analyses. The longer duration of the testing events is predicted to result in 8 Level A harassment exposures of harbor seals; Level A harassment would not be incurred from the shorter duration training events. In addition, the analysis shows that the longer MF1 testing events could result in 1 Level B harassment (by temporary threshold shift [TTS]) of a gray whale. The shorter duration pierside surface ship sonar maintenance training events at Naval Station Everett would not affect this species, and effects to this species were not predicted for life cycle pierside sonar testing at NBK - Bremerton.

As a result of the correction, the gray whale is the only species with predicted effects at Naval Station Everett that was not predicted to have effects at NBK –

Bremerton. If a gray whale were to experience a TTS, its hearing sensitivity would only be affected for a short duration of time (a few minutes to a few days), and any effect on its hearing would be in a very narrow bandwidth equivalent to the exposure. Because marine mammals hear over a large range of frequencies, they are likely to be able to compensate for any temporary reduction in sensitivity over a small frequency band. Therefore, TTS is unlikely to affect their ability to carry out necessary life functions (i.e., feeding, breeding, communication), and no long-term effects on their fitness would be expected.

The species with the greatest increase in predicted exposures and for which the only instances of Level A takes are predicted are harbor seals from the Washington Northern Inland Waters stock. The net change in annual testing exposures would not alter the conclusions of the analysis presented above for harbor seals in this section or in the NWTT FEIS/OEIS.

In summary, correcting the number of life cycle pierside sonar testing event hours will result in an insignificant increase in overall Level B and Level A takes of a few species within the NWTT Study Area. All populations are healthy and exposures to sound from these events would be short term (no more than 4 hours) and infrequent (a maximum of 8 times per year). These testing events are qualitatively described in documents released to the public as potentially occurring at both NBK – Bremerton and Naval Station Everett. Furthermore, the testing events are similar to pierside surface ship sonar system maintenance training events using MF1 sonar systems also proposed to occur at Naval Station Everett that were quantitatively analyzed in public documents and pose similar potential effects on marine mammals. Therefore, the addition of life cycle

pierside sonar testing events to Naval Station Everett and their associated predicted exposures does not reflect a significant departure from or a substantial change in the nature of activities or environmental effects already analyzed as potentially occurring there, and NMFS concludes that no long-term consequences to or significant impacts on marine mammal species/stocks would be expected.

Long-Term Consequences

The best assessment of long-term consequences from training and testing activities will be to monitor the populations over time within a given Navy range complex. A U.S. workshop on Marine Mammals and Sound (Fitch *et al*., 2011) indicated a critical need for baseline biological data on marine mammal abundance, distribution, habitat, and behavior over sufficient time and space to evaluate impacts from human-generated activities on long-term population survival. The Navy has developed monitoring plans for protected marine mammals occurring on Navy ranges with the goal of assessing the impacts of training and testing activities on marine species and the effectiveness of the Navy's current mitigation practices. Continued monitoring efforts over time will be necessary to completely evaluate the long-term consequences of exposure to noise sources.

Since 2006 across all Navy Range Complexes (in the Atlantic, Gulf of Mexico, and the Pacific), there have been more than 80 reports; including Major Exercise Reports, Annual Exercise Reports, and Monitoring Reports. For the Pacific since 2011, there have been 29 monitoring and exercise reports (as shown in Table 6-1 of the LOA application) submitted to NMFS to further research goals aimed at understanding the Navy's impact on the environment as it carries out its mission to train and test.

In addition to this multi-year record of reports from across the Navy, there have also been ongoing Behavioral Response Study research efforts (in Southern California and the Bahamas) specifically focused on determining the potential effects from Navy MFAS (Southall *et al*., 2011, 2012; Tyack *et al*., 2011; DeRuiter *et al*., 2013b; Goldbogen *et al*., 2013; Moretti *et al*., 2014). This multi-year compendium of monitoring, observation, study, and broad scientific research is informative with regard to assessing the effects of Navy training and testing in general. Given that this record involves many of the same Navy training and testing activities being considered for the Study Area, and because it includes all the marine mammal taxonomic families and many of the same species, this compendium of Navy reporting is directly applicable to the Study Area. Other research findings related to the general topic of long-term impacts are discussed above in the Species/Group Specific Analysis.

Based on the findings from surveys in Puget Sound and research efforts and monitoring before, during, and after training and testing events across the Navy since 2006, NMFS' assessment is that it is unlikely there would be impacts to populations of marine mammals having any long-term consequences as a result of the proposed continuation of training and testing in the ocean areas historically used by the Navy, including the Study Area. This assessment of likelihood is based on four indicators from areas in the Pacific where Navy training and testing has been ongoing for decades: (1) evidence suggesting or documenting increases in the numbers of marine mammals present (Calambokidis and Barlow, 2004; Calambokidis *et al*., 2009a; Falcone *et al.*, 2009; Hildebrand and McDonald, 2009; Berman-Kowalewski *et al*., 2010; Moore and Barlow, 2011; Barlow *et al*. 2011; Falcone and Shorr, 2012; Kerosky *et al*,. 2012; Širović

et al., 2015; Smultea *et al*., 2013), (2) examples of documented presence and site fidelity of species and long-term residence by individual animals of some species (Hooker *et al*., 2002; McSweeney *et al*., 2007; McSweeney *et al*., 2009; McSweeney *et al*., 2010; Martin and Kok, 2011; Baumann-Pickering *et al*., 2012; Falcone and Schorr, 2014), (3) use of training and testing areas for breeding and nursing activities (Littnan, 2010), and (4) 6 years of comprehensive monitoring data indicating a lack of any observable effects to marine mammal populations as a result of Navy training and testing activities.

To summarize, while the evidence covers most marine mammal taxonomic suborders, it is limited to a few species and only suggestive of the general viability of those species in intensively used Navy training and testing areas (Barlow *et al*., 2011; Calambokidis *et al*., 2009b; Falcone *et al*., 2009; Littnan, 2011; Martin and Kok, 2011; McCarthy *et al*., 2011; McSweeney *et al*., 2007; McSweeney *et al*., 2009; Moore and Barlow, 2011; Tyack *et al*., 2011; Southall *et al*., 2012a; Melcon, 2012; Goldbogen, 2013; Baird *et al*., 2013). However, there is no direct evidence that routine Navy training and testing spanning decades has negatively impacted marine mammal populations at any Navy Range Complex. Although there have been a few strandings associated with use of sonar in other locations (see U.S. Department of the Navy, 2013b), Ketten (2012) has recently summarized, "to date, there has been no demonstrable evidence of acute, traumatic, disruptive, or profound auditory damage in any marine mammal as the result of anthropogenic noise exposures, including sonar." Therefore, based on the best available science (Barlow *et al*., 2011; Falcone *et al*., 2009; Falcone and Schorr, 2012, 2014; Littnan, 2011; Martin and Kok, 2011; McCarthy *et al*., 2011; McSweeney *et al*., 2007; McSweeney *et al*., 2009; Moore and Barlow, 2011; Tyack *et al*., 2011; Southall *et*

al., 2012; Manzano-Roth *et al.*, 2013; DeRuiter *et al*., 2013b; Goldbogen *et al*., 2013; Moretti *et al*., 2014; Smultea and Jefferson, 2014), including data developed in the series of reports submitted to NMFS, we believe that long-term consequences for individuals or populations are unlikely to result from Navy training and testing activities in the Study Area.

Final Determination

Training and testing activities proposed in the NWTT Study Area would result in Level B and Level A takes, as summarized in Tables 14 - 18. Based on best available science, as summarized in this rule and in the NWTT FEIS/OEIS (Section 3.4.4.1), NMFS concludes that exposures to marine mammal species and stocks due to NWTT activities would result in primarily short-term (temporary and short in duration) and relatively infrequent effects to most individuals exposed, and not of the type or severity that would be expected to be additive for the generally small portion of the stocks and species likely to be exposed.

Chapter 4 of the NWTT FEIS/OEIS contains a comprehensive assessment of potential cumulative impacts, including analyzing the potential for cumulatively significant impacts to the marine environment and marine mammals. In addition, the Biological Opinion concludes that the proposed regulations and any take associated with activities authorized by those regulations are not likely to jeopardize the continued existence of threatened or endangered species (or species proposed for listing) in the action area during any single year or as a result of the cumulative impacts of a 5-year authorization. The Biological Opinion includes an explanation of how the results of

NMFS' baseline and effects analyses in Biological Opinions relate to those contained in the cumulative impact section of the NWTT FEIS/OEIS.

Marine mammal takes from Navy activities are not expected to impact annual rates of recruitment or survival and will therefore not result in population-level impacts for the following reasons:

- Most acoustic exposures (greater than 99 percent) are within the non-injurious TTS or behavioral effects zones (Level B harassment consisting of generally temporary modifications in behavior) and none of the estimated exposures result in mortality.
- As mentioned earlier, an animal's exposure to a higher received level is more likely to result in a behavioral response that is more likely to adversely affect the health of the animal. For low frequency cetaceans (mysticetes) in the Study Area, most Level B exposures will occur at received levels less than 156 dB. The majority of estimated odontocete takes from MFAS/HFAS (at least for hull-mounted sonar, which is responsible for most of the sonar-related takes) also result from exposures to received levels less than 156 dB. Therefore, the majority of Level B takes are expected to be in the form of milder responses (i.e., lower-level exposures that still rise to the level of a take, but would likely be less severe in the range of responses that qualify as a take) and are not expected to have deleterious impacts on the fitness of any individuals.
- Acoustic disturbances caused by Navy sonar and explosives are short-term, intermittent, and (in the case of sonar) transitory. Moreover, there are no MTEs in the NWTT Study Area. Navy activities are generally unit level. Unit level events

occur over a small spatial scale (one to a few 10s of square miles) and with few participants (usually one or two). Single-unit unit level training would typically involve a few hours of sonar use, with a typical nominal ping of every 50 seconds (duty cycle). Even though an animal's exposure to active sonar may be more than one time, the intermittent nature of the sonar signal, its low duty cycle, and the fact that both the vessel and animal are moving provide a very small chance that exposure to active sonar for individual animals and stocks would be repeated over extended periods of time. Consequently, we would not expect the Navy's activities to create conditions of long-term, continuous underwater noise leading to habitat abandonment or long-term hormonal or physiological stress responses in marine mammals.

- Range complexes where intensive training and testing have been occurring for decades have populations of multiple species with strong site fidelity (including highly sensitive resident beaked whales at some locations) and increases in the number of some species. Populations of beaked whales and other odontocetes in the Bahamas, and other Navy fixed ranges that have been operating for tens of years, appear to be stable.
- Years of monitoring of Navy-wide activities (since 2006) have documented hundreds of thousands of marine mammals on the range complexes and there are only two instances of overt behavioral change that have been observed.
- Years of monitoring of Navy-wide activities on the range complexes have documented no demonstrable instances of injury to marine mammals as a direct result of non-impulsive acoustic sources.

- In at least three decades of the same type of activities, only one instance of injury to marine mammals (March 4, 2011; three long-beaked common dolphin off Southern California) has occurred as a known result of training or testing using an impulsive source (underwater explosion). Of note, the time-delay firing underwater explosive training activity implicated in the March 4 incident is not proposed for the training activities in the NWTT Study Area.

Based on the analysis contained herein of the likely effects of the specified activity on marine mammals and their habitat, which includes consideration of the materials provided in the Navy's LOA application and NWTT FEIS/OEIS, and dependent upon the implementation of the mitigation and monitoring measures, NMFS finds that the total marine mammal take from the Navy's training and testing activities in the NWTT Study Area will have a negligible impact on the affected marine mammal species or stocks. NMFS has issued regulations for these activities that prescribe the means of effecting the least practicable adverse impact on marine mammal species or stocks and their habitat and set forth requirements pertaining to the monitoring and reporting of that taking.

Subsistence Harvest of Marine Mammals

There are no relevant subsistence uses of marine mammals implicated by this action. Therefore, NMFS has 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.

ESA

There are nine marine mammal species under NMFS jurisdiction that are listed as endangered or threatened under the ESA with confirmed or possible occurrence in the NWTT Study Area: North Pacific right whale, blue whale, humpback whale, fin whale, sei whale, gray whale (Western North Pacific stock), sperm whale, killer whale (Eastern North Pacific Southern Resident stock), and Guadalupe fur seal. The Navy consulted with NMFS pursuant to section 7 of the ESA, and NMFS also consulted internally on the issuance of a rule and LOAs under section 101(a)(5)(A) of the MMPA for NWTT activities. NMFS issued a Biological Opinion concluding that the issuance of the rule and subsequent LOAs are likely to adversely affect, but are not likely to jeopardize, the continued existence of the threatened and endangered species (and species proposed for listing) under NMFS' jurisdiction and are not likely to result in the destruction or adverse modification of critical habitat in the NWTT Study Area. The Biological Opinion for this action is available on NMFS' website (*http://www.nmfs.noaa.gov/pr/permits/incidental/military.htm*).

NEPA

NMFS participated as a cooperating agency on the NWTT FEIS/OEIS, which was published on October 2, 2015 and is available on the Navy's website: *http://www.nwtteis.com*. NMFS determined that the NWTT FEIS/OEIS is adequate and appropriate to meet our responsibilities under NEPA for the issuance of regulations and LOAs and adopted the Navy's NWTT FEIS/OEIS.

NMSA

Some Navy NWTT activities will occur within the Olympic Coast National Marine Sanctuary (OCNMS). Federal agency actions that are likely to injure sanctuary

resources are subject to consultation with the NOAA Office of National Marine Sanctuaries (ONMS) under section 304(d) of the National Marine Sanctuaries Act (NMSA) to determine if there are reasonable and prudent alternatives to the proposed action that will protect sanctuary resources. The Navy and NMFS initiated joint consultation with ONMS through the submittal of a Sanctuary Resource Statement (SRS) on August 31, 2015, with follow-up information provided to ONMS on October 1, 2015. The SRS provided by the Navy and NMFS estimated the numbers of marine mammals within the OCNMS that could be exposed, annually, to acoustic transmissions associated with NWTT activities. The impacts of these exposures were predicted as numbers of marine mammals that could experience temporary and permanent threshold shifts and behavioral responses, all of which constitute "injury" as defined by the NMSA. ONMS provided recommended alternatives to the Navy and NMFS to further protect sanctuary resources on October 23, 2015. On November 9, 2015, the Navy and NMFS jointly responded in writing to each of the ONMS recommendations.

Classification

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

Pursuant to the Regulatory Flexibility Act (RFA), the Chief Counsel for Regulation of the Department of Commerce certified to the Chief Counsel for Advocacy of the Small Business Administration at the proposed rule stage that this rule would not have a significant economic impact on a substantial number of small entities. The Navy is the sole entity that would be affected by this rulemaking, and the Navy is not a small governmental jurisdiction, small organization, or small business, as defined by the RFA.

Any requirements imposed by an LOA issued pursuant to these regulations, and any monitoring or reporting requirements imposed by these regulations, would be applicable only to the Navy. NMFS does not expect the issuance of these regulations or the associated LOAs to result in any impacts to small entities pursuant to the RFA. Because this action, if adopted, would directly affect the Navy and not a small entity, NMFS concludes the action would not result in a significant economic impact on a substantial number of small entities.

The Assistant Administrator for Fisheries has determined that there is good cause under the Administrative Procedure Act (5 U.S.C 553(d)(3)) to waive the 30-day delay in the effective date of the measures contained in the final rule. NMFS is unable to accommodate the 30-day delay of effectiveness due to delays in the release of this rule which resulted from an initial delay in the publication of the proposed rule. That delay occurred when updated species density information became available immediately prior to the release of the proposed rule. As those new data represented the best available science at the time, NMFS determined that it was necessary to incorporate those data, and the resulting analyses, into the proposed rule, which was subsequently delayed due to the added time needed to perform the additional analyses and provide the necessary revisions to the notice of the proposed rule. The Navy is the only entity subject to the regulations, and it has informed NMFS that it requests that this final rule take effect by November 9, 2015, when the regulations issued by NMFS to govern the unintentional taking of marine mammals incidental to the Navy's activities in the Northwest Training Range Complex and the Keyport Range Complex from 2010 to 2015 expire. A waiver of the 30-day delay of the effective date of the final rule will allow the Navy to finalize operational

procedures to ensure compliance with required mitigation, monitoring, and reporting requirements, and have MMPA authorization in place prior to expiration of the existing regulations to support unit level training and testing activities events scheduled for November 2015. Any delay of enacting the final rule would result in either: (1) A suspension of planned naval training, which would disrupt vital training essential to national security; or (2) the Navy's procedural non-compliance with the MMPA (should the Navy conduct training without an LOA), thereby resulting in the potential for unauthorized takes of marine mammals. Moreover, the Navy is ready to implement the rule immediately. For these reasons, the Assistant Administrator finds good cause to waive the 30-day delay in the effective date.

List of Subjects in 50 CFR Part 218

Exports, Fish, Imports, Incidental take, Indians, Labeling, Marine mammals, Navy, Penalties, Reporting and recordkeeping requirements, Seafood, Sonar, Transportation.

Dated: November 9, 2015

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Samuel D. Rauch III,

Deputy Assistant Administrator for Regulatory Programs,

National Marine Fisheries Service.

For reasons set forth in the preamble, 50 CFR part 218 is amended as follows:

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

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

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

2. In § 218.75, revise introductory paragraph (f)(1)(ii)(F) to read as follows:

§ 218.75 Requirements for monitoring and reporting.

*****

(f) ***

(1) ***

(ii) ***

(F) Individual marine mammal sighting information for each sighting when mitigation occurred during each MTE.

*****

3. In § 218.85, revise introductory paragraph (f)(1)(ii)(F) to read as follows:

§ 218.85 Requirements for monitoring and reporting.

*****

(f) ***

(1) ***

(ii) ***

(F) Individual marine mammal sighting information for each sighting when mitigation occurred during each MTE.

*****

4. In § 218.95, revise introductory paragraph (g)(1)(ii)(F) to read as follows:

§ 218.95 Requirements for monitoring and reporting.

*****

(g) ***

(1) ***

(ii) ***

(F) Individual marine mammal sighting information for each sighting when mitigation occurred during each MTE.

*****

5. In § 218.125, revise introductory paragraph (f)(1)(ii) to read as follows:

§ 218.125 Requirements for monitoring and reporting.

*****

(f) ***

(1) ***

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

*****

Subpart M – [Removed and Reserved]

5. Remove and reserve subpart M, consisting of §§ 218.110 through 218.119.

Subpart R – [Removed and Reserved]

6. Remove and reserve subpart R, consisting of §§ 218.170 through 218.178.

7. Subpart O is added to part 218 to read as follows:

Subpart O – Taking and Importing Marine Mammals; U.S. Navy's Northwest Training and Testing (NWTT) Study Area

Sec.

218.140 Specified activity and specified geographical region.

218.141 Effective dates.

218.142 Permissible methods of taking.

218.143 Prohibitions.

218.144 Mitigation.

218.145 Requirements for monitoring and reporting.

218.146 Applications for Letters of Authorization

218.147 Letters of Authorization.

218.148 Renewal and Modifications of Letters of Authorization and Adaptive Management.

Subpart O – Taking and Importing Marine Mammals; U.S. Navy's Northwest Training and Testing (NWTT) Study Area

§ 218.140 Specified activity and specified geographical region.

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

(b) The taking of marine mammals by the Navy is only authorized if it occurs within the NWTT Study Area, which is composed of established maritime operating and warning areas in the eastern North Pacific Ocean region, including areas of the Strait of Juan de Fuca, Puget Sound, and Western Behm Canal in southeastern Alaska. The Study

Area includes air and water space within and outside Washington state waters, and outside state waters of Oregon and Northern California. The Study Area includes four existing range complexes and facilities: the Northwest Training Range Complex (NWTRC), the Keyport Range Complex, Carr Inlet Operations Area, and SEAFAC. In addition to these range complexes, the Study Area also includes Navy pierside locations where sonar maintenance and testing occurs as part of overhaul, modernization, maintenance and repair activities at NAVBASE Kitsap, Bremerton; NAVBASE Kitsap, Bangor; and Naval Station Everett.

(c) The taking of marine mammals by the Navy is only authorized if it occurs incidental to the following activities within the designated amounts of use:

(1) Sonar and other Active Sources Used During Training:

(i) Mid-frequency (MF) Source Classes:

(A) MF1 – an average of 166 hours per year.

(B) MF3 – an average of 70 hours per year.

(C) MF4 – an average of 4 hours per year.

(D) MF5 – an average of 896 items per year.

(E) MF11 – an average of 16 hours per year.

(ii) High-frequency (HF) Source Classes:

(A) HF1 – an average of 48 hours per year.

(B) HF4 – an average of 384 hours per year.

(C) HF6 – an average of 192 hours per year

(iii) Anti-Submarine Warfare (ASW) Source Classes:

(A) ASW2 – an average of 720 items per year per year.

(B) ASW3 – an average of 78 hours per year.

(2) Sonar and other Active Sources Used During Testing:

(i) Low-frequency (LF) Source Classes:

(A) LF4 – an average of 110 hours per year.

(B) LF5 – an average of 71 hours per year.

(ii) Mid-frequency (MF):

(A) MF1 – an average of 32 hours per year

(B) MF3 – an average of 145 hours per year.

(C) MF4 – an average of 10 hours per year.

(D) MF5 – an average of 273 items per year.

(E) MF6 – an average of 12 items per year.

(F) MF8 – an average of 40 hours per year.

(G) MF9 – an average of 1,183 hours per year.

(H) MF10 – an average of 1,156 hours per year.

(I) MF11 – an average of 34 hours per year.

(J) MF12 – an average of 24 hours per year.

(iii) High-frequency (HF) and Very High-frequency (VHF):

(A) HF1 – an average of 161 hours per year.

(B) HF3 – an average of 145 hours per year.

(C) HF5 – an average of 360 hours per year.

(D) HF6 – an average of 2,099 hours per year.

(iv) VHF:

(A) VHF2 - an average of 35 hours per year.

(B) [Reserved]

(v) ASW:

(A) ASW1 – an average of 16 hours per year.

(B) ASW2 – an average of 64 hours per year.

(C) ASW2 – an average of 170 items per year.

(D) ASW3 – an average of 444 hours per year.

(E) ASW4 – an average of 1,182 items per year.

(vi) Acoustic Modems (M):

(A) M3 - an average of 1,519 hours per year.

(B) [Reserved]

(vii) Torpedoes (TORP):

(A) TORP1 – an average of 315 items per year.

(B) TORP2 – an average of 299 items per year.

(viii) Swimmer Detection Sonar (SD):

(A) SD1 – an average of 757 hours per year.

(B) [Reserved]

(ix) Synthetic Aperture Sonar (SAS):

(A) SAS2 – an average of 798 hours per year.

(B) [Reserved]

(3) Impulsive Source Detonations During Training:

(i) Explosive Classes:

(A) E1 (0.1 to 0.25 pound [lb] NEW) – an average of 48 detonations per year.

(B) E3 (>0.5 to 2.5 lb NEW) – an average of 6 detonations per year.

(C) E5 (>5 to 10 lb NEW) – an average of 80 detonations per year.

(D) E10 (>250 to 500 lb NEW) – an average of 4 detonations per year.

(E) E12 (>650 to 1,000 lb NEW) – an average of 10 detonations per year.

(ii) [Reserved]

(4) Impulsive Source Detonations During Testing:

(i) Explosive Classes:

(A) E3 (>0.5 to 2.5 lb NEW) – an average of 72 detonations per year.

(B) E4 (>2.5 to 5 lb NEW) – an average of 140 detonations (70 sonobuoys) per year.

(C) E8 (>60 to 100 lb NEW) – an average of 3 detonations per year.

(D) E11 (>500 to 650 lb NEW) – an average of 3 detonations per year.

(ii) [Reserved]

§ 218.141 Effective dates

Regulations in this subpart are effective November 9, 2015 through November 8, 2020.

§ 218.142 Permissible methods of taking.

(a) Under Letters of Authorization (LOAs) issued pursuant to § 218.147, the Holder of, and those operating under, the LOA may incidentally, but not intentionally, take marine mammals within the area described in § 218.140, provided the activity is in compliance with all terms, conditions, and requirements of these regulations and the appropriate LOA.

(b) The activities identified in § 218.140(c) must be conducted in a manner that minimizes, to the greatest extent practicable, any adverse impacts on marine mammals and their habitat.

(c) The incidental take of marine mammals under the activities identified in § 218.140(c) is limited to the following species, by the identified method of take and the indicated number of times:

(1) Level B Harassment for all Training Activities:

(i) Mysticetes:

(A) Blue whale (*Balaenoptera musculus*), Eastern North Pacific – 25 (an average of 5 per year).

(B) Fin whale (*Balaenoptera physalus*), California, Oregon, and Washington (CA/OR/WA) – 125 (an average of 25 per year).

(C) Gray whale (*Eschrichtius robustus*), Eastern North Pacific – 30 (an average of 6 per year).

(D) Humpback whale (*Megaptera novaeangliae*), CA/OR/WA – 60 (an average of 12 per year).

(E) Minke whale (*Balaenoptera acutorostrata*), CA/OR/WA – 90 (an average of 18 per year).

(ii) Odontocetes:

(A) Baird's beaked whale (*Berardius bairdii*), CA/OR/WA – 2,955 (an average of 591 per year).

(B) Mesoplodont beaked whale (*Mesoplodon* spp.), CA/OR/WA – 7,085 (an average of 1,417 per year).

(C) Cuvier's beaked whale (*Ziphius cavirostris*), CA/OR/WA – 1,765 (an average of 353 per year).

(D) Dall's porpoise (*Phocoenoidea dalli*), CA/OR/WA – 18,178 (an average of 3,730 per year).

(E) Harbor porpoise (*Phocoena phocoena*), Northern OR/WA Coast – 175,030 (an average of 35,006 per year).

(F) Harbor porpoise (*Phocoena phocoena*), Northern CA/Southern OR – 262,545 (an average of 52,509 per year).

(G) Harbor porpoise (*Phocoena phocoena*), WA Inland Waters – 4,409 (an average of 1,417 per year).(H) Killer whale (*Orcinus orca*), West Coast Transient – 39 (an average of 9 per year).

(I) Killer whale (*Orcinus orca*), Eastern North Pacific Offshore – 65 (an average of 13 per year).

(J) Killer whale (*Orcinus orca*), Eastern North Pacific Southern Resident – 6 (an average of 2 per year).

(K) *Kogia* spp., CA/OR/WA – 365 (an average of 73 per year).

(L) Northern right whale dolphin (*Lissodelphis borealis*), CA/OR/WA – 6,660 (an average of 1,332 per year).

(M) Pacific white-sided dolphin (*Lagenorhynchus obliquidens*), CA/OR/WA – 17,408 (an average of 3,482 per year).

(N) Risso's dolphin (*Grampus griseus*), CA/OR/WA – 3,285 (an average of 657 per year).

(O) Short-beaked common dolphin (*Delphinus delphis*), CA/OR/WA – 3,670 (an average of 734 per year).

(P) Sperm whale (*Physeter macrocephalus*), CA/OR/WA – 405 (an average of 81 per year).

(Q) Striped dolphin (*Stenella coerulealba*), CA/OR/WA – 110 (an average of 22 per year).

(iii) Pinnipeds:

(A) California sea lion (*Zalophus californianus*), U.S. – 4,038 (an average of 814 per year).

(B) Steller sea lion (*Eumetopias jubatus*), Eastern U.S. – 1,986 (an average of 404 per year).

(C) Guadalupe fur seal (*Arctocephalus townsendi*), Mexico – 35 (an average of 7 per year).

(D) Harbor seal (*Phoca vitulina*), WA Northern Inland Waters – 1,855 (an average of 427 per year).

(E) Harbor seal (*Phoca vitulina*), Southern Puget Sound – 252 (an average of 58 per year).

(F) Harbor seal (*Phoca vitulina*), Hood Canal – 2,054 (an average of 452 per year).

(G) Northern elephant seal (*Mirounga angustirostris*), CA Breeding – 6,353 (an average of 1,271 per year).

(H) Northern fur seal (*Callorhinus ursinus*), Eastern Pacific – 12,475 (an average of 2,495 per year).

(I) Northern fur seal (*Callorhinus ursinus*), California – 185 (an average of 37 per year).

(2) Level A Harassment for all Training Activities:

(i) Mysticetes:

(A) [Reserved]

(B) [Reserved]

(ii) Odontocetes:

(A) Dall's porpoise (*Phocoenoidea dalli*), CA/OR/WA – 20 (an average of 4 per year).

(B) Harbor porpoise (*Phocoena phocoena*), WA Inland Waters – 5 (an average of 1 per year).

(iii) Pinnipeds:

(A) Harbor seal (*Phoca vitulina*), WA Northern Inland Waters – 20 (an average of 4 per year).

(B) Harbor seal (*Phoca vitulina*), Hood Canal – 10 (an average of 2 per year).

(C) [Reserved]

(3) Level B Harassment for all Testing Activities:

(i) Mysticetes:

(A) Blue whale (*Balaenoptera musculus*), Eastern North Pacific – 30 (an average of 6 per year).

(B) Fin whale (*Balaenoptera physalus*), CA/OR/WA – 170 (an average of 34 per year).

(C) Fin whale (*Balaenoptera physalus*), Northeast Pacific – 10 (an average of 2 per year).

(D) Gray whale (*Eschrichtius robustus*), Eastern North Pacific – 60 (an average of 12 per year).

(E) Humpback whale (*Megaptera novaeangliae*), Central North Pacific – 5 (an average of 1 per year).

(F) Humpback whale (*Megaptera novaeangliae*), CA/OR/WA – 220 (an average of 44 per year).

(G) Minke whale (*Balaenoptera acutorostrata*), CA/OR/WA – 90 (an average of 18 per year).

(H) Sei whale (*Balaenoptera borealis*), Eastern North Pacific – 10 (an average of 2 per year).

(ii) Odontocetes:

(A) Baird's beaked whale (*Berardius bairdii*), Alaska – 125 (an average of 25 per year).

(B) Baird's beaked whale (*Berardius bairdii*), CA/OR/WA – 745 (an average of 149 per year).

(C) Mesoplodont beaked whale (*Mesoplodon* spp.), CA/OR/WA – 1,845 (an average of 369 per year).

(D) Cuvier's beaked whale (*Ziphius cavirostris*), Alaska – 75 (an average of 15 per year).

(E) Cuvier's beaked whale (*Ziphius cavirostris*), CA/OR/WA – 455 (an average of 91 per year).

(F) Dall's porpoise (*Phocoenoidea dalli*), Alaska – 6,000 (an average of 1,200 per year).

(G) Dall's porpoise (*Phocoenoidea dalli*), CA/OR/WA – 50,785 (an average of 10,157 per year).

(H) Harbor porpoise (*Phocoena phocoena*), Southeast Alaska – 4,630 (an average of 926 per year).

(I) Harbor porpoise (*Phocoena phocoena*), Northern OR/WA Coast – 86,060 (an average of 17,212 per year).

(J) Harbor porpoise (*Phocoena phocoena*), Northern CA/Southern OR – 129,095 (an average of 25,819 per year).

(K) Harbor porpoise (*Phocoena phocoena*), WA Inland Waters – 27,045 (an average of 5,409 per year).

(L) Killer whale (*Orcinus orca*), Alaska Resident – 10 (an average of 2 per year).

(M) Killer whale (*Orcinus orca*), West Coast Transient – 1,035 (an average of 207 per year).

(N) Killer whale (*Orcinus orca*), Eastern North Pacific Offshore – 110 (an average of 22 per year).

(O) *Kogia* spp., CA/OR/WA – 530 (an average of 106 per year).

(P) Northern right whale dolphin (*Lissodelphis borealis*), CA/OR/WA – 10,190 (an average of 2,038 per year).

(Q) Pacific white-sided dolphin (*Lagenorhynchus obliquidens*), North Pacific – 15 (an average of 3 per year).

(R) Pacific white-sided dolphin (*Lagenorhynchus obliquidens*), CA/OR/WA – 24,345 (an average of 4,869 per year).

(S) Risso's dolphin (*Grampus griseus*), CA/OR/WA – 5,770 (an average of 1,154 per year).

(T) Short-beaked common dolphin (*Delphinus delphis*), CA/OR/WA – 8,140 (an average of 1,628 per year).

(U) Sperm whale (*Physeter macrocephalus*), CA/OR/WA – 390 (an average of 78 per year).

(V) Striped dolphin (*Stenella coerulealba*), CA/OR/WA – 70 (an average of 14 per year).

(iii) Pinnipeds:

(A) California sea lion (*Zalophus californianus*), U.S. – 10,730 (an average of 2,146 per year).

(B) Steller sea lion (*Eumetopias jubatus*), Eastern U.S. – 2,605 (an average of 521 per year).

(C) Guadalupe fur seal (*Arctocephalus townsendi*), Mexico – 15 (an average of 3 per year).

(D) Harbor seal (*Phoca vitulina*), Southeast Alaska (Clarence Sound) – 110 (an average of 22 per year).

(E) Harbor seal (*Phoca vitulina*), OR/WA Coast – 8,275 (an average of 1,655 per year).

(F) Harbor seal (*Phoca vitulina*), WA Northern Inland Waters – 9,115 (an average of 1,823 per year).

(G) Harbor seal (*Phoca vitulina*), Southern Puget Sound – 980 (an average of 196 per year).

(H) Harbor seal (*Phoca vitulina*), Hood Canal – 296,085 (an average of 59,217 per year).

(I) Northern elephant seal (*Mirounga angustirostris*), CA Breeding – 6,625 (an average of 1,325 per year).

(J) Northern fur seal (*Callorhinus ursinus*), Eastern Pacific – 9,150 (an average of 1,830 per year).

(K) Northern fur seal (*Callorhinus ursinus*), California – 135 (an average of 27 per year).

(4) Level A Harassment for all Testing Activities:

(i) Mysticetes:

(A) Gray whale (*Eschrichtius robustus*), Eastern North Pacific – 5 (an average of 1 per year).

(B) [Reserved]

(ii) Odontocetes:

(A) *Kogia* spp., CA/OR/WA – 5 (an average of 1 per year).

(B) Dall' porpoise (*Phocoenoidea dalli*), CA/OR/WA – 215 (an average of 43 per year).

(C) Harbor porpoise (*Phocoena phocoena*), Northern OR/WA Coast – 75 (an average of 15 per year).

(D) Harbor porpoise (*Phocoena phocoena*), Northern CA/Southern OR – 115 (an average of 23 per year).

(E) Harbor porpoise (*Phocoena phocoena*), WA Inland Waters – 30 (an average of 6 per year).

(iii) Pinnipeds:

(A) Harbor seal (*Phoca vitulina*), OR/WA Coast – 20 (an average of 4 per year).

(B) Harbor seal (*Phoca vitulina*), WA Northern Inland Waters – 110 (an average of 22 per year).

(C) Harbor seal (*Phoca vitulina*), Southern Puget Sound – 5 (an average of 1 per year).

(D) Harbor seal (*Phoca vitulina*), Hood Canal – 335 (an average of 67 per year).

(E) Northern elephant seal (*Mirounga angustirostris*), CA Breeding – 10 (an average of 2 per year).

(F) [Reserved]

§ 218.143 Prohibitions.

Notwithstanding takings contemplated in § 218.142 and authorized by an LOA issued under §§ 216.106 and 218.147 of this chapter, no person in connection with the activities described in § 218.140 may:

(a) Take any marine mammal not specified in § 218.142(c);

(b) Take any marine mammal specified in § 218.142(c) other than by incidental take as specified in § 218.142(c);

(c) Take a marine mammal specified in § 218.142(c) if such taking results in more than a negligible impact on the species or stocks of such marine mammal; or

(d) Violate, or fail to comply with, the terms, conditions, and requirements of these regulations or an LOA issued under §§ 216.106 and 218.147.

§ 218.144 Mitigation.

(a) When conducting training and testing activities, as identified in § 218.140, the mitigation measures contained in the LOA issued under §§ 216.106 and 218.147 of this chapter must be implemented. These mitigation measures include, but are not limited to:

(1) *Lookouts* – The following are protective measures concerning the use of Lookouts.

(i) Lookouts positioned on surface ships will be dedicated solely to diligent observation of the air and surface of the water. Their observation objectives will include, but are not limited to, detecting the presence of biological resources and recreational or fishing boats, observing mitigation zones, and monitoring for vessel and personnel safety concerns.

(ii) Lookouts positioned ashore, in aircraft or on boats will, to the maximum extent practicable and consistent with aircraft and boat safety and training and testing requirements, comply with the observation objectives described in paragraph (a)(1)(i) of this section.

(iii) Lookout measures for non-impulsive sound:

(A) With the exception of vessels less than 65 ft (20 m) in length or minimally manned vessels, ships using low-frequency or hull-mounted mid-frequency active sonar sources associated with anti-submarine warfare and mine warfare activities at sea will have two Lookouts at the forward position of the vessel. For the purposes of this rule, low-frequency active sonar does not include surface towed array surveillance system low-frequency active sonar.

(B) While using low-frequency or hull-mounted mid-frequency active sonar sources associated with anti-submarine warfare and mine warfare activities at sea, vessels less than 65 ft (20 m) in length or minimally manned vessels will have one Lookout at the forward position of the vessel due to space and manning restrictions.

(C) Ships conducting active sonar activities while moored or at anchor (including pierside or shore-based testing or maintenance) will maintain one Lookout.

(D) Minimally manned vessels conducting hull-mounted mid-frequency testing will employ one Lookout.

(E) Ships, small boats, range craft, or aircraft conducting non-hull-mounted mid-frequency active sonar, such as helicopter dipping sonar systems, will maintain one Lookout.

(F) Surface ships or aircraft conducting high-frequency or non-hull-mounted mid-frequency active sonar activities associated with anti-submarine warfare and mine warfare activities at sea will have one Lookout.

(iv) Lookout measures for impulsive sound (e.g., explosives):

(A) Aircraft conducting improved extended echo ranging sonobuoy activities will have one Lookout.

(B) Aircraft conducting explosive sonobuoy activities using >0.5 to 2.5-lb net explosive weight (NEW) will have one Lookout.

(C) General mine countermeasure and neutralization activities involving positive control diver placed charges using >0.5 to 2.5 lb NEW will have a total of two Lookouts (one Lookout positioned in each of the two support vessels). All divers placing the

charges on mines will support the Lookouts while performing their regular duties. The divers and Lookouts will report all marine mammal sightings to their dive support vessel.

(D) Surface vessels or aircraft conducting small-,medium-, and large-caliber gunnery exercises will have one Lookout. Towing vessels, if applicable, will also maintain one Lookout.

(E) Aircraft conducting missile exercises against a surface target will have one Lookout.

(F) Aircraft conducting explosive bombing exercises will have one Lookout and any surface vessels involved will have trained Lookouts.

(G) During explosive torpedo testing from aircraft one Lookout will be used and positioned in an aircraft. During explosive torpedo testing from a surface ship the Lookout procedures implemented for hull-mounted mid-frequency active sonar activities will be used.

(H) To mitigate effects from weapon firing noise, ships conducting explosive and non-explosive large-caliber gunnery exercises will have one Lookout. This may be the same Lookout used for small, medium, and large-caliber gunnery exercises using a surface target when that activity is conducted from a ship against a surface target.

(v) Lookout measures for physical strike and disturbance:

(A) While underway, surface ships and range craft will have at least one Lookout.

(B) During activities using towed in-water devices towed from a manned platform, one Lookout will be used. During activities in which in-water devices are towed by unmanned platforms, a manned escort vessel will be included and one Lookout will be employed.

(C) Activities involving non-explosive practice munitions (e.g., small-, medium-, and large-caliber gunnery exercises) using a surface target will have one Lookout.

(D) During non-explosive bombing exercises one Lookout will be positioned in an aircraft and trained Lookouts will be positioned in any surface vessels involved.

(2) *Mitigation zones* – The following are protective measures concerning the implementation of mitigation zones.

(i) Mitigation zones will be measured as the radius from a source and represent a distance to be monitored.

(ii) Visual detections of marine mammals (or sea turtles) within a mitigation zone will be communicated immediately to a watch station for information dissemination and appropriate action.

(iii) Mitigation zones for non-impulsive sound:

(A) The Navy shall ensure that hull-mounted mid-frequency active sonar transmission levels are limited to at least 6 dB below normal operating levels if any detected marine mammals (or sea turtles) are within 1,000 yd. (914 m) of the sonar dome (the bow).

(B) The Navy shall ensure that hull-mounted mid-frequency active sonar transmissions are limited to at least 10 dB below the equipment's normal operating level if any detected marine mammals (or sea turtles) are within 500 yd. (457 m) of the sonar dome.

(C) The Navy shall ensure that hull-mounted mid-frequency active sonar transmissions are ceased if any detected cetaceans (or sea turtles) are within 200 yd. (183 m) and pinnipeds are within 100 yd. (91 m) of the sonar dome. Transmissions will not

resume until the marine mammal has been observed exiting the mitigation zone, is thought to have exited the mitigation zone based on its course and speed, has not been detected for 30 minutes, the vessel has transited more than 2,000 yd. beyond the location of the last detection, or the Lookout concludes that dolphins are deliberately closing in on the ship to ride the ship's bow wave (and there are no other marine mammal sightings within the mitigation zone). Active transmission may resume when dolphins are bow riding because they are out of the main transmission axis of the active sonar while in the shallow-wave area of the ship bow. The pinniped mitigation zone does not apply to pierside sonar in the vicinity of pinnipeds hauled out on or in the water near man-made structures and vessels.

(D) The Navy shall ensure that low-frequency active sonar transmission levels are ceased if any detected cetaceans (or sea turtles) are within 200 yd. (183 m) and pinnipeds are within 100 yd. (91 m) of the source. Transmissions will not resume until the marine mammal has been observed exiting the mitigation zone, is thought to have exited the mitigation zone based on its course and speed, has not been detected for 30 minutes, or the vessel has transited more than 2,000 yd. beyond the location of the last detection. The pinniped mitigation zone does not apply for pierside sonar in the vicinity of pinnipeds hauled out on or in the water near man-made structures and vessels.

(E) For training, the Navy shall ensure that high-frequency and non-hull-mounted mid-frequency active sonar transmission levels are ceased if any detected marine mammals are within 200 yd. (183 m) of the source. For testing, the Navy shall ensure that high-frequency and non-hull-mounted mid-frequency active sonar transmission levels are ceased if any detected cetaceans are within 200 yd. (183 m) and pinnipeds are

within 100 yd. (91 m) of the source. Transmissions will not resume until the marine mammal has been observed exiting the mitigation zone, is thought to have exited the mitigation zone based on its course and speed, the mitigation zone has been clear from any additional sightings for a period of 10 minutes for an aircraft-deployed source, the mitigation zone has been clear from any additional sightings for a period of 30 minutes for a vessel-deployed source, the vessel or aircraft has repositioned itself more than 400 yd. (370 m) away from the location of the last sighting, or the vessel concludes that dolphins are deliberately closing in to ride the vessel's bow wave (and there are no other marine mammal sightings within the mitigation zone). The pinniped mitigation zone does not apply for pierside or shore-based testing in the vicinity of pinnipeds hauled out on or in the water near man-made structures and vessels.

(iv) Mitigation zones and procedures for explosive and impulsive sound:

(A) For activities using IEER sonobuoys, mitigation will include pre-exercise aerial observation and passive acoustic monitoring, which will begin 30 minutes before the first source/receiver pair detonation and continue throughout the duration of the exercise. IEER sonobuoys will not be deployed if concentrations of floating vegetation (kelp paddies) are observed in the mitigation zone around the intended deployment location. Explosive detonations will cease if a marine mammal, sea turtle, or concentrations of floating vegetation are sighted within a 600-yd. (549 m) mitigation zone. Detonations will recommence if the animal is observed exiting the mitigation zone, the animal is thought to have exited the mitigation zone based on its course and speed, or the mitigation zone has been clear from any additional sightings for a period of 30 minutes.

(B) A mitigation zone with a radius of 350 yd. (320 m) shall be established for explosive signal underwater sonobuoys using >0.5 to 2.5 lb net explosive weight. Mitigation will include pre-exercise aerial monitoring of the mitigation zone during deployment. Explosive SUS buoys will not be deployed if concentrations of floating vegetation (kelp paddies) are observed within the mitigation zone around the intended deployment location. A SUS detonation will cease if a marine mammal or sea turtle is sighted within the mitigation zone. Detonations will recommence if the animal is observed exiting the mitigation zone, the animal is thought to have exited the mitigation zone based on its course and speed, or the mitigation zone has been clear from any additional sightings for a period of 10 minutes.

(C) A mitigation zone with a radius of 400 yd. (366 m) shall be established for mine countermeasures and neutralization activities using positive control firing devices. For Demolition and Mine Countermeasures Operations, pre-exercise surveys shall be conducted within 30 minutes prior to the commencement of the scheduled explosive event. The survey may be conducted from the surface, by divers, or from the air, and personnel shall be alert to the presence of any marine mammal or sea turtle. Should a marine mammal or sea turtle be present within the survey area, the explosive event shall not be started until the animal voluntarily leaves the area. The Navy will ensure the area is clear of marine mammals for a full 30 minutes prior to initiating the explosive event. Explosive detonations will cease if a marine mammal is sighted in the water portion of the mitigation zone (i.e., not on shore). Detonations will recommence if the animal is observed exiting the mitigation zone, the animal is thought to have exited the mitigation

zone based on its course and speed, or the mitigation zone has been clear from any additional sightings for a period of 30 minutes.

(D) A mitigation zone with a radius of 200 yd. (183 m) shall be established for small- and medium-caliber gunnery exercises with a surface target. Vessels will observe the mitigation zone from the firing position. When aircraft are firing, the aircrew will maintain visual watch of the mitigation zone during the activity. The exercise will not commence if concentrations of floating vegetation (kelp paddies) are observed within the mitigation zone. Firing will cease if a marine mammal or sea turtle is sighted within the mitigation zone. Firing will recommence if the animal is observed exiting the mitigation zone, the animal is thought to have exited the mitigation zone based on its course and speed, the mitigation zone has been clear from any additional sightings for a period of 10 minutes for a firing aircraft, the mitigation zone has been clear from any additional sightings for a period of 30 minutes for a firing ship, or the intended target location has been repositioned more than 400 yd. (370 m) away from the location of the last sighting.

(E) A mitigation zone with a radius of 600 yd. (549 m) shall be established for large-caliber gunnery exercises with a surface target. Ships will observe the mitigation zone from the firing position. The exercise will not commence if concentrations of floating vegetation (kelp paddies) are observed in the mitigation zone. Firing will cease if a marine mammal or sea turtle is sighted within the mitigation zone. Firing will recommence if the animal is observed exiting the mitigation zone, the animal is thought to have exited the mitigation zone based on its course and speed, or the mitigation zone has been clear from any additional sightings for a period of 30 minutes.

(F) A mitigation zone with a radius of 2,000 yd. (1.8 km) shall be established for missile exercises up to 500 lb NEW using a surface target. When aircraft are involved in the missile firing, mitigation will include visual observation by the aircrew prior to commencement of the activity within a mitigation zone of 2,000 yd. (1.8 km) around the intended impact location. The exercise will not commence if concentrations of floating vegetation (kelp paddies) are observed in the mitigation zone. Firing will not commence or will cease if a marine mammal or sea turtle is sighted within the mitigation zone. Firing will recommence if the animal is observed exiting the mitigation zone, the animal is thought to have exited the mitigation zone based on its course and speed, or the mitigation zone has been clear from any additional sightings for a period of 10 minutes or 30 minutes (depending on aircraft type).

(G) A mitigation zone with a radius of 2,500 yd. (2.3 km) for explosive bombs and a mitigation zone of 1,000 yd (914 m) for non-explosive bombs around the intended impact location shall be established for bombing exercises. Aircraft shall visually survey the target and buffer zone for marine mammals prior to and during the exercise. The exercise will not commence if concentrations of floating vegetation (kelp paddies) are observed in the mitigation zone. Bombing will not commence or will cease if a marine mammal or sea turtle is sighted within the mitigation zone. Bombing will recommence if the animal is observed exiting the mitigation zone, the animal is thought to have exited the mitigation zone based on its course and speed, or the mitigation zone has been clear from any additional sightings for a period of 10 minutes.

(H) A mitigation zone with a radius of 2,100 yd. (1.9 km) shall be established for torpedo (explosive) testing. Mitigation will include visual observation by aircraft

immediately before, during, and after the event of the mitigation zone. The exercise will not commence if concentrations of floating vegetation (kelp paddies) are sighted within the mitigation zone. Firing will not commence or will cease if a marine mammal, sea turtle, or aggregation of jellyfish is sighted within the mitigation zone. Firing will recommence if the animal is observed exiting the mitigation zone, the animal is thought to have exited the mitigation zone based on its course and speed, or the mitigation zone has been clear from any additional sightings for a period of 10 minutes or 30 minutes (depending on aircraft type). In addition to visual observation, passive acoustic monitoring shall be conducted by Navy assets, such as passive ship sonar systems or sonobuoys already participating in the activity. These assets would only detect vocalizing marine mammals within the frequency band monitored by Navy personnel. Passive acoustic detections would not provide range or bearing to detected animals, and therefore cannot provide locations of these animals. Passive acoustic detections shall be reported to the Lookout posted in the aircraft in order to increase vigilance of the visual surveillance, and to the person in control of the activity for their consideration in determining when the mitigation zone is determined free of visible marine mammals.

(I) A mitigation zone with a radius of 70 yd. (46 m) within 30 degrees on either side of the gun target line on the firing side shall be established for weapons firing noise during large-caliber gunnery exercises. Mitigation shall include visual observation immediately before and during the exercise. The exercise will not commence if concentrations of floating vegetation (kelp paddies) are observed in the mitigation zone. Firing will cease if a marine mammal or sea turtle is sighted within the mitigation zone. Firing will recommence if the animal is observed exiting the mitigation zone, the animal

is thought to have exited the mitigation zone based on its course and speed, the mitigation zone has been clear from any additional sightings for a period of 30 minutes, or the vessel has repositioned itself more than 140 yd. (128 m) away from the location of the last sighting.

(v) Mitigation zones for vessels and in-water devices:

(A) For all training activities and for testing activities involving surface ships, vessels shall avoid approaching marine mammals head on and shall maneuver to keep at least 500 yd. (457 m) away from observed whales and 200 yd (183 m) away from all other marine mammals (except bow riding dolphins, and pinnipeds hauled out on man-made navigational and port structures and vessels) during vessel movements. These requirements shall not apply if a vessel's safety is threatened and to the extent that vessels are restricted in their ability to maneuver. Restricted maneuverability includes, but is not limited to, situations when vessels are engaged in dredging, submerged activities, launching and recovering aircraft or landing craft, minesweeping activities, replenishment while underway and towing activities that severely restrict a vessel's ability to deviate course.

(B) For testing activities not involving surface ships (e.g. range craft) vessels shall maneuver to keep at least 100 yd. (91 m) away from marine mammals (except bow-riding dolphins, pinnipeds hauled out on man-made navigational and port structures and vessels, and pinnipeds during test body retrieval) during vessel movements. This requirement shall not apply if a vessel's safety is threatened and to the extent that vessels are restricted in their ability to maneuver. Restricted maneuverability includes, but is not limited to, situations when vessels are engaged in dredging, submerged activities, launching and

recovering aircraft or landing craft, minesweeping activities, replenishment while underway and towing activities that severely restrict a vessel's ability to deviate course.

(C) The Navy shall ensure that towed in-water devices being towed from manned platforms avoid coming within a mitigation zone of 250 yd. (230 m) for all training events and testing activities involving surface ships, and a mitigation zone of 100 yd (91 m) for testing activities not involving surface ships (e.g. range craft) around any observed marine mammal, providing it is safe to do so.

(vi) Mitigation zones for non-explosive practice munitions:

(A) A mitigation zone of 200 yd. (183 m) shall be established for small-, medium, and large-caliber gunnery exercises using a surface target. Mitigation will include visual observation from a vessel or aircraft immediately before and during the exercise within the mitigation zone of the intended impact location. The exercise will not commence if concentrations of floating vegetation (kelp paddies) are observed in the mitigation zone. Firing will cease if a marine mammal is sighted within the mitigation zone. Firing will recommence if the animal is observed exiting the mitigation zone, the animal is thought to have exited the mitigation zone based on its course and speed, the mitigation zone has been clear from any additional sightings for a period of 10 minutes for a firing aircraft, the mitigation zone has been clear from any additional sightings for a period of 30 minutes for a firing ship, or the intended target location has been repositioned more than 400 yd. (370 m) away from the location of the last sighting.

(B) A mitigation zone of 1,000 yd. (914 m) shall be established for non-explosive bombing exercises. Mitigation shall include visual observation from the aircraft immediately before the exercise and during target approach within the mitigation zone

around the intended impact location. The exercise will not commence if concentrations of floating vegetation (kelp paddies) are observed within the mitigation zone. Bombing will not commence or will cease if a marine mammal is sighted within the mitigation zone. Bombing will recommence if the animal is observed exiting the mitigation zone, the animal is thought to have exited the mitigation zone based on its course and speed, or the mitigation zone has been clear from any additional sightings for a period of 10 minutes.

(3) *NWTT-Specific Mitigation* – The following are additional measures the Navy shall comply with when conducting training or testing activities in the NWTT Study Area:

(i) Maritime Homeland Defense/Security Mine Countermeasure Integrated Exercises – The Navy shall conduct pre-event planning and training to ensure environmental awareness of all exercise participants. When this event is proposed to be conducted in Puget Sound, Navy event planners shall consult with Navy biologists who shall contact NMFS during the planning process in order to determine likelihood of gray whale or southern resident killer whale presence in the proposed exercise area as planners consider specifics of the event.

(ii) Small Boat Attack Gunnery Exercises - The Navy shall conduct pre-event planning and training to ensure environmental awareness of all exercise participants. When this event is proposed to be conducted in and around Naval Station Everett, Naval Base Kitsap Bangor, or Naval Base Kitsap Bremerton in Puget Sound, Navy event planners shall consult with Navy biologists who shall contact NMFS early in the planning process in order to determine the extent marine mammals may be present in the

immediate vicinity of the proposed exercise area as planners consider the specifics of the event.

(iii) Missile Exercise - The Navy shall conduct Missile Exercises using high explosives at least 50 nm from shore in the NWTT Offshore Area.

(iv) BOMBEX – The Navy shall conduct BOMBEX (high explosive munitions) greater than 50 nm from shore.

(v) BOMBEX (non-explosive practice munitions) - The Navy shall conduct BOMBEX (non-explosive practice munitions) events at least 20 nm from shore and shall not conduct BOMBEX events within the Olympic Coast National Marine Sanctuary.

(vi) Mine Countermeasure and Neutralization Underwater Detonations – The Navy shall require approval from U.S. Third Fleet prior to conducting mine countermeasure and neutralization underwater detonations at Hood Canal or Crescent Harbor.

(vii) Hull Mounted Mid-Frequency Active Sonar Training - The Navy shall require approval from U.S. Pacific Fleet’s designated authority prior to conducting hull-mounted mid-frequency active sonar on vessels while training underway in Puget Sound and the Strait of Juan de Fuca.

(viii) Pierside Maintenance or Testing of Sonar Systems – The Navy shall require approval from U.S. Pacific Fleet's designated authority or Systems Command designated authority (as applicable to ship and submarine active sonar use) prior to conducting pierside maintenance or testing in Puget Sound or the Strait of Juan de Fuca.

(b) [Reserved]

§ 218.145 Requirements for monitoring and reporting.

(a) The Navy is required to cooperate with the NMFS, and any other Federal, state or local agency monitoring the impacts of the activity on marine mammals.

(b) General Notification of Injured or Dead Marine Mammals - Navy personnel shall ensure that NMFS is notified immediately (or as soon as clearance procedures allow) if an injured, stranded, or dead marine mammal is found during or shortly after, and in the vicinity of, any Navy training exercise utilizing MFAS, HFAS, or underwater explosive detonations. The Navy will provide NMFS with species or description of the animal (s), the condition of the animal(s) (including carcass condition if the animal is dead), location, time of first discovery, observed behaviors (if alive), and photo or video (if available). In the event that an injured, stranded, or dead marine mammal is found by the Navy that is not in the vicinity of, or during or shortly after, MFAS, HFAS, or underwater explosive detonations, the Navy will report the same information as listed above as soon as operationally feasible and clearance procedures allow.

(c) General Notification of Ship Strike - In the event of a ship strike by any Navy vessel, at any time or place, the Navy shall do the following:

(1) Immediately report to NMFS the species identification (if known), location (lat/long) of the animal (or the strike if the animal has disappeared), and whether the animal is alive or dead (or unknown), and the time of the strike.

(2) Report to NMFS as soon as operationally feasible the size and length of animal, an estimate of the injury status (ex., dead, injured but alive, injured and moving, unknown, etc.), vessel class/type and operational status.

(3) Report to NMFS the vessel length, speed, and heading as soon as feasible.

(4) Provide NMFS a photo or video, if equipment is available

(5) Within 2 weeks of the strike, provide NMFS with a detailed description of the specific actions of the vessel in the 30-minute timeframe immediately preceding the strike, during the event, and immediately after the strike (e.g., the speed and changes in speed, the direction and changes in direction, other maneuvers, sonar use, etc., if not classified); a narrative description of marine mammal sightings during the event and immediately after, and any information as to sightings prior to the strike, if available; and use established Navy shipboard procedures to make a camera available to attempt to capture photographs following a ship strike.

(d) Event Communication Plan - The Navy shall develop a communication plan that will include all of the communication protocols (phone trees, etc.) and associated contact information required for NMFS and the Navy to carry out the necessary expeditious communication required in the event of a stranding or ship strike, including as described in the proposed notification measures above.

(e) The Navy must conduct all monitoring and/or research required under the Letter of Authorization including abiding by the NWTT monitoring plan. (*http://www.nmfs.noaa.gov/pr/permits/incidental/military.htm*).

(f) Annual NWTT Monitoring Report - The Navy shall submit an annual report of the NWTT monitoring describing the implementation and results of the NWTT monitoring efforts from the previous calendar year. Data collection methods will be standardized across range complexes and study areas to allow for comparison in different geographic locations. Although additional information will be gathered, the protected species observers collecting marine mammal data pursuant to the NWTT monitoring plan shall, at a minimum, provide the same marine mammal observation data required in §

218.145. The report shall be submitted either 90 days after the calendar year, or 90 days after the conclusion of the monitoring year to be determined by the Adaptive Management process. The NWTT Monitoring Report may be provided to NMFS within a larger report that includes the required Monitoring Plan reports from multiple range complexes and study areas (the multi-Range Complex Annual Monitoring Report). Such a report would describe progress of knowledge made with respect to monitoring plan study questions across all Navy ranges associated with the Integrated Comprehensive Monitoring Program. Similar study questions shall be treated together so that progress on each topic shall be summarized across all Navy ranges. The report need not include analyses and content that does not provide direct assessment of cumulative progress on the monitoring plan study questions.

(g) Annual NWTT Exercise and Testing Reports - The Navy shall submit preliminary reports detailing the status of authorized sound sources within 21 days after the anniversary of the date of issuance of the LOA. The Navy shall submit detailed reports 3 months after the annual anniversary of the date of issuance of the LOA. The detailed annual reports shall describe the level of training and testing conducted during the reporting period, and a summary of sound sources used (total annual hours or quantity [per the LOA] of each bin of sonar or other non-impulsive source; total annual number of each type of explosive exercises; total annual expended/detonated rounds [missiles, bombs, etc.] for each explosive bin; and improved Extended Echo-Ranging System (IEER)/sonobuoy summary, including total number of IEER events conducted in the Study Area, total expended/detonated rounds (buoys), and total number of self-scuttled IEER rounds. The analysis in the detailed reports will be based on the accumulation of

data from the current year's report and data collected from previous reports. The annual classified exercise reports will also include the amount of hull-mounted mid-frequency and high frequency active sonar use during training and testing activities in the Olympic Coast National Marine Sanctuary and in the months specified for the following three feeding areas (to the extent that active sonar training or testing does occur in these areas): the Humpback Whale Northern Washington feeding area (May through November); the Stonewall and Heceta Bank feeding area (May through November) and the Gray Whale Northern Puget Sound Feeding Area (March through May).

(h) 5-year Close-out Exercise and Testing Report—This report will be included as part of the 2020 annual exercise or testing report. This report will provide the annual totals for each sound source bin with a comparison to the annual allowance and the 5-year total for each sound source bin with a comparison to the 5-year allowance. Additionally, if there were any changes to the sound source allowance, this report will include a discussion of why the change was made and include the analysis to support how the change did or did not result in a change in the EIS and final rule determinations. The report will be submitted 3 months after the expiration of the rule. NMFS will submit comments on the draft close-out report, if any, within 3 months of receipt. The report will be considered final after the Navy has addressed NMFS' comments, or 3 months after the submittal of the draft if NMFS does not provide comments.

§ 218.146 Applications for Letters of Authorization.

To incidentally take marine mammals pursuant to the regulations in this subpart, the U.S. citizen (as defined by § 216.106) conducting the activity identified in §

218.140(c) (the U.S. Navy) must apply for and obtain either an initial LOA in accordance with § 218.147 or a renewal under § 218.148.

§ 218.147 Letters of Authorization.

(a) An LOA, unless suspended or revoked, will be valid for a period of time not to exceed the period of validity of this subpart.

(b) Each LOA will set forth:

(1) Permissible methods of incidental taking;

(2) Means of effecting the least practicable adverse impact on the species, its habitat, and on the availability of the species for subsistence uses (i.e., mitigation); and

(3) Requirements for mitigation, monitoring and reporting.

(c) Issuance, modification, or renewals of LOAs will be based on a determination that the total number of marine mammals taken by the activity as a whole will have no more than a negligible impact on the affected species or stock of marine mammal(s).

§ 218.148 Renewals and Modifications of Letters of Authorization and Adaptive Management.

(a) A Letter of Authorization issued under §§ 216.106 and 218.147 of this chapter for the activity identified in § 218.140(c) will be renewed or modified upon request of the applicant, provided that:

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

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

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

(c) An LOA issued under § 216.106 and § 218.147 of this chapter for the activity identified in § 218.144 of this chapter may be modified by NMFS under the following circumstances:

(1) Adaptive Management – NMFS may modify (including add to, change, or remove) the existing mitigation, monitoring, or reporting measures (after consulting with the Navy regarding the practicability of the modifications) if doing so creates a reasonable likelihood of more effectively accomplishing the goals of the mitigation and monitoring set forth in the preamble for these regulations.

(i) Possible sources of data that could contribute to the decision to modify the mitigation, monitoring, and reporting measures in an LOA include (but are not limited to):

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

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

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

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

(2) Emergencies – If NMFS determines that an emergency exists that poses a significant risk to the well-being of the species or stocks of marine mammals specified in § 218.142(c), an LOA may be modified without prior notification and an opportunity for public comment. Notification would be published in the **Federal Register** within 30 days of the action